Town of Surfside
Town Commission Meeting
AGENDA
SUPPLEMENTAL # 1
February 12, 2013
7 p.m.
Town Hall Commission Chambers - 9293 Harding Ave, 2nd Floor
Surfside, FL 33154

1. **Opening**
   - A. **Call to Order**
   - B. **Roll Call of Members**
   - C. **Pledge of Allegiance**
   - D. **Mayor and Commission Remarks** – Mayor Daniel Dietch
   - E. **Agenda and Order of Business** Additions, deletions and linkages
   - F. **Community Notes** – Mayor Daniel Dietch
   - G. **Employee of the Quarter – Dina Goldstein and Alfred Cooper** – Roger M. Carlton, Town Manager
   - H. **Officer of the Month of October 2012 – Sgt. Jose Pacheco and Officer Lesmes Ruiz** Chief of Police David Allen
   - I. **Officer of the Month of November 2012 - Officer Craig Lovellette** – Chief of Police David Allen
   - J. **Civilian of the Month of December 2012 – Executive Assistant Dina Goldstein** – Chief of Police David Allen
   - K. **Officer of the Year – To be announced** – Chief of Police David Allen
   - L. **Civilian of the Year – To be announced** – Chief of Police David Allen
   - M. **Recognition of Feral Cat Program Volunteers** – Executive Assistant Dina Goldstein
   - N. **Rescue Board Presentation designed by Mr. Guy Esten and donated by the Filiberto Family** – Mayor Daniel Dietch
   - O. **Recognition to Bay Harbor Elementary Students Cameron Behar and Kailani Barreras** – Commissioner Michelle Kligman

2. **Quasi-Judicial Hearings (None)**

3. **Consent Agenda** ***(Set for approximately 7:30 p.m.)***

   All items on the consent agenda are considered routine or status reports by the Town Commission and will be approved by one motion. Any Commission member may request, during item 1E Agenda and Order of Business, that an item be removed from the Consent Agenda and discussed separately.

Recommended Motion: To approve all consent agenda items as presented below.

**** Denotes agenda items as "must haves" which means there will be significant impacts if the item is not addressed tonight. If these items have not been heard by 10 p.m., the order of the agenda will be changed to allow them to be heard.***

A. **Minutes – (None)**
B. **Budget to Actual Summary as of November 30, 2012** – Donald Nelson, Finance Director **Page 1-3**
*C. **Town Manager's Report (Points of Light)** – Roger M. Carlton, Town Manager **Page 4 - 26**
*D. **Town Attorney's Report** – Linda Miller, Interim Town Attorney **Page 27 - 32**
*E. **Projects Progress Report** – Calvin, Giordano and Associates, Inc. **Page 33 - 35**
F. **Committee Reports** – Roger M. Carlton, Town Manager *(Note: Vice Mayor Karukin has requested that Committee minutes appear on the Consent Agenda. The most recent approved minutes have been included)* **Page 36 - 40**
- **November 28, 2012 Downtown Advisory Committee Minutes**
- **December 3, 2012 Tourist Board Minutes**

4. **Ordinances**

(Set for approximately 9:00 p.m.) (Note: Good and Welfare must begin at 8:15)

A. **Second Readings (Ordinances and Public Hearing)**

*1. **Amendment to Short Term Rental Ordinance to Allow for Alternative Notice and Amendment to Paragraph References** – Linda Miller, Interim Town Attorney **Page 41 - 45**

AN ORDINANCE OF THE TOWN COMMISSION OF THE TOWN OF SURFSIDE, FLORIDA AMENDING CHAPTER 90 "ZONING" AND SPECIFICALLY AMENDING SECTION 90-41.1 "SHORT TERM RENTAL OF SINGLE FAMILY DWELLINGS, TWO-FAMILY DWELLINGS, MULTI-FAMILY DWELLINGS AND TOWNHOUSES" OF THE TOWN OF SURFSIDE CODE OF ORDINANCES PROVIDING FOR INCLUSION IN THE CODE; REPEALING ALL ORDINANCES OR PARTS OF ORDINANCES IN CONFLICT HEREWITH; AND PROVIDING FOR AN EFFECTIVE DATE.

(Set for approximately _____ p.m.) (Note: Good and Welfare must begin at 8:15)

B. **First Reading Ordinances**

5. Resolutions and Proclamations
(Set for approximately 9:15 p.m.) (Note: Depends upon length of Good and Welfare)

***A. Red Light Camera Legislative Urging** – Mayor Daniel Dietch **Page 46 - 48**

A RESOLUTION OF THE TOWN COMMISSION OF THE TOWN OF SURFSIDE, FLORIDA, URGING THE HONORABLE GOVERNOR AND THE STATE OF FLORIDA LEGISLATURE TO REQUIRE PEDESTRIAN SIGNAL LIGHTS WITH A NUMERIC COUNTDOWN FEATURE AT ANY INTERSECTION WHERE A RED LIGHT CAMERA IS INSTALLED; PROVIDING FOR DIRECTION; PROVIDING FOR AN EFFECTIVE DATE.

***B Employment Offer Letter** – Commissioner Michelle Kligman **Page 49 - 52**

A RESOLUTION OF THE TOWN COMMISSION OF THE TOWN OF SURFSIDE, FLORIDA, APPROVING THE EMPLOYMENT OF LINDA MILLER AS INTERIM TOWN ATTORNEY PURSUANT TO THE FEBRUARY __ EMPLOYMENT OFFER LETTER; AND PROVIDING FOR AN EFFECTIVE DATE.

***C. Bullying** – Commissioner Michelle Kligman **Page 53 - 57**

A RESOLUTION OF THE TOWN COMMISSION OF THE TOWN OF SURFSIDE, FLORIDA ("TOWN"), ADOPTING AN ANTI-BULLYING POLICY THAT ESTABLISHES AN AWARENESS CAMPAIGN AND REPORTING SYSTEM FOR BULLYING, HARASSMENT, AND INTIMIDATION OF CHILDREN IN COMMUNITY FACILITIES; REQUIRING THE TOWN PARKS AND RECREATION DEPARTMENT IN COLLABORATION WITH THE TOWN PARKS AND RECREATION COMMITTEE TO CREATE A PROGRAM OF EDUCATION AND REPORTING, TO PREVENT BULLYING IN THE TOWN'S COMMUNITY FACILITIES; AND REQUESTING SURROUNDING COMMUNITIES JOIN IN SUCH EFFORTS AND TO ESTABLISH A COLLABORATIVE INITIATIVE THROUGH AN INTERLOCAL BOARD TO DEVELOP AND IMPLEMENT AN AWARENESS CAMPAIGN AND ANTI-BULLYING POLICY; PROVIDING FOR AUTHORIZATION; PROVIDING AN FOR EFFECTIVE DATE.

***D. Work Order Awards to C3TS/Stantec for Design of Harding Avenue Improvements** – Roger M. Carlton, Town Manager **Page 58 - 80**

A RESOLUTION OF THE TOWN COMMISSION OF THE TOWN OF SURFSIDE, FLORIDA, AUTHORIZING EXPENDITURE NOT TO EXCEED $57,500. TO STANTEC ARCHITECTURE INC., (FORMERLY C3TS) FOR A WORK ORDER ON THE STREETSCAPES IMPROVEMENTS PROJECT RENOVATING HARDING AVENUE FROM 96TH STREET TO 94TH STREET; PROVIDING FOR AUTHORIZATION; PROVIDING FOR AN EFFECTIVE DATE.

6. **Good and Welfare** ***(Set for approximately 8:15 p.m.)***
   Public comments for subjects or items not on the agenda. Public comment on agenda items will be allowed when agenda item is discussed by the Commission.

7. **Town Manager and Town Attorney Reports**
   Town Manager and Town Attorney Reports have been moved to the Consent Agenda – Item 3.
   All items on the Consent Agenda are considered routine or status reports by the Town Commission and will be approved by one motion. Any Commission member may request, during item 1E Agenda and Order of Business, that an item be removed from the consent agenda and discussed separately.

8. **Unfinished Business and New Business**

9. **Mayor, Commission and Staff Communications**

   A. Request for Funding Assistance for Ruth K. Broad K-8 Center: Recreational Facilities – Roger M. Carlton, Town Manager **(TIME CERTAIN AT 7:45 PM) Page 81 - 91**

   B. Traffic Study (Please bring the Traffic Study book provided in December 2012) – Roger M. Carlton, Town Manager ***(Deferred by Town Manager to the March 12, 2013 Town Commission Meeting)***

   ***C. Utility Undergrounding- Recommendation for Discussion and Direction** - Roger M. Carlton, Town Manager **(TIME CERTAIN AT 8:00 PM) Page 92 – 208 New Commission Communication and corrected backup)**

   ***D. Additive Alternates to Utility Project – Decorative Street Signs**– John DiCenso, Interim Public Works Director **Page 209 - 215**

   E. Severance/Compensation – Commissioner Joe Graubart **Page 216**

***F. Confirmation of Candidates Short List for Interviews-** Roger M. Carlton, Town Manager **Page 217 – 220 New Status Report**

G. Town Calendar – Commissioner Joe Graubart **Page 221**

H. Commission Directive: Town Manager Short Term Priorities – Commissioner Joe Graubart **Page 222 - 228**

I. Required Clearance Clarification – Roger M, Carlton, Town Manager **Page 229 - 235**

10. Adjournment

Respectfully submitted,

Roger M. Carlton
Town Manager

THIS MEETING IS OPEN TO THE PUBLIC. IN ACCORDANCE WITH THE AMERICANS WITH DISABILITIES ACT OF 1990, ALL PERSONS ARE DISABLED; WHO NEED SPECIAL ACCOMMODATIONS TO PARTICIPATE IN THIS MEETING BECAUSE OF THAT DISABILITY SHOULD CONTACT THE OFFICE OF THE TOWN CLERK AT 305-893-6511 EXT. 226 NO LATER THAN FOUR DAYS PRIOR TO SUCH PROCEEDING. HEARING IMPAIRED PERSONS MAY CONTACT THE TDD LINE AT 305-893-7936.

IN ACCORDANCE WITH THE PROVISIONS OF SECTION 286.0105, FLORIDA STATUTES, ANYONE WISHING TO APPEAL ANY DECISION MADE BY THE TOWN OF SURFSIDE COMMISSION, WITH RESPECT TO ANY MATTER CONSIDERED AT THIS MEETING OR HEARING, WILL NEED A RECORD OF THE PROCEEDINGS AND FOR SUCH PURPOSE, MAY NEED TO ENSURE THAT A VERBATIM RECORD OF THE PROCEEDINGS IS MADE WHICH RECORD SHALL INCLUDE THE TESTIMONY AND EVIDENCE UPON WHICH THE APPEAL IS TO BE BASED.

AGENDA ITEMS MAY BE VIEWED AT THE OFFICE OF THE TOWN CLERK, TOWN OF SURFSIDE TOWN HALL, 9293 HARDING AVENUE. ANYONE WISHING TO OBTAIN A COPY OF ANY AGENDA ITEM SHOULD CONTACT THE TOWN CLERK AT 305-861-4863. A COMPLETE AGENDA PACKET IS ALSO AVAILABLE ON THE TOWN WEBSITE AT www.townofsurfsidefl.gov

TWO OR MORE MEMBERS OF OTHER TOWN BOARDS MAY ATTEND THIS MEETING.

THESE MEETINGS MAY BE CONDUCTED BY MEANS OF OR IN CONJUNCTION WITH COMMUNICATIONS MEDIA TECHNOLOGY, SPECIFICALLY, A TELEPHONE CONFERENCE CALL. THE LOCATION 9293 HARDING AVENUE, SURFSIDE, FL 33154, WHICH IS OPEN TO THE PUBLIC, SHALL SERVE AS AN ACCESS POINT FOR SUCH COMMUNICATION.

TOWN OF SURFSIDE
MEMORANDUM

DATE: February 12, 2013

TO: Mayor Daniel Dietch and Members of the Town Commission

FROM: Roger M. Carlton, Town Manager

SUBJECT: Fifth Update for the Undergrounding Utility Project

Recommendation: It is recommended that the Town Commission discuss this update, hear from the public and then determine if you wish to move the process forward subject to certain limitations. A decision of this nature will not be a final decision; it will just keep the process moving. The final decision will not be made until the Town Commission authorizes the documents with FPL and other utilities to be signed and until the loan necessary to fund the project is approved. That decision does not need to be made until a recommended special one topic meeting of the Town Commission is scheduled for late April, 2013.

Four of the five advertised and televised meetings for the undergrounding project were not well attended. The fifth meeting was attended by approximately twenty (20) people and many questions were asked and answered to the best of our ability. In addition a staff prepared FAQ was mailed to 3700 addresses (roughly the same number as the bills FPL sends out monthly) and the Town's and FPL's FAQ's have been posted on the website. Recent questions logically grouped are as follows:

Question: What is this project?
Answer: The complete undergrounding of all utilities currently above ground plus the required switches, transformers and other equipment which will be above ground some in water proof boxes.

Question: What will be above ground in front of my home?
Answer: It depends upon the final design by FPL and the cable and phone companies. The design will make every effort to reduce the visual impact of these "boxes" and every home will have an individual plan discussed with the owners just as we did with the water/sewer storm drainage project.

Question: What will it cost me to convert my home to the underground service.
Answer: There will be no cost to the homeowners to bring the service to the location of the electrical panel and hook up for phone and cable. There is an $1800 per home allocation to do this. Staff believes this will cover the cost on average for all homes, however, some will cost less and some will cost more. If the interior of the home needs upgrade to meet code, we will work with the homeowners to reduce cost through a pre-approved list of electrical contractors. If a homeowner is of provable limited means (definition to be determined by the Town Commission) a loan will be provided at low interest and a lien will be placed on the property to be paid when it is sold or substantially upgraded. This is very similar to the PACE program which the Town Commission is currently considering.

Question: How long will my home be out of service when the conversion occurs?
Answer: Since the entire new system is installed before the old is removed (three separate phases) the turnover should be very brief, perhaps a few hours. If someone has special medical needs an accommodation will be made including a generator if necessary.

Question: How does the Town pay for this?
Answer: A loan will be taken out for either 15 or 20 years. The FPL bills will have a $10-12 monthly surcharge for residential customers and $20-50 for commercial customers. The residential surcharge is fixed and limited by the PSC tariff.. The commercial customer surcharge is based on consumption, however, the $50.00 monthly surcharge is the maximum amount.

These are voluntary proffers from new developments which will contribute $700,000 to reduce construction cost. FPL reduces their cost by 25 percent for "hardening" the system.

Question: Is the financing certain at this point in time?
Answer: Not yet. Staff, bond, counsel, financial advisor and the Town Attorney have been working with FPL's top attorney for dealing with Public Services Commission (PSC) tariff matters to work out some new language that allows the surcharge revenues to be pledged. FPL has been supportive and it will be necessary to amend the tariff to clarify that the revenues can be pledged. The PSC will be approached in April, 2013 on the issue if the Town Commission determines to move forward during the February 12, 2013 meeting.

Question: What if the PSC declines to allow the surcharge to be pledged?
Answer: The financing approach can be amended to pledge the currently available $844,000 revenues from utility tax and franchise fees against the $600,000 annual debt service for the undergrounding project including principal and interest with the 20 year financing approach. The surcharge revenues are projected to be $475,000 during the first year which means that the surcharge revenue plus approximately $125,000 of the utility tax and franchise fees will cover the debt. As soon as the approved new buildings come on line, the increase in franchise fees and utility taxes will be more than sufficient to ensure that the existing utility tax and franchise fees are not necessary.

Question: Why are you looking at this alternate financing approach?
Answer: It is always wise when new financing concepts are being considered to have a back-up approval available.

Question: If we finance for 20 years how much interest will be required.
Answer: If the interest rate is approximately 3.25% total interest would be approximately $3.3 million. We have not approached the banks at this time to fix the rate.

Question: How conservative are your numbers and which of the three FPL estimates provides the least risk?
Answer: The first approach offered by FPL is the least risk. They build the entire system for a fixed price. When staff first analyzed this structure we did not include the one time cost of decorative street lights which is now included. The second and third alternatives reflect substantial reductions in the FPL cost if we take on more of the work using FPL approved contractors after competitive bids. This will save money and possibly lower the monthly surcharge, however, until prices are bid we have not lowered the monthly surcharge estimates.

Further, the $2 million estimated cost for the cable and phone undergrounding is a very conservative number and staff believes after consultation with officials of these two utilities that the cost will be less.

Question: What does all the financing discussion mean to the citizens of Surfside?
Answer: Staff recommends continued utilization of the $20-50 monthly commercial and the $10-12 residential estimates. These numbers will possibly be lowered as the interest cost is known and as the competitive bids for construction are sought. The surcharge does not start till the undergrounding is finished.

Question: How long will this construction take and when will it begin?
Answer: It will take at least 12-15 months to initiate construction. The Town will be divided into three zones as it was in the Water/Sewer/Storm drainage project and each zone will require approximately six months. We will not have to dig up the streets again as the conduit has been installed.

Question: The Town Manager is retiring and the Public Works Director has left. How will a project of this magnitude and complexity be managed.
Answer: Both the Town Manager and Public Works Director positions will be filled in the next few months. Randy Stokes has become a full time employee and will continue to manage the relationships with the homeowners in the extraordinary manner he did for the Water/Sewer/Storm drainage project. We have also met with Manny Rodriguez, FPL Miami Dade Regional Manager for External Affairs, who is an engineer soon to be retired with 43 years of FPL service, and he is willing to come on board to manage this project. His relationships with FPL and with the other utilities are exceptional. This team should allay any concerns with the "capacity to manage the project" question.

Question: What is the Administration asking the Town Commission to do during the February 12, 2013 meeting?
Answer:

1) Hear from the public, ask questions and determine if you want staff, financial advisor, bond counsel and Town Attorney to continue to move forward with the project.
2) Authorize the team described above to pursue the necessary tariff changes with FPL and with the PSC that allow the monthly surcharges to be pledged.
3) Request an extension of the April 27, 2013 date for making the final commitment to FPL to June 27, 2013.
4) Established the $10-12 as the maximum monthly residential surcharge and the $20-50 monthly surcharge as the maximum commercial surcharge so that staff, bond counsel, Town Attorney and financial advisor all know that this is the outer limit of the financing.
5) Clearly state that the financing decisions must come back to the Town Commission for approval.
6) Authorize discussions to begin with Manny Rodriguez to determine what his role would be to manage the project.
7) Authorize staff to retain an independent cost estimator with expertise in undergrounding to validate the cost estimates as an assurance that the various utility cost proposals are reasonable. That report would be available prior to the April, 2013 Town Commission meeting.
8) Hold one more special meeting during late April, 2013 to finalize the go/no go decision. By that time all the unknowns will be tied down to the greatest extent feasible.

Roger M. Carlton
Town Manager

Donald G. Nelson
Finance Director

Town of Surfside
Commission Communication

Agenda Item # 9C

Agenda Date: February 12, 2013

Subject: Utility Undergrounding – Recommendation for Discussion and Direction

Background: This is the fourth in a series of reports regarding the undergrounding project. The November and December, 2012 and January, 2013 reports appear as Attachment 1.

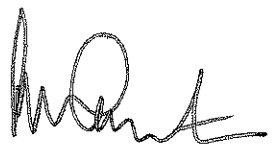
During the months of January and early February 2013, five (5) advertised (twice in *Neighbors*) and televised public meetings were held on the project. The attendance at four of these meetings was very limited, however, the project was fully explained to anyone watching on Channel 77 after attendee questions were answered. The fifth meeting was well attended and numerous questions were asked and answered.

Staff worked closely with the Town Attorney's office and bond counsel JoLinda Herring and financial advisor Sergio Masvidal to develop the first reading bond ordinance required to complete the loan process. During this process, a question arose regarding the PSC Tariff and how it allows or restricts pledging the MCGRUF revenues to the loan necessary to fund the project. Therefore, based on the thirty day extension granted by FPL, it is recommended that the February 12, 2013 Town Commission meeting be utilized to hear public input, receive answers to the best of Staff's and FPL's ability to any remaining questions and determine if the Town Commission still wants to move forward and under what circumstances. If the Town Commission reaches the conclusion to go forward a first reading of the ordinance would be scheduled for March 12, 2013 and second reading would be scheduled for April 9, 2013. The implications for the debt, the project total cost including interest and the pledges necessary can all be discussed with our financial advisor, Sergio Masvidal, and bond counsel, JoLinda Herring, during the February 12, 2013 Town Commission meeting. The implications of deferring the project relating to costs, interest rates and the FPL queue can also be discussed.

Staff has also worked with FPL to further lower the cost for the project. We are finalizing discussions with the cable and telephone providers to drive costs lower. This means that the low range of residential monthly cost could be $8 – 10 and the high range is $10 – 12. These numbers will be firm before the first reading. The level of responsibility for the Public Works Department will not ramp up for more than a year since the final planning, permitting, bidding, contract award will take at least that amount of time. The MCGRUF billing does not start until the new system is energized by zone.

The Town's Frequently Asked Questions, "FAQ's" was sent to more than 3700 addresses by mail during the first week of February, 2013 (Attachment 2) and the FPL FAQ's (Attachment 3) were both posted to the Town's website by February 5, 2013. Both of the FAQ's were posted on the website previously as part of the January 15, 2013 Agenda Packet We look forward to a lively discussion and receiving direction on the project.

One final comment. Due to the need to complete the agenda, a supplemental package regarding the undergrounding specifically answering additional questions will be sent as soon as possible.



Town Manager

Town of Surfside
Commission Communication

Agenda Item #: 9D

Agenda Date: January 15, 2013

Subject: FPL Undergrounding Status Report - Update

This month's status report is the third in a series. The November and December 2012 reports appear as Attachment 1 and 2.

Additional items for your review include:

Attachment 3A – G which are a variety of studies and recent articles analyzing the merits of undergrounding projects from a reliability standpoint and the relative differences of wind and flood protection. The Administration does not have the expertise to evaluate these and suggests that you review the documents and draw your own conclusions.

Attachment 4 is the quarter page advertisement which has appeared twice in the Miami Herald Neighbors announcing five televised public information meetings to discuss the project.

Attachment 5A and 5B are the Frequently Asked Questions (FAQs) that have been prepared by Staff (5A) for the Surfside specific project and by FPL (5B) for undergrounding projects in general. After the first public meeting which was held on January 10, 2013, the Surfside FAQs will be modified and a letter will be sent to all Surfside homeowners and businesses.

Attachment 6A – C reflects three different financing scenarios for the project. The cost per month for the residential units is estimated to be $10.00 to $12.00 and commercial customers would be $20 – $50 depending on consumption. These numbers will be finalized in February, 2013 to assist the final decision on the part of the Town Commission.

In summary, January, 2013 will be a month for public input and finalizing the costs. There are no decisions to be made by the Town Commission this month.

Roger M. Carlton, Town Manager

Bill Evans, Public Works Director

Donald Nelson, Finance Director

Town of Surfside
Commission Communication

Agenda Item #: 9C

Agenda Date: November 13, 2012

Subject: Undergrounding Utilities

Recommendation: It is recommended that the Town Commission authorize the retention of JoLinda Herring of Bryant Miller Olive and Sergio Masvidal with The Public Financial Management Group to assist Staff with studying the financing for the project to underground the electric, telephone and cable systems in all areas of the Town which are currently served above ground. It is further recommended that Staff be authorized to enter into discussions with AT&T and Atlantic Broadband to finalize cost estimates for their element of the project and bring back a comprehensive report for review during the December 11, 2012 Town Commission meeting.

Background: The Town Commission authorized Ric Man Construction to build our water/sewer/storm drainage system by adopting Resolution No. 11-2028 on June 14, 2011. This project included $300,000 to install conduit for future undergrounding of electric, cable, telephone and fiber optic in all locations where the street pavement would have to be crossed in the future if an undergrounding project were approved. Further, the Town Commission authorized the expenditure of $59,844 for FPL to prepare a binding cost estimate to complete the electric portion of the work.

Project Cost: The binding cost estimate (Attachment 1) was received on September 27, 2012 and has been analyzed by Staff. The cost estimate for the project is:

$7,486,221	Construction by FPL
(1,871,555)	Credit for "hardening the system"
$5,614,666	Construction cost by FPL
59,844	Credit for cost study (engineering deposit)
$5,554,822	Net construction cost by FPL
(1,800,000)	Savings if Town manages the construction with FPL approved contractors
$3,754,822	Net construction cost by Town
1,000,000	Cable TV undergrounding cost
1,000,000	AT&T undergrounding cost

700,000	VISTA waterproof electric transformers
645,482	Contingency and construction inspection
$7,100,304	Town cost for undergrounding all utilities
1,800,000	Estimated cost to bring power to all homes and commercial structures
$8,900,304	Total cost before voluntary proffers
(700,000)	Funds available from voluntary proffers from Surf Club ($300,000), Grand Beach ($185,000) and the Shul ($215,000)
$8,200,304	**Full estimated financing need for the project**

What does the Project include: The FPL project includes 267,685 feet (50 miles) of cable; 24 switch cabinets and 307 transformers. FPL will remove 470 poles and 278 overhead transformers.

The specific requirements for AT&T and Atlantic Broadband are not yet known, however, the cost estimates have been reasonably validated by both companies. If the Town Commission gives authority to continue analysis of the project, Staff will enter into discussions with AT&T and Atlantic Broadband to determine if they will fund any portion of the cost. We will also require AT&T to install the capability for U-verse. It is also possible that extending the term of the cable and telephone franchise agreements may result in some cost reduction.

How do we pay for this: There are a number of sources for financing including a competitive private placement like we used for the water/sewer/storm drainage project. There are also sources like the State Loan Pool administered by the Florida League of Cities. To select the best funding sources is the role of our financial advisor in conjunction with the Finance Director. It should be remembered that interest rates at this time are near all-time lows.

The source of repayment is authorized by the Mechanism for Governmental Recovery of Underground Fees (MGRUF) element of FPL's tariff (Attachment 2), which allows the placement of a 15 percent of the monthly bill not to exceed $30.00 per month addition on all residential units (estimated to be 2200 units) and $50 per month for every 5000 KW hours of consumption for commercial properties (38 buildings). This additional cost may be placed on the electric bill for up to 20 years. Staff is in the process of analyzing this revenue stream and believes that the monthly fee will be less than the maximum allowable and the full twenty years will not be required. If the Town Commission authorizes Staff to move forward with the analysis, much more refined estimates will be provided during the December 11, 2012 Town Commission meeting.

There is also the possibility of establishing a Coastal Barrier Infrastructure Financing District which must be approved by the voters. This approach will also be discussed at the December 11, 2012 Town Commission meeting.

Next steps: It is important to understand that the FPL binding cost estimate is only good until late March, 2013. If a decision is not reached by that date, the cost estimate becomes invalid and

FPL will require another $60,000 to update the estimate. Therefore the following calendar is recommended:

November, 2012 Town Commission meeting: Authorize the retention of Bryant Miller Olive and The Public Financial Management Group to serve as bond counsel and financial advisor. Establish a citizen's advisory committee similar to the water/sewer/storm drainage project and the parking structure advisory committee.

December, 2012 Town Commission meeting: Review full cost analysis including details from AT&T and Atlantic Broadband. Review detailed financing plan and resolve any issues related to fairness of funding procedures from single family, commercial and multi-family sources.

January, 2013 Town Commission meeting: Authorize a very significant public information campaign. Make a final determination that a series of public hearings will be held in February, 2013.

February, 2013: Hold a series of public hearings and attend condominium association board meetings. Inform all commercial property owners as well.

March, 2013: Make a final decision on the project and authorize the financing.

Project Implementation: The project will be built in three phases similar to the water/sewer/storm drainage project. The overall project is estimated to require nine months for conduit installation and six months to complete energizing all areas. Areas are energized by blocks as the system is installed and properties are served underground.

The Town will retain a group of electrical contractors to do the work on private property from the main line in the easement to the service on the property. In some cases the property may need or the owners may want to upgrade their service. That will be determined by the electrical contractor and Building Official in conjunction with the property owner and is expected to be a concern only to a very small number of properties. If the Town Commission wishes, the Town could provide financing in the case of demonstrable financial hardship and be repaid over time.

The cost of converting the AT&T and Atlantic Broadband systems from the easement to the home is much less than the electrical system. The same electrical contractors retained by the Town will do this work.

Hardening and Aesthetics: The benefits of hardening the system fall into three categories. The first is wind resistance for our nearly 75 year old electrical system. There is no question that wind resistance will be enhanced if the system goes underground. The second category is flood resistance. Suffice it to say that all bets are off if we have a tidal surge that covers the Town, however, the length of time to recover is greatly enhanced if the VISTA waterproof electric transformer boxes are used. Further, FPL's protocols for re-energizing after storms have clearly

shown that underground areas are brought up much faster than areas that require replacement of lines due to wind damage including fallen trees.

The aesthetics improvement of undergrounding is clear and cannot be questioned. While this may not be a priority for all residents, the improvement to property values when the project is complete helps to make the case.

Conclusion: Surfside has been considering undergrounding utilities for many years. The Town Commission has shown great foresight by providing the conduit for crossing the streets as an element of the water/sewer/storm drainage system and authorizing the FPL cost study. The data is now in and it is time to authorize the financial analysis as well as the process for citizen involvement.

This project will be a game changer of the magnitude of the Community Center and the water/sewer/storm/drainage project. The enormous benefit for hurricane recovery is clear. The financing is achievable, construction costs are very low and the team is in place to manage this project.

The Administration looks forward to receiving the Town Commission direction to allow the decision to be made within the timeframe proposed.

Bill Evans, Public Works Director

Roger M. Carlton, Town Manager

Donald Nelson, Finance Director

Florida Power & Light Company, 2455 Port West Blvd., West Palm Beach, FL 33407

FPL

September 27, 2012

Mr. Bill Evans
Public Works Director
Town of Surfside
9293 Harding Ave.
Surfside, FL 33154

Re: Town of Surfside
Electric Facilities Conversion
Entire Town Limits -Binding Cost Estimate
WR # -4269737, -4269749, -4269755

Dear Mr. Evans:

FPL welcomes the opportunity to assist you in determining if underground service is right for your area. As per your request, FPL has completed a binding cost estimate for the project designated as the Surfside Conversion project. The binding cost estimate amount, known as the Contribution In Aid of Construction (C.I.A.C.), required for converting the area to underground is $5,614,666.00. This amount is based on the proposed underground design inclusive of the Vista switch technologies as requested by the Town. The underground drawings for the project are being finalized and a full set will be sent to you once they are complete. In addition, the cost estimate includes a more than $ 4.8 million adjustment credit for both FPL's Government Adjustment Factor (G.A.F.) Waiver and as required in the C.I.A.C. formula, tariff Section 12.1, credit for an equivalent overhead system designed at the current hardened (i.e. extreme wind) standard. Further the cost assumes the following:

- Rapid trench construction
- All work will be performed during the daylight hours, Monday through Friday, 8 A.M. to 5 P.M.. Any after hours work, e.g. disconnect / reconnect service appointments, would be an additional expense for the Town.

This binding cost estimate is valid for 180 days and a response must be received within that timeframe. Should you agree to move forward with the project, please sign and return the enclosed documents. Once we receive the acceptance package (e.g. partially executed documents and C.I.A.C. payment), we will commence the construction process (i.e. initiate bid requests and material purchasing). Any deposits that you have already paid will be applied towards the C.I.A.C. and you must pay the remaining difference of $5,554,822.00 before we begin construction. Failure to execute the applicable Agreement and pay the C.I.A.C. specified in the Agreement within the 180 day time limit, or termination of the Agreement, shall result in the expiration of the binding cost estimate. However, if you choose to cancel your request or not respond in time, your engineering deposit will not be returned and the estimate will be withdrawn.

This estimate only includes the charges to be paid to FPL. There are additional costs which are the customer's responsibility and should also be considered. These potential costs include:

- Site restoration (sod, landscaping, pavement, sidewalks, etc).
- Rearrangement of customer electric service entrances (requires electrician) from overhead to underground. Also, additional customer expense if local inspecting authorities require customer wiring to be brought up to current codes.
- Removal and burial of other utilities (e.g. telecom, CATV, etc.).
- Any project scope changes that modify the enclosed drawings.
- Acquiring, describing, securing and recording of easements for underground facilities.

We look forward to working with you and your staff as this project progresses. If you have any questions, please contact me at 561-845-4624.

Sincerely,

John C. Lehr, Jr.
Project Manager – Underground
Distribution
FPL

Attachments

INSTALLATION OF UNDERGROUND ELECTRIC DISTRIBUTION FACILITIES FOR THE CONVERSION OF OVERHEAD ELECTRIC DISTRIBUTION FACILITIES

SECTION 12.1 DEFINITIONS

APPLICANT - Any person, corporation, or entity capable of complying with the requirements of this tariff that has made a written request for underground electric distribution facilities in accordance with this tariff.

CONVERSION - Any installation of underground electric distribution facilities where the underground facilities will be substituted for existing overhead electric distribution facilities, including relocations.

CONTRIBUTION-IN-AID-OF-CONSTRUCTION (CIAC) – The CIAC to be paid by an Applicant under this tariff section shall be the result of the following formula:

CIAC =

1) The estimated cost to install the requested underground facilities;
\+ 2) The estimated cost to remove the existing overhead facilities;
\+ 3) The net book value of the existing overhead facilities;
\- 4) The estimated cost that would be incurred to install new overhead facilities, in lieu of underground, to replace the existing overhead facilities (the "Hypothetical Overhead Facilities");
\- 5) The estimated salvage value of the existing overhead facilities to be removed;
\+ 6) The 30-year net present value of the estimated non-storm underground v. overhead operational costs differential, which is set at $0 (zero) per pole-line mile of the existing overhead facilities;
\- 7) The 30-year net present value of the estimated average Avoided Storm Restoration Costs ("ASRC") calculated as a percentage of the sum of lines 1) through 6). Simplified eligibility criteria for each ASRC Tier are summarized below. Applicants must enter into an Underground Facilities Conversion Agreement with the Company which provides full details on terms, conditions and compliance requirements.

Tier	Percentage	Pole-Line Miles	Customer Conversions	Completion
1 *	25%	3 or more	100%	3 phases
2	10%	1 to <3	100%	3 phases
3	5%	< 1	n/a	n/a

* The GAF Waiver will apply in lieu of Tier 1 ASRC for eligible conversions by Local Government Applicants.

GAF Waiver

For Applicants entering into an Underground Facilities Conversion Agreement – Governmental Adjustment Factor Waiver with the Company, the otherwise applicable CIAC amount, as calculated above, shall be reduced by the GAF Waiver. The amount of the GAF Waiver shall be calculated as follows:

GAF Waiver =

25% x the otherwise applicable CIAC;
\+ 75% x the ASRC (avoids double-counting the ASRC embedded in the otherwise applicable CIAC.)

If the Applicant elects to construct and install all or part of the underground facilities, then for purposes of calculating the ASRC or the GAF Waiver amount only, the otherwise applicable CIAC shall be adjusted to add FPL's estimated cost for the Applicant-performed work. In addition, the Direct Engineering, Supervision, and Support (DESS) costs associated with this Applicant-performed work will be reduced by 20% from the amount that would have applied if FPL performed this work.

DISTRIBUTION SYSTEM - Electric service facilities consisting of primary and secondary conductors, service drops, service laterals, conduits, transformers and necessary accessories and appurtenances for the furnishing of electric power at utilization voltage.

SERVICE FACILITIES - The entire length of conductors between the distribution source, including any conduit and or risers at a pole or other structure or from transformers, from which only one point of service will result, and the first point of connection to the service entrance conductors at a weatherhead, in a terminal, or meter box outside the building wall; the terminal or meter box; and the meter.

(Continued on Sheet No. 6.301)

(Continued from Sheet No. 6.300)

SECTION 12.2 GENERAL

12.2.1 Application

This tariff section applies to all requests for underground electric distribution facilities where the facilities requested will be substituted for existing overhead electric distribution facilities. Any person, corporation, or entity capable of complying with the requirements of this tariff may submit a request as follows. Requests shall be in writing and must specify in detail the overhead electric distribution facilities to be converted or the area to be served by underground electric distribution facilities in lieu of presently existing overhead electric distribution facilities serving said area. Upon receipt of a written request, FPL will determine the feasibility of converting the existing facilities, any necessary revisions to this written request, and the non-refundable deposit amount necessary to secure a binding cost estimate and notify the applicant of said amount.

12.2.2 Contribution-in-Aid-Of-Construction (CIAC)

Upon the payment of a non-refundable deposit by an Applicant, FPL shall prepare a binding cost estimate specifying the contribution in aid of construction (CIAC) required for the installation of the requested underground distribution facilities, where the installation of such facilities is feasible, and provide said estimate to the Applicant upon completion of the estimate along with either an Underground Facilities Conversion Agreement or an Underground Facilities Conversion Agreement - Governmental Adjustment Factor Waiver. The CIAC amount to be collected pursuant to a binding cost estimate from an Applicant shall not be increased by more than 10 percent of the binding cost estimate to account for actual costs incurred in excess of the binding cost estimate. However, the CIAC may be subject to increase or refund if the project scope is enlarged or reduced at the request of the Applicant, or the CIAC is found to have a material error prior to the commencement of construction. The binding cost estimate provided to an Applicant shall be considered expired if the Applicant does not enter into either an Underground Facilities Conversion Agreement or an Underground Facilities Conversion Agreement - Governmental Adjustment Factor Waiver and pay the CIAC amount specified for the installation of the requested underground electric distribution facilities within 180 days of delivery of the binding cost estimate to the Applicant by FPL.

(Continued on Sheet No. 6.310)

(Continued from Sheet No. 6.301)

12.2.3 Non-Refundable Deposits

The non-refundable deposit for a binding cost estimate for conversion to a direct buried cable in conduit underground electric distribution system shall be determined by multiplying the number of pole line feet of existing overhead electric distribution facilities to be converted by $1.20. The deposit must be paid to FPL to initiate the estimating process. The deposit will not be refundable, however, it will be applied in the calculation of the CIAC required for the installation of underground distribution facilities. The deposit and the preparation of a binding cost estimate are a prerequisite to the execution of either an Underground Facilities Conversion Agreement or an Underground Facilities Conversion Agreement - Governmental Adjustment Factor Waiver. If the request for underground electric distribution facilities involves the conversion of less than 250 pole line feet of existing overhead facilities, then no deposit will be required for a binding cost estimate, provided, however, that all other requirements of this tariff shall still apply.

12.2.4 Non-Binding Cost Estimates

Any person, corporation, or entity may request a non-binding cost estimate free of charge. The non-binding cost estimate shall be an order of magnitude estimate to assist the requestor in determining whether to go forward with a binding cost estimate. Neither an Underground Facilities Conversion Agreement nor an Underground Facilities Conversion Agreement - Governmental Adjustment Factor Waiver may be executed on the basis of a non-binding cost estimate.

12.2.5 Underground Facilities Conversion Agreement

Any Applicant seeking the installation of underground distribution facilities pursuant to a written request hereunder shall execute either the Underground Facilities Conversion Agreement set forth in this tariff at Sheet No. 9.720 or, if applicable, the Underground Facilities Conversion Agreement - Governmental Adjustment Factor Waiver set forth in this tariff at Sheet No. 9.725. The applicable Agreement must be executed and the CIAC paid by the Applicant within 180 days of the delivery of the binding cost estimate to the Applicant. Failure to execute the applicable Agreement and pay the CIAC specified in the Agreement within the 180 day time limit, or termination of the Agreement, shall result in the expiration of the binding cost estimate. Any subsequent request for underground facilities will require the payment of a new deposit and the presentation of a new binding cost estimate. For good cause FPL may extend the 180 day time limit. Upon execution of either the Underground Facilities Conversion Agreement or the Underground Facilities Conversion Agreement - Governmental Adjustment Factor Waiver, payment in full of the CIAC specified in the binding cost estimate, and compliance with the requirements of this tariff, FPL shall proceed to convert the facilities identified in a timely manner. However, new service extensions, maintenance and reliability projects, and service restorations shall take precedence over facilities conversions.

12.2.6 Simultaneous Conversion of Other Pole Licensees

Before the initiation of any project to provide underground electric distribution facilities pursuant to either an Underground Facilities Conversion Agreement or an the Underground Facilities Conversion Agreement - Governmental Adjustment Factor Waiver the Applicant shall have executed agreements with all affected pole licensees (e.g. telephone, cable TV, etc.) for the simultaneous conversion of those pole licensees' facilities and provide FPL with an executed copy of the Agreement(s). Such agreements shall specifically acknowledge that the affected pole licensees will coordinate their conversion with FPL and other licensees in a timely manner so as to not create unnecessary delays. Failure to present FPL with executed copies of any necessary agreements with affected pole licensees within 180 days after delivery of the binding cost estimate to the Applicant shall result in the expiration of the binding cost estimate, the return of any CIAC paid, and the termination of any Underground Facilities Conversion Agreement or Underground Facilities Conversion Agreement - Governmental Adjustment Factor Waiver entered into between the Applicant and FPL.

12.2.7 Easements

Before the initiation of any project to provide underground electric distribution facilities pursuant to either an Underground Facilities Conversion Agreement or an Underground Facilities Conversion Agreement - Governmental Adjustment Factor Waiver, the Applicant shall provide FPL, at no cost to FPL, all easements, including legal descriptions of such easements and all survey work associated with producing legal descriptions of such easements, specified as necessary by FPL to accommodate the requested underground facilities along with an opinion of title that the easements are valid. Failure to provide the easements in the manner set forth above within 180 days after the delivery of the binding cost estimate to the Applicant shall result in the expiration of the binding cost estimate, the return of any CIAC paid, and the termination of any Underground Facilities Conversion Agreement or Underground Facilities Conversion Agreement - Governmental Adjustment Factor Waiver entered into between the Applicant and FPL.

(Continued on Sheet No. 6.320)

(Continued from Sheet No. 6.310)

12.2.8 Affected Customer Services

The Applicant shall be responsible for the costs associated with any modifications to the service facilities of customers affected by the conversion of FPL distribution facilities which are made necessary as a result of the conversion. The Applicant shall be responsible for arranging the conversion of affected residential overhead customer service facilities by providing, at no cost to FPL:

a) any necessary rearranging of the customer's existing electric service entrance facilities to accommodate an underground service lateral through the use of a licensed electrical contractor, in accordance with all local ordinances, codes, and FPL specifications; and

b) a suitable trench, install FPL provided conduit according to FPL specifications to a point designated by FPL, and perform the backfilling and any landscape, pavement or other similar repairs

FPL shall be responsible for the installation of the service lateral cable, the cost of which shall be included in the Applicant's binding cost estimate. In the event a customer does not allow the Applicant to convert the customer's affected overhead services, or the Applicant fails to comply with the above requirements in a timely manner consistent with FPL's conversion construction schedule, then the Applicant shall pay FPL, in addition to the CIAC specified in the binding cost estimate, the costs associated with maintaining service to said customer through an overhead service drop. The cost for maintaining an overhead service drop from an underground system shall be:

a) the sum of $789 for residential dwellings containing less than five individual units; or,

b) the estimated cost to maintain service for residential dwellings containing five or more individual units.

For existing residential underground service laterals affected by a conversion the Applicant shall be responsible for the trenching, backfilling and any landscape, pavement or other similar repairs and installation of FPL provided conduit, according to FPL specifications, necessary to bring existing underground service laterals of affected customers to an FPL designated handhole or transformer. FPL will install the necessary cable, the cost of which shall be included in the binding cost estimate. However, in the event that a customer owned service lateral fails on connection to the underground distribution system the customer will be responsible for the replacement of their service lateral or compliance with section 10.5 of FPL's tariff.

The Applicant's responsibilities for modifications to the service facilities of non-residential customers affected by the conversion of FPL distribution facilities which are made necessary as a result of the conversion will be specified in an attachment to any Underground Facilities Conversion Agreement or Underground Facilities Conversion Agreement - Governmental Adjustment Factor Waiver.

12.2.9 Other Terms and Conditions

Through the execution of either the Underground Facilities Conversion Agreement set forth in this tariff at Sheet No. 9.720 or the Underground Facilities Conversion Agreement - Governmental Adjustment Factor Waiver set forth in this tariff at Sheet No. 9.725 the Applicant agrees to the following:

a) The Applicant shall be responsible for all restoration of, repair of, or compensation for, property affected, damaged, or destroyed, to accommodate the installation of underground distribution facilities and the removal of FPL's overhead distribution facilities;

b) subject to section 2.7 *Indemnity to Company*, or section 2.71 *Indemnity to Company – Governmental*, FPL's General Rules and Regulations, the Applicant shall indemnify FPL from any claim, suit, or other proceeding, which seeks the restoration of, or repair of, or compensation for, property affected, damaged, or destroyed, to remove existing facilities or to accommodate the installation of underground distribution facilities arising from or brought as a result of the installation of underground distribution facilities;

c) the Applicant shall clear easements provided to FPL of trees, tree stumps and other obstructions that conflict with construction or installation of underground distribution facilities in a timely manner consistent with FPL's construction schedule.

(Continued on Sheet No. 6.330)

(Continued from Sheet No. 6.320)

12.2.10 Type of System Provided

An underground distribution system will be provided in accordance with FPL's current design and construction standards.

12.2.11 Design and Ownership

FPL will design, install, own, and maintain the electric distribution facilities up to the designated point of delivery except as otherwise noted. The Applicant may, subject to a contractual agreement with FPL, construct and install all or a portion of the underground distribution facilities provided that:

a) such work meets FPL's construction standards;

b) FPL will own and maintain the completed distribution facilities;

c) the construction and installation of underground distribution facilities by the Applicant is not expected to cause the general body of ratepayers to incur greater costs;

d) the Applicant agrees to pay FPL's current applicable hourly rate for engineering personnel for all time spent for (i) reviewing and inspecting the Applicant's work done, and (ii) developing any separate cost estimate(s) that are either requested by the Applicant to reflect only FPL's portion of the work or are required by FPL to reflect both the Applicant's and FPL's portions of the work for the purpose of a GAF Waiver calculation pursuant to an Underground Facilities Conversion Agreement – Governmental Adjustment Factor Waiver; and

e) the Applicant agrees to rectify any deficiencies found by FPL prior to the connection of any Customers to the underground electric distribution system and the removal of the overhead electric distribution facilities.

12.2.12 Relocation

Where underground electric facilities are requested as part of, or for the purpose of, relocation, the requirements of this tariff shall apply. As applicable, the Underground Facilities Conversion Agreement or the Underground Facilities Conversion Agreement - Governmental Adjustment Factor Waiver shall be executed as an addendum to the relocation agreement between FPL and the Applicant. In the event of any conflict between the relocation agreement and this tariff, the tariff shall control. Furthermore, where the regulations of the Federal or State Department of Transportation (DOT) prevent pre-payment of deposits and other conversion costs, the Federal or State DOT may pay the CIAC after the work has been performed.

UNDERGROUND FACILITIES CONVERSION AGREEMENT – GOVERNMENTAL ADJUSTMENT FACTOR WAIVER

This Agreement is made and entered into this _____ day of _____, 20____, by and between TOWN OF SURFSIDE ("Local Government Applicant"), a Florida municipal corporation or county with an address of 9293 Harding Ave., Surfside, FL 33154 and FLORIDA POWER & LIGHT COMPANY ("FPL"), a Florida corporation with an address of P.O. Box 14000, 700 Universe Boulevard, Juno Beach, FL 33408-0429.

WHEREAS, the Local Government Applicant has requested that FPL convert certain overhead electric distribution facilities located within the following boundaries (the "Conversion"):
__the Entire Town west of Collins Ave. (collectively, the "Existing Overhead Facilities", WR # -4269751, -4269743, -4269734) to underground facilities, including transformers, switch cabinets and other appurtenant facilities installed above ground as set forth in Attachment A hereof (collectively, the "Underground Facilities", WR # 4269737, -4269749, -4269755, See the attached drawings).
NOW THEREFORE, in consideration of the foregoing premises and the covenants and agreements set forth herein, and other consideration the sufficiency of which is hereby acknowledged, the parties intending to be legally bound, hereby covenant and agree as follows:

1. **Governmental Adjustment Factor Waiver ("GAF Waiver") Eligibility Criteria.** The Local Government Applicant represents and warrants that it meets the following eligibility criteria for the Conversion:
   a. . In order for the Conversion to incorporate a sufficient amount of overhead facilities to provide electrical continuity, the Conversion must include a minimum of approximately 3 pole line miles or approximately 200 detached dwelling units within contiguous or closely proximate geographic areas (the "Conversion Area"). The Conversion may be completed in mutually agreed upon phases, with the project size minimums applying to the aggregate project – provided that any necessary subsequent phase begins within a 1 year period from completion of the prior phase and the minimums are met within, at most, 3 phases; and
   b. The Local Government Applicant must require all customers within the Conversion Area who currently have overhead service directly from the Existing Overhead Facilities to convert their service entrances to underground within 6 months of completion of the Underground Facilities installation or each phase thereof; and
   c. The Local Government Applicant must be willing and able to execute a right of way ("ROW") agreement with FPL if the Local Government Applicant requests that facilities be placed in the ROW; and
   d. For any affected laterals, the complete lateral must be converted, including all stages of any multi-stage lateral; and
   e. The Local Government Applicant must demonstrate to the reasonable satisfaction of FPL that the sum of the GAF Waiver credit plus any federal or state funds that the Local Government Applicant is able to use to support the Conversion does not exceed the otherwise applicable CIAC as calculated before application of the GAF Waiver.

   Special Circumstances. Conversions which do not meet the project size minimums described in section 1.a are eligible for the GAF Waiver in the following special circumstances:
      i. 100% of the Existing Overhead Facilities within the Local Government Applicant's corporate limits are to be converted, but are less than the pole line mileage or dwelling unit minimums; or
      ii. A single lateral that serves at least one Critical Infrastructure Facility as determined by the appropriate local agency with the mutual agreement of FPL; or
      iii. An island or peninsula where 100% of the Existing Overhead Facilities are to be converted; or

(Continued on Sheet No. 9.726)

(Continued from Sheet No. 9.725)

iv. When the aggregate size of the first 3 phases of a project would satisfy the minimum size criteria but, for mutually-agreed engineering or logistical reasons, those phases are non-contiguous; provided that (a) the next (4th) phase must be adjacent to one or more of the first 3 phases such that the combined contiguous area meets the minimum size criteria, and (b) this 4th phase begins within 1 year from completion of the 3rd phase.

2. **Contribution-in-Aid-of-Construction (CIAC).** The Local Government Applicant shall pay FPL a CIAC as required by FPL's Electric Tariff and Section 25-6.115 of the Florida Administrative Code with the Otherwise Applicable CIAC amount reduced by the GAF Waiver.

i.	Otherwise Applicable CIAC	$ 7,486,221
ii.	GAF Waiver	$ 1,871,555
iii.	**CIAC Due**	$ 5,614,666 (FPL performs ALL UG work)

In the event the actual cost of the Conversion exceeds the estimate, the Otherwise Applicable CIAC shall be adjusted by the lesser of (a) the difference between the actual cost of the Conversion and the estimate, or (b) 10% of the Otherwise Applicable CIAC identified above. The GAF Waiver shall also be adjusted accordingly and the Local Government Applicant shall pay FPL the resulting difference in the amount of the CIAC Due.

3. **Applicant-Installed Facilities.** The Local Government Applicant may, upon entering into an applicant-installed facilities agreement satisfactory to FPL, construct and install all or a portion of the Underground Facilities. Such work must meet FPL's construction standards and FPL will own and maintain the completed facilities. The Local Government Applicant agrees to rectify any deficiencies, found by FPL, prior to the connection of any customers to the Underground Facilities and the removal of the Existing Overhead Facilities.

4. **Compliance with Tariff.** The Local Government Applicant agrees to comply with and abide by the requirements, terms, and conditions of FPL's Electric Tariff.

5. **Timing of Conversion.** Upon compliance by the Local Government Applicant with the requirements, terms, and conditions of FPL's Electric Tariff, this Agreement and any other applicable agreements, FPL will proceed in a timely manner with the Conversion in accordance with the construction drawings and specifications set forth in Attachment A hereof.

6. **Relocation.** In the event that the Underground Facilities are part of, or are for the purposes of, relocation, then this Agreement shall be an addendum to the relocation agreement between FPL and the Local Government Applicant. In the event of any conflict between the relocation agreement and this Agreement or the Electric Tariff, this Agreement and the Electric Tariff shall control.

7. **Term.** This Agreement shall remain in effect for as long as FPL or any successor or assign owns or operates the Underground Facilities.

8. **GAF Waiver Repayment.** If the Local Government Applicant does not satisfy the relevant eligibility criteria, the Local Government Applicant shall repay the GAF Waiver within 30 days of written notice from FPL of such failure. Additionally, if at any point within 30 years of completion of the Underground Facilities installation, the Local Government Applicant elects to have electric service within the Conversion Area supplied by a provider other than FPL, the Local Government Applicant shall repay FPL a pro-rata share of the GAF Waiver. The pro-rata share (which shall reflect partial years) shall be determined as follows:

GAF Waiver * [(30 – years since the Underground Facilities completion date) / 30].

(Continued on Sheet No. 9.727)

(Continued from Sheet No. 9.726)

9. **Termination Prior to the Conversion Completion.** Failure by the Local Government Applicant to comply with any of the requirements, terms, or conditions of this Agreement or FPL's Electric Tariff shall result in termination of this Agreement. The Local Government Applicant may terminate this Agreement at any time prior to the start of the Conversion and the CIAC paid by the Local Government Applicant will be refunded to the Local Government Applicant; provided however, that the refund of the CIAC shall be offset by any costs incurred by FPL in performing under the Agreement up to the date of termination.

10. **Assignment.** The Local Government Applicant shall not assign this Agreement without the written consent of FPL.

11. **Adoption and Recording.** This Agreement shall be adopted by the Local Government Applicant and maintained in the official records of the Local Government Applicant for the duration of the term of this Agreement. This Agreement also shall be recorded in the Official Records of the County in which the Underground Facilities are located, in the place and in the manner in which deeds are typically recorded.

12. **Conflict between Terms of Franchise Agreement.** In the event of a conflict between the terms of this Agreement and any permit or franchise agreement entered into by Local Government Applicant and FPL, the terms of this Agreement shall control.

IN WITNESS WHEREOF, FPL and the Local Government Applicant have executed this Agreement on the date first set forth above.

TOWN OF SURFSIDE

Signed_____

Name_____

Title_____

Signed_____

Name_____

Title_____

Approved as to Terms and Conditions

Signed_____

Name_____

Title_____

Approved as to Form and Legal Sufficiency

Signed_____

Name_____

Title_____

FPL

Signed_____

Name_____

Title_____

Overhead to Underground Conversion - Customer Cost Sheet

Project: Surfside - Overall

Date Estimate Provided to Customer: September 27, 2012

FPL performs all work

Underground Cost		
New UG Installation (+)	$8,986,634	Cost for FPL to install new underground facilities
Equivalent OH Installation (-)	($2,938,027)	Cost to install an overhead system at current hardening standards
Existing Overhead Cost		
OH Removal Cost & Make ready (+	$1,330,499	Cost for FPL to remove existing overhead facilities
Existing OH Value (+)	$107,115	Net Book Value of existing OH facilities to be removed
Operational Costs Differential (+)	$0	30-year Net present value of the est. operational OH / UG Diff. cost
Salvage Value (-)	$0	Credit for re-usable items
Subtotal*	$7,486,221	Total customer contribution as specified in Tariff 12.2.3
GAF	($1,871,555)	
CIAC	$5,614,666	
Engineering Deposit (-)	($59,844)	Engineering deposit previously collected
Net Due FPL	$5,554,822	Total customer contribution owed

Cost Breakdowns for Customer Contributions

	Total	Labor/Vehicle	Material	Direct Engineering, Supervision, and Support
New UG Facilities (+)	$8,986,634	$3,267,301	$3,894,695	$1,824,638
Credit for equivalent OH (-)	($2,938,027)	($1,124,882)	($1,308,194)	($504,951)
OH Removal Cost & Make ready (+	$1,330,499	$1,081,613	$40,512	$208,374
Total	$7,379,106	$3,224,032	$2,627,013	$1,528,061
Net Book Value (+)	$107,115			
Operational Costs Differential (+)	$0			
Salvage Value (-)	$0			
Subtotal*	$7,486,221			
GAF	($1,871,555)			
CIAC	$5,614,666			
Engineering Deposit (-)	($59,844)	Engineering deposit previously collected		
Net Due FPL	$5,554,822			

Major Material Breakdown

	Quantity	Item
Install	267,685	Primary UG Cable (feet)
	24	UG Switch Cabinet (VISTA)
	307	UG Transformer (each)
	22	Splice box for UG feeder (each)
Remove	114,623	OH Primary Conductor (feet)
	470	Poles (each)
	278	OH Transformer (each)
	1,199	Primary UG Cable (feet)

TO: **Mr. Roger Carlton**

FROM: **Ms. Ana F. Iglesias**

RE: **Undergrounding Utilities**

DATE: **March 9, 2012**

I. UNDERGROUNDING UTILITIES

A) Introduction

A public utility, as defined in the Florida Statutes, is every person, corporation, or association that supplies electricity or gas to or for the public within the state.[1] Public utilities have the duty to furnish sufficient and efficient service to each person that applies to receive electricity or gas.[2] The Florida Public Service Commission (FPSC) is the entity that protects Florida's consumers, and has the authority, power, and duty to regulate all public utilities that supply essential services, *i.e.*, electric, water, natural gas, telephone, and wastewater.[3] This entity regulates the rates utilities charge for services while monitoring the safety of the services provided, and ensures that utilities comply with the FPSC's requirements.[4]

As expressed in the Florida Statutes, all rates demanded or received by any public utility for any service rendered or to be rendered by it, and each rule and regulation shall be fair and reasonable.[5] Most importantly, no preferences may be granted to any person or locality. The Florida Legislature has declared that it is critical to utilize the most efficient and cost-effective demand-side renewable energy systems and conservation systems in order to protect the health and general welfare of the state and its citizens.[6] It further declares that

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[1] *See §366.02*, Florida Statutes, defining a public utility. Gas can be natural, manufactured, or a similar gaseous substance.
[2] *See §366.03*, Florida Statutes, all rates and charges made, demanded, or received by any public utility must be reasonable.
[3] *See* Florida Public Service Commission website, http://www.psc.state.fl.us.
[4] *See §366.04*, Florida Statutes, for further details regarding the Florida Public Service Commission's jurisdiction.
[5] No public utility shall be required to furnish electricity or gas for resale. Except that a public utility may be required to furnish gas for containerized resale.
[6] *See §366.81*. Florida Statutes, for more information regarding the Legislature's intent with regards to public utilities.

the FPSC is the appropriate agency to adopt goals and approve plans related to the promotion of demand-side renewable energy systems and the conservation of electric energy and natural gas usage.

After introducing the functions of the FPSC, this brief analysis will discuss the MGRUF tariff, the "Coastal Barriers Infrastructure Finance Act" that will take effect on July 1, 2012, and the steps required to establish a successful Infrastructure-Financing District.[7]

B) Florida Public Service Commission

As I mentioned previously, the FPSC's main function is to regulate and supervise all public utilities. Consequently, the FPSC has the duty to examine and test all meters that are used for measuring any product or service of a public utility.[8] Additionally, the FPSC approves agreements between electric cooperatives, resolves territorial disputes among municipal electric utilities, and prescribes uniform systems of accounts or a rate structure for all electric utilities. The FPSC is also responsible for establishing reasonable fees to be paid by each user or consumer, for the purpose of testing meters.

Users or consumers can choose to have their meters tested upon payment of the fees fixed by the commission. Standard measuring instruments may be purchased to carry on the testing at the request of the users or consumers. Should any public utility violate any of the FPSC's rules or orders, the violation will constitute irreparable harm. When violations occur, the FPSC is authorized to seek relief in circuit court including temporary and permanent injunctions, restraining orders, or any other appropriate order.[9] The FPSC's jurisdiction is superior to that of all municipalities, towns, counties, or agencies. During conflicts, the rules, regulations, and lawful acts of the FPSC will prevail in each instance.

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[7] Florida's statutory laws and codes were consulted while writing this analysis.
[8] *See §366.05*, Florida Statutes.
[9] The remedies mentioned are in addition to any other remedies available for enforcement of agency action under statute 120.69, or the provisions of chapter 355 of the Florida Statutes.

C) Strengthening Florida's Infrastructure

The coasts of the State of Florida have been severely impacted in the recent past. Because of that, it has been argued that Florida's electrical infrastructure must be strengthened. Recently, there has been a growing trend towards undergrounding utilities. Many have disputed that converting utilities is a better alternative to protecting utilities from rain and wind-storm damage. However, the question of whether utilities should be converted from overhead to underground has sparked a lot of controversy. The trend towards undergrounding utilities has led to an increase in research efforts aimed at analyzing both the advantages and disadvantages of converting the utilities to the underground. Some of the considerations that must be analyzed are the high costs in converting utilities, and the time required to accomplish the undergrounding.

Several cities in Florida have been studying the cost, need, and benefits of undergrounding utilities in areas that have the greatest risk of service interruption and property damage from hurricanes, or similar natural disasters. Some cities have gone as far as forming a committee specifically dedicated to analyzing, planning and implementing the conversion of utilities from overhead to underground.[10]

While some advantages of placing utilities in the underground include: aesthetic appeal (due to lack of utility poles), potential impact on property values, and protection from hurricane damage, the major disadvantages include: costs of conversion, corrosion, pipe bursting, flood damage, water intrusion, and costly or time consuming service repairs *post*-hurricanes. Maintaining and repairing overhead utilities is not always the cheaper alternative because it is burdensome and expensive to repair or support aerial utilities as well.

[10] In Amelia City, an Underground Committee was formed in 2005. In a report presented during November 2011, the UC recommended a plan to underground all utilities by 2020. The report further stated that the costs of undergrounding utilities should be "borne by the utility provider, and recovered if needed through rate changes affecting all customers." Estimated extra costs per home for undergrounding utilities are $850 for putting new underground, and $250 for replacements underground.

Although many argue that underground utilities face as many outages as overhead utilities, one of the primary benefits of placing new or existing lines underground is that it reduces the frequency of outages caused by storms or hurricanes. It also reduces the risk of the public coming in contact with live wires. On the other hand, undergrounding existing overhead utilities is very expensive. Moreover, repairing underground lines is more difficult than overhead lines because the underground damage may be difficult to locate. Overhead systems suffer outages when trees or debris blow into lines, and underground systems risk outages when tree-root systems uproot cables each time trees topple above ground from excessive wind, rain, or storm surges. Nonetheless, several municipalities require that new distribution systems be underground. The FPSC and the Florida Legislature both recommend undergrounding existing utilities, especially in areas located close to the coast.

D) MGRUF: Mechanism for Governmental Recovery of Underground Fees

1) MGRUF Tariff

The MGRUF tariff is an optional mechanism offered by FPL to municipalities or counties in Florida that possess tax assessment authority.[11] This mechanism allows local governments to apply for this particular tariff and enter into the Underground Capital Cost Recovery Contract with FPL.[12] The main advantage of this tariff is that it allows for the recovery of certain costs paid by or due from the local government to FPL in connection with the conversion of utilities from overhead to underground service. The Underground Capital Cost Recovery Contract must be approved by the FPSC, and must state the specific terms and conditions for underground cost recovery.

[11] FPL (Florida Power & Light Company) has implemented the MGRUF tariff as a mechanism for the government to recover undergrounding fees. Please visit FPL's website to see the specific rules and regulations that apply to FPL's MGRUF tariff. It should be noted that those rules and regulations are supplementary to the regulations governing services by utilities issued by the Florida Public Service Commission.

[12] *See Section 14.0.* Florida Power & Light Company website, http://www.fpl.com/rates/pdf/electric_tariff_section6.pdf.

An Underground Assessment Area (UAA) is a defined geographic area with set boundaries. Any local government interested in contracting with FPL will be required to establish an UAA.[13] Customers located within these boundaries will benefit from the underground conversion project. After an UAA has been successfully established, a governmental undergrounding fee will be added to the bills of those customers located within the boundaries of the UAA.

2) Target Annual Payment & Actual Annual Payment

The governmental undergrounding fee serves as a recovery mechanism for local governments interested in converting their overhead utilities. All customers located within the UAA will receive a monthly governmental undergrounding fee which will be billed by FPL directly to them.[14] That undergrounding fee is intended to produce a Target Annual Payment to the local government. The formula employed to calculate the Target Annual Payment is: [(FC + GC + BC) x i, divided by $1 - (1/(1+i)^n)$]. In other words, FPL multiplies the sum of a: (a) Facility Charge, (b) Governmental Cost, and (c) Billing Charge by the interest rate on the bonds or other financial instruments used by the local government to finance (a), (b), and (c). The formula then requires the previously calculated amount to be divided by $1 - (1/(1+i)^n)$.

The total result obtained with that formula helps FPL to evaluate an amount to be recovered through the governmental undergrounding fee which is added to the bills of all customers located within the specific UAA. The *'facility charge'* includes all amounts payable to FPL in connection with the conversion of the utilities. The *'governmental cost'* consists of all costs related to the undergrounding project, as well as the total cost charged by electrical

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[13] *Id.*, An UAA may consist of all or any contiguous portion of the area within the local government's corporate limits, and may overlap all or portions of other UA areas that have previously been established by the local government.

[14] This fee is assessed as a percent of total electric revenues, and will be subject to the terms of the applicable Underground Capital Cost Recovery Contract.

[n] The letter "*n*" is equal to the number of years over which (a), (b) and (c) are to be recovered by the local government, and this shall not exceed a maximum of twenty (20) years.

[n] The letter "*n*" is equal to the number of years over which (a), (b) and (c) are to be recovered by the local government, and this shall not exceed a maximum of twenty (20) years.

contractors hired by the local government to convert facilities to receive underground service. Finally, the *'billing charge'* is equal to $50,000 or 10% of the facility charge, whichever is less.

This fee must not exceed the lesser of (1) 15% of the customer's total net electric charges, or (2) a maximum monthly amount of $30 for each residential customer and $50 for every 5,000 kWh of consumption for each non-residential customer. It is important to note that only those amounts that have been *actually collected* through the governmental undergrounding fee will be remitted by FPL to the local government. The amount that is remitted to the local government is referred to as the *Actual Annual Payment*, and is sent within sixty (60) calendar days following the conclusion of each calendar year.[15]

3) Notice and Public Records

A notice must be mailed by the local government to all customers located within the proposed UAA region.[16] Such notice shall state the intention to recover the cost of the underground conversion project through a governmental undergrounding fee on each customer's electric bill. Customers must receive this notice at least ninety (90) days before the execution of the Underground Capital Cost Recovery Contract pursuant to the MGRUF tariff. Additionally, once the governmental undergrounding fee is approved by the local government, notice must be filed in the public records.[17]

E) "Coastal Barriers Infrastructure Finance Act"

This Act will take effect on July 1, 2012, and will allow registered electors of a coastal barrier region to create a financing district to plan and pay for the construction of underground utilities – *by means of a petition followed by a referendum.*[18] Once this Act becomes

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[15] *See* FPL website for further terms and conditions regarding the Actual Annual Payment.
[16] Local governments are required to comply with all applicable federal, state and local laws when establishing an UAA, and imposing the governmental undergrounding fee.
[17] *See* FPL website for a list of instances when FPL may withhold the application of the MGRUF tariff. Some of this include: in instances when FPL estimates that the Annual Target Payment would exceed 15% of the net electric charge from customers within the UAA, or if the local government does not comply with the terms and conditions of this tariff.
[18] *See* The Florida Senate website, http://flsenate.gov/Session/Bill/2012/0466/BillText/c1/HTML.

effective, chapter 163 of the Florida Statutes will provide the governance for the establishment, operation, and regulation of these intergovernmental programs.

The authority controlling the financing district will be the local governing body of such designated region. The governing authority shall be vested with certain important powers, such as the power to invest and borrow money. Proceeds are intended to be generated through a tax increment, which will be held by a local trust fund. Some exemptions from the tax do exist and will be detailed below.

The Florida Legislature expressly declares in section 163.72(3) of the statutes that "*underground utilities provide a delivery system for utility services which is safer and more reliable than overhead facilities during and after severe storm and weather events to which coastal barriers are often exposed.*" To achieve that end, the Legislature provides local governments with an alternative mechanism for financing, installation, and operation of utility systems serving coastal barrier communities. It is evident that the Legislature intends to protect Florida's communities, and coastal barrier resources.

1) Coastal Barrier Infrastructure-Financing District

As of July 1, 2012, coastal barrier infrastructure-financing districts shall be created by an ordinance by the governing body of a county or municipality.[19] An infrastructure-financing district can cover any geographic area within a coastal barrier system designated by the governing body of a local government for infrastructure financing and construction.[20] The governing authority of a district will need to possess powers that will authorize it to levy an ad valorem tax increment to help finance the underground conversion project.

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[19] *See §163.74(3)*, Florida Statutes, stating that after a simple majority of the electors voting in the referendum election approve the question submitted for referendum, the governing authority of the local government may create a financing district by ordinance.

[20] *See §163.76*, Florida Statutes, a "coastal barrier" means a coastal barrier island or other coastal feature consisting of a beach, or related features located within a coastal building zone, as those terms are defined in §161.54 of the statutes.

A referendum election will be conducted where if a simple majority of the registered electors voting in the election approve the question submitted for referendum, the local government will be permitted to create a financing district.[21] After the financing district has been successfully created, the governing body of the local government will be required to adopt an infrastructure-financing plan. That plan is to be adopted within six (6) months after the county or municipality creates the financing district.[22]

Each of these financing districts is to be governed by a coastal barrier infrastructure-financing authority which will have power to: execute contracts, plan and carry out approved coastal barrier infrastructure projects, invest finance funds, borrow money, make surveys, adopt or amend any coastal barrier infrastructure finance plan, and make all necessary expenditures.[23] The term *'infrastructure'* includes any of the following activities: the construction, reconstruction or improvement of electrical, telephone, cable, and other utility services delivered to a community by wire or cable, and any related land acquisition, planning, design, engineering, and administrative costs.[24]

2) Referendum

Registered electors who are residents within the coastal barrier are allowed to petition the governing body of the county or municipality to conduct a referendum on whether an infrastructure-financing district should be created, for the purpose of financing and constructing underground utilities.[25] There is a particular procedure that must be followed when registered electors petition for a financing district. The referendum will be conducted on the question of whether a financing district should be established.

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[21] *Id.*
[22] *See §163.76*, Florida Statutes, with regards to what details must be included in the Coastal Barrier Infrastructure Plan.
[23] *See §163.75*, Florida Statutes, for further detailed description.
[24] *See §163.73*, Florida Statutes, for other definitions.
[25] *See §163.74*, Florida Statutes, regarding the mandatory referendum for establishing a financing district.

Section 163.74 of the Florida statutes describes the question that must be included in the referendum. The question must say: "*Shall the ...governing board of (...County or Municipality...) create an infrastructure financing district within the following legally described area for the purpose of providing a tax increment mechanism to finance and construct an underground utility infrastructure?*" The question need be asked in that form, and must be followed by the words "*yes*" and "*no.*" If the question is approved by a simple majority of the electors voting in the referendum election, the governing authority of the local government may create the financing district by ordinance.

Notice must be published in a newspaper of general circulation in the area proposed for the establishment of the financing district. The legal description and map of the coastal barrier proposed for designation as an infrastructure-financing district shall be informed of as well. The referendum may be conducted via mail, and must be conducted within 120 days after the governing body has verified that 10 percent of the electors have signed the petition.

3) Coastal Barrier Infrastructure Plan

A coastal barrier infrastructure plan must be established within six (6) months after an infrastructure-financing district has been created. These infrastructure plans must contain specific information such as: an inventory and survey of all utility infrastructure is presently located above ground within the designated coastal barrier, and all necessary rights-of-way and property needed for the construction of a system of underground utilities within the barrier. Finally, an engineering design for a system of underground utility facilities within the barrier must be included in the infrastructure plan as well.[26]

[26] *See §163.76*, Florida Statutes, describing the creation of the coastal barrier infrastructure plan.

4) Local Trust Fund

According to the Act, local governments will be required to establish a local trust fund for the purpose of holding the funds that the infrastructure-financing district collects.[27] Accordingly, the local trust fund is to be funded with the proceeds collected from the ad valorem tax increment levied each year within the designated coastal barrier district by the taxing authorities. The fund needs to be funded continually while the project is in effect, or until all debts incurred to finance the project are no longer outstanding, whichever occurs later. The proceeds collected within the financing district must be a minimum of 75% of the difference between (a) the amount of ad valorem tax collected each year by each taxing authority, and (b) the amount of ad valorem taxes which would have been produced by the rate upon which the tax is levied each year by or for each taxing authority.[28]

5) Exemptions & Dissolution

Once the Act is in effect, section 163.78 of the Florida statutes will detail some of the public bodies or taxing authorities that are exempt from the effects of this Act. These include: special districts that collect ad valorem taxes on real property in more than one county, metropolitan transportation authorities, neighborhood improvement districts, community redevelopment agencies, library districts, or water management districts, among others.

The Legislature has also provided for the dissolution of these infrastructure-financing districts upon the completion of the project's objectives.[29] As such, section 163.79 states that these financing districts are intended to be dissolved after all the coastal barrier infrastructure projects have been completed. If it happens that assets and liabilities remain, these shall be transferred to the county or municipality within which the financing district is located.

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[27] *See §163.77*, Florida Statutes, for details discussing how a local trust fund can be properly established.
[28] *Id.*, regarding the possible methods of funding a local trust fund.
[29] *See §163.79*, Florida Statutes, with regards to the dissolution of infrastructure-financing districts.

F) Supplementary Law

Chapter 170 of the Florida statutes also authorizes the governing authority of any municipality to levy special assessments on benefited real property.[30] This specifically means that municipalities can pay for the relocation of utilities, and this covers the undergrounding of utilities such as cable, telephone and electrical services. Special assessments may be collected directly from the local government that is imposing the assessment.

II. CONCLUSION

Converting overhead utilities to underground services is not a quick task. As the trend continues towards relocating currently existing overhead lines to the underground, Infrastructure-Financing Districts will help local governments finance undergrounding projects, and contribute to conserve energy systems while protecting the welfare of the state. After these districts are successfully implemented, utilities will hopefully be better protected against the perils from hurricanes, wind storms, and storm surges. Regardless, due to the high costs of converting utilities, and the possible disadvantages from having utilities hidden below the ground, questions will remain as to which alternative is most appropriate in states that frequently run the risk of suffering extreme weather conditions.

[30] *See §170.01(1)(d)*, Florida Statutes, for further details regarding special assessments.

Town of Surfside
Commission Communication

Agenda Item #: 9F

Agenda Date: December 11, 2012

Subject: FPL Undergrounding Status Report

Background: One of the many things this Town Manager has learned about the decision making process in Surfside is that major projects only become a reality through small incremental steps. A prime example is the Community Center. When I was first hired in September 2010 this project was moribund, behind schedule and clearly did not have enough usable space to meet the expectations of the Town Commission and the community. Decisions were made to adjust the schedule, add the "fish bowl", move the mountain of stored fill, establish a maximum budget, set an opening date and delegate change order approval to the Town Manager within the maximum budget. These decisions were made incrementally and the project was completed on time and within budget.

The same process occurred with the water/sewer/storm drainage project. This project was also moribund. The only prior accomplishment was to set rates to fund the project. Many in the community did not trust the Staff to be able to implement the project based on the difficult earlier experience with the Community Center. Again, the Town Commission made decisions on an incremental basis. The consultant CGA was authorized to finish the design and prepare the bid documents. A list of pre-qualified contractors was approved and bids were received. A top flight Citizens Advisory Committee was established. A determination was made to obtain prices for additive alternates such as traffic calming, street signs and street trees. The decision was also made to hold off on awarding these items until the basic scope of work cost was known. In a similar manner, the Town Manager was given authority to finish the project within a maximum budget. Financing and partial refinancing decisions were made along the way and Staff is committed that we will finish this project (nearly five times the dollar value of the Community Center) within the final budget and on time.

Analysis: The Administration believes that the success of the first two capital projects provides many "lessons learned" for the undergrounding project. First, the decisions have been made incrementally and should continue to be. More than a year ago, the Town Commission decided to spend $360,000 to provide conduit for future undergrounding of the electric, cable TV, telephone and fiber optic systems as well as to authorize FPL to prepare a study of the cost to underground their system. A report to the Town Commission on the November 13, 2012 agenda delivered the FPL report and we are pleased to let you know that FPL has lowered their estimated price to $4,193,588 from the $6,454,822 the based on the Town's ability to manage the project using FPL approved contractors. We are also meeting with senior representatives of Atlantic Broadband and AT&T later this week to determine if they will absorb the cost of their undergrounding. This will be known prior to next month's Town Commission meeting. There will be many other decisions to make before the final "go, no go" decision needs to be made.

What Are We Asking You To Do This Month? The only decisions we are asking you to make this month is to authorize a public information campaign to occur in January, 2013 and to establish a Citizens Advisory Committee for this project. Staff proposes five meetings. Three would be in the single family neighborhood using the boundaries used for the three phase water/sewer/storm drainage project. Two additional meetings would be held for the downtown businesses/owners and the condominium residents along Collins/Harding Avenues. We would advertise the meetings in a variety of media and televise the meetings. The Town Commission is encouraged to attend the meetings, however, minutes will be taken for your review before making a final decision. The Citizens Advisory Committee will be fully briefed as the similar committees have been for the water/sewer/storm drainage project and the parking structure feasibility study.

Frequently Asked Questions (FAQs): The Administration is in the process of preparing a list of more than 25 FAQs. These range from defining the project scope to how it will be funded. By way of information, we found 19 homes in the single family neighborhood where the water service was not properly grounded and fixed the problem as part of absorbing the cost to tie into the new system. There may be as many as 100 homes that need to upgrade their electric service. Staff will prepare a program to help residents that need to upgrade their electric service. There will also be a compilation of studies done by experts that are both pro and con.

Summary: This Town Commission and your Administration has performed very well on the two major infrastructure projects (Community Center and water/sewer/storm drainage). Collectively we are fully able to do it again if decisions continue to be made on an incremental basis. As you consider the decision to authorize a public information program, please remember that the major elements of this project are aligning in a positive way that is rarely seen in local government infrastructure projects. The team is in place to implement this with Finance Director Donald Nelson, Financial Advisor Sergio Masvidal and Bond Counsel JoLinda Herring, Public Works Director Bill Evans and Project Manager Randy Stokes. Borrowing rates are very low on the order of 2 – 2.5 percent. Construction costs are also very low. Finally, there is much support in Town for this project and you will have the opportunity to assess citizen input as the result of five public meetings.

Schedule: Per the requirements of FPL it will be necessary to make a final decision and provide funding before the end of April, 2013. There may be an ability to achieve a very limited extension under certain circumstances. Representatives of FPL will be in attendance during the December 11, 2012 Town Commission meeting 8:00 p.m. time certain Agenda Item 9F for this project.

Roger M. Carlton, Town Manager

Bill Evans, Public Works Director

Dawn Hunziker

From: Michael Karukin
Sent: Tuesday, January 08, 2013 3:24 PM
To: Roger Carlton; Bill Evans
Subject: Undergrounding Project - Surfsidde Florida
Attachments: PURC Undergrounding Phase 1 Report Exec Summ.pdf; PURC Undergrounding Phase 2 Report Exec Summ.pdf; PURC Ungergrounding report 3 execsumm.pdf; PURC comment about funding of undergrounding research 11-13-2012.pdf; Storm Hardening Paper.pdf

This email has 5 attachments related to the the undergrounding project:

- 3 executive summaries from PURC reports;
- a statement from PURC about funding and the review process
- Copy of an article on undergrounding

Background

1) Last year I heard a story about this topic on NPR. It is only **4 minutes and 28 seconds**. Please listen.
http://www.npr.org/2011/08/29/140042767/would-burying-power-lines-reduce-power-outages

2) The research is summarized in reports found at http://warrington.ufl.edu/centers/purc/research/energy.asp under the heading "Research in Electricity Infrastructure Hardening".

3) Here's a quote from the article that got my attention:

*"the relocation of power lines does not really eliminate the risk of storm-related damage, it simply reduces the potential damage from wind and **increases** the potential damage from storm surge and flooding." (page 68, **Holt, Lynne, and Theodore Kury.** 2011. "Florida's Storm Hardening Effort: A New Paradigm for State Utility Regulators" The Electricity Journal, 24(4):62-71.*

http://warrington.ufl.edu/purc/purcdocs/papers/1109_ab_Holt_Florida_Storm_Hardening.pdf

4) I attached the executive summaries from the phase 1, 2, and 3 reports from Public Utility Research Center at the University of Florida . The **executive summary** of each is not long (report 1 is 4 pages; report 2 is 1 page; and report 3 is 6 pages).

5) Below is a **List of potential benefits** and **list of potential disadvantages** taken from the executive summary of report 1, page 3 and 4.

Potential Benefits

- Improved aesthetics
- lower tree trimming costs
- lower storm damage and restoration costs
- fewer motor vehicle accidents
- reduced live wire contact
- fewer outages during normal weather
- far fewer momentary interruptions
- improved utility relations regarding tree trimming
- fewer structures impacting sidewalks

Potential Disadvantages

- Stranded asset costs for existing overhead lines
- Longer duration interruption and more customers impacted per outage
- Susceptibility to flooding, storm surges, and damage during post-storm cleanup
- Reduced life expectancy
- Higher maintenance and operating costs (FPL said this is not a town cost - need to confirm)
- Higher costs for new data bandwidth

6) The reports were funded by the following companies (See attached for statement about funding and review process).

- Florida Power & Light Company
- Florida Public Utilities Company
- Progress Energy Florida, Inc.
- Florida Municipal Electric Association
- Tampa Electric Company
- Florida Electric Cooperatives Association
- Gulf Power Company
- Lee County Electric Cooperative, Inc.

Thank you,

Michael Karukin, PA., PhD.

Vice Mayor

Town of Surfside

9293 Harding Ave

Surfside, FL 33154

Tel: (305) 861-4863 / Fax: (305) 993-5097 / Cell: (305) 710-5894

Email: mkarukin@townofsurfsidefl.gov

www.townofsurfsidefl.gov

Florida's Storm Hardening Effort: A New Paradigm for State Utility Regulators

Following several hurricanes in 2004 and 2005, the Florida Public Service Commission initiated a multi-year process that emphasized both collaboration and research and resulted in expanded requirements for utility accountability. An alternative approach was recommended by Joshua Rokach in a recent article in this journal. Regardless of the regulatory process selected, policy questions remain as to the best way to proceed.

Lynne Holt and Theodore K. Kury

Lynne Holt *is a policy analyst with the Public Utility Research Center at the University of Florida, where she researches and writes on a variety of regulatory policy issues. Her other center affiliations at the University of Florida include Assistant Director for the Reubin O'D. Askew Institute and research analyst for the Bureau of Economic and Business Research. Dr. Holt has more than 31 years of experience in public policy formulation and research. Her areas of expertise include public utility regulatory policy and policy issues related to education, health reform, tax, budget analysis, and economic development. Dr. Holt received a Ph.D. and M.A. from Harvard University, an M.P.A. from the University of Kansas, and a B.A. from Douglass College, Rutgers University. She can be reached at lynne.holt@warrington.ufl.edu.*

Theodore J. Kury *is the Director of Energy Studies at the Public Utility Research Center at the University of Florida. He is responsible for promoting research and outreach activities in energy regulation and policy. His current research interests include the economic and developmental impacts of environmental and energy policy. He holds B.A. and M.A. degrees in Economics from the State University of New York at Buffalo. He can be reached at ted.kury@warrington.ufl.edu.*

The authors thank Mary Galligan, Senior Fellow at the Public Utility Research Center at the University of Florida, for her thorough review and helpful edits. The authors also thank Sanford Berg, Megan Silbert, and the participants at the 8th Organisation of Caribbean Utility Regulators (OOCUR) Annual Conference for their helpful comments on a much earlier version of this article.

I. Introduction

The winter of 2008–09 was brutal for many communities. Severe winter storms were reported in such diverse places as Las Vegas, South Mississippi, Kentucky, and Louisiana. Severe summer storms were likewise reported in 2008. For example, in August 2008, Tropical Storm Faye made landfall three times in Florida and Hurricane Gustav struck Haiti, Cuba, and finally made landfall in Louisiana.

The National Oceanic and Atmospheric Association (NOAA) collects data for property damage by each type of event by year. NOAA also collects estimates of property damage associated with weather events which will vary from year to year. Examples of property damage in the U.S. resulting from ice-related events and hurricanes in 2008 and

  doi:/10.1016/j.tej.2011.04.002

2009 illustrate that point. For ice-related events, property damage totaled almost $1.2 billion in 2009, but far less – $104 million – in 2008.[1] For hurricanes, the more treacherous year of the two was 2008 for which more than $7.1 billion in hurricane-related property damages was reported. In 2009, by contrast, estimated damages from hurricanes totaled less than $1 million.[2]

Those NOAA estimates include both insured and uninsured economic losses. Insured property losses may be easier to quantify because one can retrieve reports from insurance agencies. Much harder to quantify are ancillary losses such as those resulting from interruptions in electrical service that may not always be recovered from insurance. Ancillary losses tend to grow exponentially as an electric outage persists. An outage that persists for an hour or two may not result in ancillary losses. However, if it persists for hours or days, residential customers and businesses may lose perishable items through spoilage. Customers may incur expenses for the purchase of necessities such as batteries or potable water. Businesses may be forced to suspend operations and furlough their workers who, in turn, may suffer an interruption in their income. Customers with access to on-site generation will incur fuel expenses in order to run their generators. Although its estimate includes caveats, Lawrence Berkeley National Lab determined in 2005 an annual cost to U.S. consumers and businesses of $80 billion for both momentary and sustained (five minutes or more) power outages. The Lab's estimate attempts to capture the value customers place on outages which could capture ancillary losses, in addition to more easily quantifiable metrics. Of the estimated $80 billion in losses, sustained outages were responsible for a total of $26 billion at the time.[3]

The Lab's estimate attempts to capture the value customers place on outages which could capture ancillary losses, in addition to more easily quantifiable metrics.

In the aftermath of any storm event, there are inevitable questions. Customers ask why damage occurred and what, if anything, could have been done to prevent or reduce it. Customers and utilities seek means of better mitigating the effects of storm events in the future. Efforts to prepare for and prevent storm damage may either result from studies initiated by utilities or by public service commissions. Sometimes they result from a combination of both.

The purpose of this article is to describe a multi-year process that involved collaboration among electric utilities, the public service commission, and research institutions to improve preparations for future storms using Florida as a case study. Although Florida's storm hardening initiative focused on hurricanes, the same process could easily apply to other types of weather events such as ice storms, high winds, and thunderstorms. Moreover, the policy questions raised from the Florida case study would likewise apply to other types of storm hardening investigations.

II. The Call to Action in Florida

The impetus for regulatory action on Florida's storm hardening initiatives was a set of hurricanes that swept through the state in 2004–05, causing massive property damage and power outages in their wake. **Table 1** displays the damage and outage impacts of the 2004 and 2005 hurricanes. The total financial impact of customer power outages attributable to the 2004 hurricanes was $10.2 million. The cost of power outages in 2005 totaled $5.3 million.

Hurricane Andrew in 1992, which caused property damage totaling around $20 billion, was the most damaging hurricane to hit Florida before the 2004–05 hurricane seasons. Even before Andrew, it became clear that Florida lacked the resources and capability to respond adequately to a major disaster. Former Gov. Lawton Chiles appointed the

Table 1: Statewide Impact of 2004 and 2005 Hurricanes.

Hurricane	Charley (2004)	Frances (2004)	Ivan (2004)	Jeanne (2004)	Dennis (2005)	Katrina (2005)	Rita (2005)	Wilma (2005)
Category	4	2	3	3	3	2	2	3
Insured Damages[a]	$6.8 billion	$4.1 billion	$3.8 billion	$2.8 billion	$640 million	$468 million	$23 million	$6.1 billion
Customer Power Outages	$1.8 million	$4.5 million	$400,000	$3.5 million	$500,000	$1.2 million	$24,800	$3.6 million

Sources: Florida Division of Emergency Management, Hurricane Impact Report, A Summary, November 2004; and Draft Hurricane Report, Mar. 19, 2007.
[a] Insured damages include all insured property damages from the general public, including homes and businesses, as well as electric utility claims for insured facilities, such as power plants and office buildings. Not included is damage to investor-owned electric utility transmission and distribution facilities.

Governor's Disaster Planning and Response Committee to recommend measures to improve state responsiveness to disasters. The Committee made 94 recommendations to the legislature, most of which were enacted in 1993.[4] One of those measures established a state tax-exempt trust fund, the Florida Hurricane Catastrophe Fund. This fund reimburses or reinsures insurers for a portion of their losses from hurricane damage to residential property. Also prior to Andrew, the governor's office began hosting a hurricane conference each May to offer training sessions to first responders and an opportunity for them to share "best practices." The conference scheduled for May 2011 will represent the 25th such event. The Florida Legislative Office of Program Policy Analysis and Governmental Accountability (OPPAGA) – the legislature's oversight body – provides analysis and recommendations related to government agency operations and performance. OPPAGA issued a report in 1996 and a follow-up report in 1997 that examined the post disaster mitigation plans of local governments.[5]

In January 2006, utility regulatory oversight in Florida became, and it continues to be, a critical part of the statewide effort to develop policies and oversight mechanisms necessary to improve planning for and responses to hurricanes and other major disaster events. The Florida Public Service Commission (FPSC) adopted various measures, outlined below, to improve utility planning and response to disasters. However, it has not been the only state regulatory commission to do so. As was noted in a recent article on infrastructure hardening, regulators in North Carolina and South Carolina also initiated reviews of utility preparedness in the aftermath of severe ice storms.[6] As discussed below in the conclusion, the Maryland Public Service Commission is in the process of investigating the reliability and quality of service provided by the Potomac Electric Power Company (Pepco) in the aftermath of severe summer storms in 2010. What makes the Florida case study unique is that the docket for storm preparedness planning has spanned several years and is multi-faceted. It also has involved the active engagement of research institutions.

III. The Florida Public Service Commission's Actions

State public service commissions can use a variety of tools to compel utility action ranging from commission orders and rulemaking procedures to more bottom-up approaches such as staff workshops and collaborative research. The FPSC elected to use a mix of strategies. The FPSC issued orders and promulgated rules to establish the policy framework and expected outcomes but also authorized staff workshops and research to propel utility activity toward its prescribed goals. Following a staff workshop in January 2006, an internal meeting held on Feb. 27, 2006, set the framework for how the FPSC planned to proceed. The FPSC's order of April 25, 2006, subsequently outlined the expectations for the storm preparedness plans that the Florida electric utilities were

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required to file. These plans are the core of the FPSC's overall initiative to improve utility planning for and responsiveness to future storms. The FPSC docket requiring the plans has remained open under what is known as a "consummating order" that was issued on May 23, 2006.[7] The decision to keep that docket open suggests that the FPSC views the utility planning process as ongoing and subject to modification as needed.

Most of the actions taken by the FPSC to strengthen utility storm preparedness and planning occurred in 2006 and 2007 and several of the most significant actions are outlined in **Table 2.**

Table 2: Florida Public Service Commission's Actions toward Strengthening Storm Hardening

Date	Action	Brief Summary
Jan. 23, 2006	Held staff workshop involving state and local government officials, independent technical experts, and Florida electric utilities	• Discussed damage to electric utility facilities • Explored ways of mitigating future storm damage and outages
Feb. 27, 2006	Convened Internal Affairs meeting	• Heard staff recommended actions • Heard comments from other entities on staff proposal • Amended staff proposal and decided to - Require all Florida electric utilities, including municipal utilities and cooperatives, to provide a 2006 hurricane preparedness briefing -Require each investor-owned electric utility to file storm preparedness plans and provide implementation costs -Initiate rulemaking on distribution construction standards -Initiate rulemaking to identify areas and circumstances where distribution facilities must be constructed underground
Feb. 27, 2006	Issued order	Re: Each electric investor-owned utility to implement 8-year pole inspection cycle; requiring reports to be filed with the Division of Economic Regulation, FPSC, by Mar. 1 of each year
April 25, 2006	Issued order to require each investor-owned utility to file storm preparedness plans and estimated implementation costs for 10 initiatives. The plans must be filed on or before June 1, 2006.	The initiatives in the storm preparedness plans must include: • A three-year vegetation management cycle for distribution circuits • An audit of joint-use attachment agreements • A six-year transmission structure inspection program • Hardening of existing transmission structures • A transmission and distribution Geographical Information System • Post-storm data collection and forensic analysis • Collection of detailed outage data differentiating between the reliability performance of overhead and underground systems • Increased utility coordination with local governments • Collaborative research on effects of hurricane winds and storm surge • A natural disaster preparedness and recovery program
July 31, 2006	Adopted rules	Re: Revisions to requirements for annual distribution service reliability report filed by electric utilities to include extreme weather events such as hurricanes

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Table 2 (*Continued*)

Date	Action	Brief Summary
Aug. 7, 2006 (Verizon) Nov. 13, 2006 (Embarq) Jan. 15, 2010 (AT&T)	Issued orders following informal meeting and staff recommendations	Re: Local exchange telecommunications companies to implement 10-year wooden pole inspection program
Sept. 18, 2006	Issued order	Re: Review of all electric utility wooden pole inspection programs
Oct. 30, 2006	Held informal workshop	Re: All reports pertaining to utilities' reliability performance, including pole inspection data, storm hardening data, metrics for each storm hardening initiative, and annual reports on distribution service reliability
Nov. 23, 2006	Adopted rules following hearing	Re: Standards of construction – municipal electric utilities and rural electric cooperatives.
Jan. 16, 2007 (amended Jan. 17, 2007)	Adopted rules following two rule development workshops, orders noticing rulemaking and procedure, and several hearings.	Re: Placement of new electric distribution facilities underground, and conversion of existing overhead distribution facilities to underground facilities, to address effects of extreme weather events and overhead electric facilities to allow more stringent construction standards than required by National Electric Safety Code

IV. Collection and Analysis of Outage Data

The FPSC understood the importance of data collection and analysis for both oversight and planning and developed a framework for grounding regulatory and utility decision-making on evidence-based findings. To improve regulatory analysis, the FPSC initiated a rulemaking proceeding in 2006 to amend utility data collection and reporting requirements. Prior to the 2004 and 2005 hurricanes, Florida's investor-owned electric utilities were required to report annually information that was used to assess distribution service reliability and changes in quality of service. Outage information has been and continues to be part of the electric utilities' annual reliability reports to the FPSC. However, the outage data reported by utilities until the rules were amended in 2006 after the 2004 and 2005 hurricanes, excluded storm events such as hurricanes. Exclusions of this sort made the data far less useful in the context of storm preparedness. FPSC staff noted that "the amount of 2004 hurricane outage data that has been excluded has been so great that it represents up to 98 percent of outage data. Reports excluding hurricane outage data offer little information about the level of reliability experienced by utility customers."[8]

The FPSC rulemaking process on distribution service reliability involved a staff rulemaking workshop which was attended by representatives of each investor-owned electric utility, the Florida Electric Cooperatives Association, and the Office of Public Counsel. Following the workshop and associated testimony, the FPSC issued an order with its amended rule. Now each investor-owned utility must keep the records and data supporting its annual report for a minimum of 10 years. This 10-year period is based upon the maximum inspection cycle of distribution facilities that are implemented by the investor-owned utilities.

Investor-owned utilities are also required to report both raw and adjusted data (excluding major storm events) so that the FPSC is better positioned to analyze changes in performance that may indicate a need for further work.[9] Not only can the data be used to gauge year-to-year comparisons but they can also be used to compare reliability among Florida electric utilities. The use of audits looms large if an observed pattern in reliability performance and a reported trend in customer complaints would justify it.

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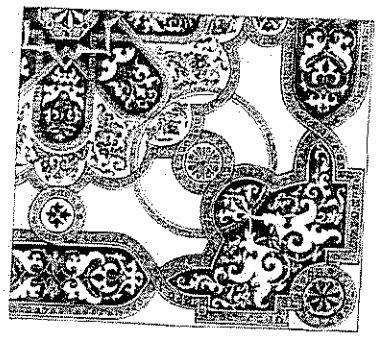
V. Utility Plans

Not only do regulators benefit from improved data collection and analysis, but so do utilities in developing their own plans for responding to storm events and assessing the impacts of such events. Florida's utilities are required to include updated information on their storm hardening activities in the same document in which they report their annual reliability data. The FPSC reviews the utilities' annual reports and then issues a report with its findings.[10]

In the initial stages of the storm hardening initiative, the FPSC seemed to recognize the difficulty of determining what data would be needed to inform utility investments in storm hardening. It also was not always clear how best to gather the data. The sharing of best practices and efforts involving data collection and analysis often require collaborative research that may be best achieved in non-adversarial settings with the active participation of research institutions. Of the 10 measures to be addressed in utility plans, as outlined in the FPSC's order of April 25, 2006, at least four – vegetation management, data collection to inform undergrounding decisions, data collection on the effects of wind and storm surge, and post-storm data collection and forensic analysis – seemed to fit in that category.

In its order (April 25, 2006) requiring investor-owned utilities to develop storm implementation plans, the FPSC noted the importance of a centrally coordinated research and development effort:

> Florida would be better served by consolidating utility resources through a centrally coordinated research and development effort with universities as well as research organizations. The purpose of such effort would be to further the development of storm resilient electric utility infrastructure and technologies that reduce storm restoration costs and outages to customers.[11]



The investor-owned utilities were required to establish a plan to increase collaborative research, solicit participation from municipal utilities and rural electric cooperatives, and participate in funding the research effort. Although the FPSC's suggestion for collaboration in the April 2006 order applied specifically to research on the effects of hurricane winds and storm surge, it quickly became clear that there were other research applications for which collaborative efforts made good sense.

The Public Utility Research Center (PURC) at the University of Florida emerged as a suitable academic institution to facilitate and contribute to the research effort that would inform utility storm hardening plans. To formalize the collaborative effort, the investor-owned utilities joined forces with Florida's municipal utilities and rural electric cooperatives to form a steering committee. That committee entered into a memorandum of understanding with PURC. Under PURC's auspices, progress was made on three general fronts: vegetation management, data collection and the evaluation of hurricane wind effects, and development of a model to assess the costs and benefits of undergrounding infrastructure investments. Summaries of the outcome of the joint effort with PURC follow.

A. Vegetation management

Vegetation management techniques are applied to mitigate the effects that trees and other growth can have on overhead power lines, transformers, and other facilities of the utility infrastructure. These mitigation strategies are particularly useful during wind storms, when flying debris poses additional hazards to property. The FPSC's April 25, 2006, order

noted that "the vegetation management practices of the investor-owned electric utilities do not provide adequate assurance that tree clearances for overhead distribution facilities are being maintained in a manner that is likely to reduce vegetation related storm damage."[12] The order recommended that the utilities develop more stringent vegetation management programs. PURC convened workshops in March 2007 and January 2009 to foster exchanges among participants regarding practices that could improve vegetation management. In these workshops, participants shared ideas on the frequency of tree trimming (often referred to as cycles), trimming techniques, policies to encourage public participation and cooperation in management programs, and ways of promoting municipal involvement at the local and state level. Investor-owned utilities are required to have three-year trim cycle plans, and municipal utilities and rural electric cooperatives are required to include information about their vegetation management efforts in annual reports to the FPSC.

B. Hurricane wind effects

Storm hardening depends on an understanding of wind characteristics in severe storms and the effects of strong winds under different weather conditions on electric utility facilities. Two types of data are therefore involved. First, data must be gathered for relevant wind characteristics. Second, data must be collected after severe storms for forensic analysis. To obtain data on wind characteristics, PURC oversaw research conducted at the University of Florida's Civil and Coastal Engineering Department and Weatherflow, a company that

monitors, models, and forecasts wind for specific applications. This collaborative research effort promoted the deployment of 50 high-resolution wind monitoring stations, some on property provided by the utilities. These stations allow for the ongoing collection of data on wind direction and speed, temperature, and barometric pressure.

To develop capability for forensic analysis of post-storm wind data, PURC, in cooperation with the participating utilities, developed a uniform forensics data-gathering system. The post-storm data will be used in conjunction with the high-resolution wind data collected from the monitoring stations to enable utilities to identify locations where utility property is at relatively greater risk for damage. Such areas could be targeted for preventative maintenance, thereby improving reliability of the utility system.

C. Undergrounding model

The FPSC's April 25, 2006, order required the investor-owned utilities to collect detailed outage data that differentiate between the reliability performance of overhead and underground facilities. The data are needed for consumers, communities, and utilities to consider storm hardening options, including undergrounding. Investments in underground facilities come with both costs and benefits, some of which are difficult to quantify. For example, the relocation of power lines does not really eliminate the risk of storm-related damage, it simply reduces the potential damage from wind and increases the potential damage from storm surge and flooding. Understanding how this damage distribution changes relative to the costs to implement these changes is critical to decisions that provide benefits to the utility and its customers. Economic models are often used to shed light on costs and benefits. After conducting survey research to determine that a satisfactory model did not exist, a consortium of Florida's electric utilities contracted with PURC and

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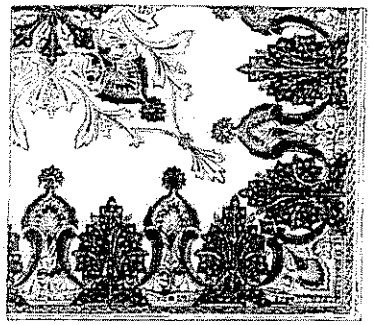
Quanta Technology to begin development of a model. The result of that collaboration was an underground assessment model. Since the model's initial construction, the utilities have continued to work with PURC to test, verify, and expand the model's capabilities.

The testing process convinced the utility consortium that it was difficult to evaluate the accuracy of damage estimates resulting from an average hurricane year, the common denominator of the model. Utilities tend to track damage on an annual, or per storm, basis. However, an average hurricane year in the state of Florida equates to approximately 0.79 storms and therefore never actually occurs. As a result, the damage results coming from the initial Quanta model, while useful for performing comparative analyses among utilities, did not correspond to actual data on utility damages. The utilities and PURC subsequently concluded that it would be useful to simulate historical storms as a means of assessing the plausibility of the damage estimates produced by the model. PURC refined the model by adding the capability to simulate historical storms, as well as the capability to conduct scenario analyses with the existing storm data. The refined model can therefore simulate, for example, the effects of a particular storm, such as Hurricane Andrew, on a particular project area. This capability is important for testing the reasonableness of the model results. While the damage for an "average" storm year is an important output metric from the model, the fact remains that utilities do not observe damage in an average storm year, that is, a year in which Florida is affected by 0.79 hurricanes. They only observe damage data from particular storms. The model can also



simulate the effects of a particular type of storm, such as a Category 4 hurricane, on a given area of the state.

VI. An Alternative Approach

The Florida case study presents the example of a process that attempted to improve planning, and decision making about costs and benefits associated with investments in storm hardening with the goal of preserving the reliability of the power system. It required extensive data gathering and analysis, collaboration with research institutions, and coordination with local governments. Additional data gathering and improvements to analytical tools, such as the undergrounding model described above, will result in even more improvements in the future.

A somewhat different approach to improving storm preparedness was recommended in a Guest Editorial (Rokach 2010) that recently appeared in *The Electricity Journal*, "What Maryland Can Learn from Mississippi."[13] The context for Rokach's article was the following: In the wake of rain storms accompanied by high winds, the Potomac Electric Power Company (Pepco) reported three power outages in July and August 2010 that affected a total of 470,000 customers in Maryland.[14] Customers also complained about Pepco's failure to communicate while these outages were occurring, an apparent failure of the company's automated communications system. The Maryland Public Service Commission responded by initiating an investigation in the aftermath of the storms to assess the reliability and quality of Pepco's response.[15]

Mr. Rokach was not a party to the Pepco proceeding but offered these insights as someone with extensive Federal Energy Regulatory Commission and energy-related legal experience. In his article, Rokach recommended that the Maryland Commission consider a broad regulatory framework that would include performance-based rates,

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improved customer communications, informed pricing decisions for hardening investments, and more rigorous reliability standards. He suggested the performance-based rate scheme that was used in Mississippi in the early 1990s should be considered for Maryland for Pepco. A law review article referenced by Mr. Rokach explains how the Mississippi incentive rate plan, known as a Performance Evaluation Plan, actually worked for Mississippi Company Power.[16] It used a formulary earned rate of return that adjusted for utility performance in price, customer satisfaction, and service reliability. The challenge for regulators is to find the right balance to provide utilities with rewards and penalties without creating opportunities for them to manipulate the system.[17]

The Maryland Public Service Commission's approach is different in some important respects from Florida's approach. Maryland's order is focused on Pepco's actual responses to a past set of events, specifically power outages that occurred on three dates in July and August 2010. Florida's strategy, by contrast, was forward looking and was not an investigation of past events. Maryland's effort appeared to be triggered, at least in part, by customer complaints, whereas the activities of the FPSC grew out of a broader state-wide focus on disaster preparedness.

There are also some important differences between Rokach's recommendations for Pepco and Florida's approach. Florida's overall strategy did not include changes in ratemaking. It also did not focus on improved communications with retail consumers although data on storm-related customer complaints must be included in utility annual reliability reports. Presumably, if the data indicate upward trends in consumer complaints, the FPSC can take further action.

The policy questions generated by the discussion above are as follows: (1) Is a retrospective approach to identification of appropriate elements for a mitigation plan more efficient than a prospective, model-based

Florida's strategy was forward looking and was not an investigation of past events.

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approach? (2) Should performance-based rates of the type recommended by Rokach for Pepco, and used in Mississippi, be part of a comprehensive strategy to improve electric utility reliability and storm hardening or would the assessment of such rates be "overkill"? (3) What is the best way for the regulatory body to oversee and evaluate the efficiency and effectiveness of storm preparedness activities? For example, is there a more effective tool than a formal docket of indeterminate duration with which to improve reliability and responsiveness? (4) As research on storm hardening was funded by participating utilities in the Florida approach, should utility investments in storm hardening research be evaluated and, if so, how? Should such investments be included in the ratebase absent an evaluation? There did not appear to be a requirement for a third-party evaluation of the research in the memorandum of understanding with PURC. (5) What should be the objective of planning to mitigate adverse impacts of storms and other disasters: improved system reliability; improved infrastructure deployment and location decisions; or minimizing costs associated with redundancy and backup facilities, or a combination thereof?■

Endnotes:

1. NOAA Economics, *Extreme Events, Snow and Ice*, at http://www.economics.noaa.gov/?goal=commerce&file=events/snow.

2. NOAA Economics, *Extreme Events, Hurricane and Tropical Storm*, at http://www.economics.noaa.gov/?goal= commerce&file=events/hurricane.

3. The methodology used to derive the estimate was explained as follows: "The Berkeley Lab study aggregates the best available data from three sources: surveys on the value electricity customers place on uninterrupted service, information recorded by electric utilities on power interruptions, and information from the U.S. Energy Information Administration on the number, location and type of U.S. electricity customers. Based on the data available, the researchers divided power interruptions into those that last less than five minutes, and those that are longer. The longer interruptions are generally characterized by their duration (length of time of each interruption), and frequency (number of interruptions per service territory)." *See* Robert Longley, *Power Interruptions Cost Nation $80 Billion Annually: Berkeley Lab Study Focuses on State of U.S. Power Grid*, ABOUT.COM GUIDE, Feb. 2005, at http://usgovinfo.about.com/od/consumerawareness/a/poweroutcosts.htm.

4. Dr. Lynn Leverty, *Plan, Rescue, Recover, and Reassess: Coordinating Responses to Hurricanes in Florida*, The Reubin O'D. Askew Institute on Politics and Society, Spring 2006, at 20.

5. Florida Legislative Office of Program Policy Analysis and Government Accountability, *Follow-Up Report on Post-Disaster Relocation and Reconstruction*, No. 97-19 (1997), at http://www.oppaga.state.fl.us/Reports/pdf/9719rpt.pdf.

6. Miki Deric, Tom Kirkpatrick and Calvin Stewart, *Tough Enough?*, ELEC. PERSPECTIVES, (2010), at 32–33, at http://www.daviescon.com/aboutSubPub.html.

7. *See* FLA. PUB.SERV. COMM'N, DOCUMENT DETAIL FOR DOCUMENT NO. 060198, at http://www.floridapsc.com/dockets/cms/docketFilings3.aspx?docket=060198 [the entire record of filings under the open docket.]

8. *Id., Memorandum re: Docket No. 060243-EI-Proposed Revisions to Rule 25-6.044, F.A.C., Continuity of Service, and Rule 25-6.0455 F.A.C.*, May 25, 2006, at 2, at http://www.floridapsc.com/library/FILINGS/06/04544-06/04544-06.PDF.

9. FLORIDA RULES R. 25-6.0455 (Aug. 17, 2006). This rule [Annual Distribution Service Reliability Report] applies to all electric utilities but the requirements are fewer for utilities furnishing electric service to fewer than 50,000 retail customers.

10. *See* FLA. PUB. SERV. COMM'N, ELECTRIC UTILITY DISTRIBUTION RELIABILITY REPORTS, at http://www.floridapsc.com/utilities/electricgas/distributionreports.aspx. [annual distribution service reliability reports with the aggregated utility filings and the FPSC's review of those reports.]

11. *Id., In re* Requirement for investor-owned electric utilities to file ongoing storm preparedness plans and implementation cost estimates, *Notice of Proposed Agency Action, Order Requiring Storm Implementation Plans*, Docket no. 060198-EI, April 25, 2006, at 9, at http://www.floridapsc.com/library/FILINGS/06/03645-06/03645-06.PDF.

12. *Id.*, at 4.

13. Joshua Z. Rokach, *What Maryland Can Learn from Mississippi*, 23 ELEC. J. 10 (2010), 82–84.

14. *Id.*, 297,000 customers on July 25, 2010, 75,000 customers on Aug. 5, 2010, and 98,000 customers on Aug. 12, 2010.

15. MD. PUB. SERV. COMM'N, *In re* Investigation into the Reliability and Quality of the Electric Distribution Service of Potomac Electric Power Company, Case No. 9240, *Order* 83552, Aug. 26, 2010.

16. C.L. Hebert, *The Quest for an Incentive Utility Regulatory Agenda*, 19 ENERGY L.J. 1, 14–19 (1998).

17. *Id.*, at 16.

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InfraSource

Undergrounding Assessment Phase 1 Final Report:

Literature Review and Analysis of Electric Distribution Overhead to Underground Conversion

Prepared for: Florida Electric Utilities

Prepared by: InfraSource Technology

Contact: Richard Brown, PhD, PE
richard.brown@infrasourceinc.com
4020 Westchase Blvd., Suite 375
Raleigh, NC 27607
919-961-1019 (V)
610-757-1705 (F)

February 28th 2007

Executive Summary

The conversion of overhead electric power distribution facilities to underground has been a topic of discussion in Florida for more than twenty years. The topic has been studied, discussed, and debated many times at the state, municipal, and local levels. Overhead construction is the standard in Florida, but all investor-owned utilities are required to have a process where customers can opt to underground existing overhead service by paying the incremental cost. For municipals and cooperatives, the decision to underground is left to local citizen boards.

This report presents the results of a review of relevant previous undergrounding studies done in Florida as well as literature on the subject from throughout the US and around the world. This review finds that the conversion of overhead electric distribution systems to underground is costly, and these costs are far in excess of the quantifiable benefits presented in existing studies, except in rare cases where the facilities provide particularly high reliability gains or otherwise have a higher than average impact on community goals.

This conclusion is reached consistently in many reports, which almost universally compare the initial cost of undergrounding to the expected quantifiable benefits. No prior cost benefit study recommends broad-based undergrounding, but several recommend targeted undergrounding to achieve specific community goals.

All numbers quoted throughout this report appear in one or more of the reports cited.[1]

Undergrounding is Expensive

As a rough estimate, the cost of converting existing overhead electric distribution lines and equipments to underground is expected to average about $1 million per mile. In addition there are costs required to convert individual home and business owner electric service and meter facilities so they will be compatible with the new underground system now providing them with electricity. Further, there are separate, additional costs associated with site restoration and placing third-party attachments underground.

When only considering the direct utility cost of a conversion from overhead to underground, studies find that undergrounding distribution facilities in residential neighborhoods served by investor-owned utilities in Florida would cost an average of about $2,500 per residential customer affected. Undergrounding residential main-trunk feeders (those lines leading to residential neighborhoods) throughout Florida would cost an average of about $11,000 per residential customer affected. Undergrounding all main trunk commercial feeders (those feeding business and office areas, etc.) in Florida would cost an average of about $37,000 per commercial customer affected.

Costs in any particular situation could vary widely from these estimates depending upon electric system design, construction standards, customer density, local terrain, construction access issues, building type, and service type. Existing studies estimate the wholesale conversion of overhead electric distribution system to underground would require that electricity rates increase to approximately double their current level, or possibly more in areas with a particularly low customer density.

[1] References are intentionally left out of this Executive Summary. They are included throughout the main body of the report.

Further Costs Must Be Incurred to Obtain Complete Aesthetic Benefits

Nearly every study and examination of overhead to underground conversion notes in some manner that removing the poles, overhead lines and equipment, and in some cases above-ground facilities required for the overhead utilities will improve the visual appeal – the aesthetics – of an area, be it residential or commercial property. Opinions and analytical studies of the value of this aesthetic improvement differ widely as to results, but no studies examined in this report conclude that aesthetics had a *quantifiable* monetary benefit that substantially affected the overall benefit-to-cost ratio for the conversion.

Regardless, there is no doubt that some municipal governments, developers, businesses, and homeowners value the aesthetic improvement brought about by undergrounding of utilities very highly. This is evident because some choose pay the cost differential for underground service themselves (for new construction).

The electric system conversion costs discussed above would *not* always provide aesthetic improvement without additional expenses to convert third-party utilities such as telephone and cable television to underground. The costs necessary to relocate all remaining utilities underground is most often estimated at somewhere between 10% and 30% beyond the cost of the electric conversion.

Undergrounding Provides a Number of Benefits

In return for the considerable expense, electric customers can receive a number of potential benefits from the undergrounding of their overhead systems. The following is a list of benefits most often mentioned in undergrounding reports and studies:

Potential Benefits of Underground Electric Facilities

- Improved aesthetics;
- Lower tree trimming cost;
- Lower storm damage and restoration cost;
- Fewer motor vehicle accidents;
- Reduced live-wire contact;
- Fewer outages during normal weather;
- Far fewer momentary interruptions;
- Improved utility relations regarding tree trimming;
- Fewer structures impacting sidewalks.

Undergrounding Has a Number of Potential Disadvantages

There are a number of potential disadvantages which need to be considered whenever the conversion of overhead facilities to underground is evaluated. The following is a list of potential disadvantages most often mentioned in undergrounding reports and studies:

Potential Disadvantages of Underground Electric Facilities

- Stranded asset cost for existing overhead facilities;
- Environmental damage including soil erosion, and disruption of ecologically-sensitive habitat;
- Utility employee work hazards during vault and manhole inspections;
- Increased exposure to dig-ins;
- Longer duration interruptions and more customers impacted per outage;
- Susceptibility to flooding, storm surges, and damage during post-storm cleanup;
- Reduced flexibility for both operations and system expansion;
- Reduced life expectancy
- Higher maintenance and operating costs;
- Higher cost for new data bandwidth.

Financing Options

The reports and references reviewed in this report all conclude that undergrounding incurs a very substantial additional cost compared to that for overhead distribution, even as they differed on what that cost was and how much of it was justified based on the benefits obtained. Ultimately, those undergrounding costs must be paid if the conversion is to be done. There are many funding options to cover these costs, and selecting the most appropriate financing approach is a critical part of the overall undergrounding process. The following are methods of financing that are most often cited in reports and studies (combinations of these options can be used as well):

Basic Financing Options

- Customer funded;
- Higher electricity rates;
- Higher taxes;
- Special tax districts;
- Utility set-asides;
- Federal funding;
- Private sector funded.

Overall Conclusion

The Florida Public Service Commission as well as many municipalities and electric customers in Florida are interested in undergrounding electric distribution systems in order to improve aesthetics, improve reliability of service, and reduce vulnerability to hurricane damage. The benefits associated with improved aesthetics are not quantifiable. Without considering aesthetics, no study reviewed in this report concludes that wholesale conversion of overhead electric distribution lines to underground can be fully cost justified.

In summary, a review of the body of public knowledge on the undergrounding of electric distribution facilities reveals the following:

Summary of Literature Review on Electric Distribution Underground Conversion

- No state is requiring extensive undergrounding of existing distribution facilities;
- Conversion of overhead facilities to underground is rarely 100% justified on the basis of costs and quantifiable benefits;
- *Ex post* analyses on actual underground conversion projects have not been done;
- Few studies address the potential negative impacts of undergrounding;
- Few studies consider strengthening existing overhead systems as a potential cost-effective alternative to underground conversion;
- There are almost no academic or industry publications that address storm reliability modeling of electric distribution systems;
- Until last year, there was no academic or industry literature that addressed failure rates during hurricanes as a function of hurricane strength;
- Existing research on mitigating the impacts of major storms on electric distribution systems is not sufficient for use in a detailed study.

InfraSource

Final Report

Undergrounding Assessment Phase 2 Report: Undergrounding Case Studies

Prepared for: Florida Electric Utilities

Prepared by: InfraSource Technology

Contact: Richard Brown, PhD, PE
richard.brown@infrasourceinc.com
4020 Westchase Blvd., Suite 375
Raleigh, NC 27607
919-961-1019 (V)
610-757-1705 (F)

August 6th 2007

InfraSource

Executive Summary

This report presents the results of Phase 2 of a three phase project to investigate the implications of converting overhead electric distribution systems in Florida to underground (referred to as undergrounding). The purpose of Phase 2 is to examine the costs and benefits of actual undergrounding projects that have been completed. The focus is to identify the drivers of each project; discuss the challenges of each project; and to collect data that can serve as a real-world basis for the *ex ante* modeling in Phase 3. A summary of the four case studies examined in Phase 2 is shown in Table A.

Table A. Summary of Case Studies

Project	Utility	Year of Conversion	Circuit Miles of Converted Overhead	Circuit Miles of New Underground
Pensacola Beach	Gulf Power	2006	2.6	6.8
Sand Key	Progress Energy Florida	1996	1.8	1.7
Allison Island	Florida Power & Light	2000	0.5	1.0
County Road 30A	Chelco	2006	0.8	0.8

A review of the case studies reaches the same conclusion reached in the Phase 1 literature review: the initial cost to convert overhead distribution to underground is high, and there is insufficient data to show that this high initial cost is 100% justifiable by quantifiable benefits such as reduced O&M cost savings and reduced hurricane damage. Increased data collection can potentially increase the amount of quantifiable benefits, but it is unlikely that these benefits will 100% justify high initial cost, except potentially in a situation where an undergrounded system is struck by multiple severe hurricanes. For all of these case studies, by far the strongest reason for undergrounding is to improve the aesthetics of the area. Additional observations relating to these case studies include:

- All case studies occurred in coastal areas.
- Two of the four projects were done in conjunction with roadway widening projects.
- More circuit miles of underground are sometimes built than the original overhead amount. This is typically to create an underground loop that increases operational flexibility and the ability to respond to faults.
- Cost per circuit mile figures corresponds to those identified in the Phase 1 literature search.
- Cost per customer varies widely based on both the cost per circuit mile and the amount of high density housing such as high rise condominiums.

Not much data is available on the impact of the case studies on non-storm reliability and hurricane performance. The little data that is available indicates that non-storm reliability is not significantly different after undergrounding, and that hurricane reliability of underground systems is not perfect due to storm surge damage.

For these case studies, there is an extensive amount of project description and project cost data, but limited avoided cost and benefit data. These case studies can certainly be used as an input for an *ex ante* model, but there is not sufficient data to compare the output of the *ex ante* model to historical realized benefits. There is not even enough data to determine upper and lower bounds of potential results. At this point, any *ex ante* model that is developed, such as the one to be developed in Phase 3, must be justified by its model assumptions rather than by its ability to replicate realized benefits from any of these case studies.

7 Conclusions

A summary of the underground conversion case studies is shown in Table 7-1. This table primarily includes information from the "general data" category, but also supplies some targeted cost and performance results.

Table 7-1. Underground Conversion Case Study Summary Table

Description	Allison Island	Sand Key	Pensacola Beach	Conner Road 30A
Year of Conversion	2000	1996	2006	2006
Utility	Florida Power & Light (IOU)	Progress Energy Florida (IOU)	Gulf Power (IOU)	Chelco (cooperative)
Voltage	13.2 kV	12.47 kV	12.47 kV	12.5 kV
Customers				
Residential	45	3,191	849	1,200
Commercial	0	184	402	0
Total	45	3,375	1,251	1200
Old OH Circuit Miles	0.5	1.8	2.55	0.8
New UG Circuit Miles				
Three Phase	0.0	1.7	6.56	0.8
Two Phase	1.0	0.0	0.04	0.0
One Phase	0.0	0.0	0.06	0.0
Total	1.0	1.7	6.84	0.8
Construction Type	Direct buried duct	Cable in conduit	Concrete ductbank	Cable in conduit
Level of Urbanization	High density urban (expensive housed)	High density urban with mostly high rise condos	High density urban with condos, houses, and commercial mix	Suburban
Geography	Coastal	Coastal	Coastal	Coastal
Primary Motivation	Aesthetics	Aesthetics	Aesthetics	Aesthetics
Road widening involved	No	Yes	Yes	No
Initial UG cost[1]	$207,401	$1,490,528	$4,300,000	$706,776
O&M cost savings	(not available)	$1,349 per year	(not available)	$120 per year
Initial Cost per Mile[1,2]	$414,802	$917,532	$1,686,275	$883,470
Initial Cost per Customer[1]	$4,609	$489	$3,437	$589
Hurricane performance	Not known	1997 storm caused surge damage to new system	2005 storm caused 1/3 of poles to fail	Too early to tell
SAIDI Impact	Not known	No change	Too early to tell	Too early to tell

Notes
1. Initial cost includes all available initial cost data, which includes different items for the different cases
2. Initial cost per mile is based on the original amount of overhead circuit miles

A review of Table7-1 brings one to the same conclusion reached in the Phase 1 literature review: the initial cost to convert overhead distribution to underground is high, and there is insufficient data to show that this high initial cost is 100% justifiable by quantifiable benefits such as reduced O&M cost savings and reduced hurricane damage. Increased data collection can potentially increase the amount of quantifiable benefits, but it is unlikely that these benefits will 100% justify high initial cost, except potentially in a

situation where an undergrounded system is struck by multiple severe hurricanes. For all of these case studies, by far the strongest reason for undergrounding is to improve the aesthetics of the area.

A summary of observations about the similarities and differences of the four case studies is now provided:

Observations

1. All case studies occurred in coastal areas.
2. All case studies were motivated primarily by aesthetic considerations.
3. More circuit miles of underground are sometimes built than the original overhead amount. This is typically to create an underground loop that increases operational flexibility and the ability to respond to faults.
4. No industrial customers were affected by any of the case studies.
5. The two larger case studies in terms of circuit miles were done in conjunction with roadway widening projects. The two smaller projects were not.
6. Cost per circuit mile varies widely based on a variety of factors, including the ratio of initial overhead circuit miles to new underground circuit miles. Cost per mile figures are consistent with those identified in the Phase 1 literature search.
7. Cost per customer varies widely based on both the cost per circuit mile and the amount of high density housing such as high rise condominiums.

Not much data is available on the impact of the case studies on non-storm reliability and hurricane performance. The little data that is available indicates that non-storm reliability is not significantly different after undergrounding, and that hurricane reliability of underground systems is not perfect due to storm surge damage.

The primary goal for Phase 2 is to collect data suitable for use in Phase 3. A review of the case studies shows that there is an extensive amount of project description and project cost data, but limited avoided cost and benefit data. These case studies can certainly be used as an input for an *ex ante* model, but there is not sufficient data to compare the output of the *ex ante* model to historical realized benefits. There is not even enough data to determine upper and lower bounds of potential results. At this point, any *ex ante* model that is developed, such as the one to be developed in Phase 3, must be justified by its model assumptions rather than by its ability to replicate realized benefits from any of these case studies.

Final Report

Undergrounding Assessment Phase 3 Report: *Ex Ante* Cost and Benefit Modeling

Prepared for: Florida Electric Utilities

Prepared by: Quanta Technology

Contact: Le Xu, PhD
lxu@quanta-technology.com

Richard Brown, PhD, PE
rbrown@quanta-technology.com
4020 Westchase Blvd., Suite 300
Raleigh, NC 27607
919-334-3021 (Office)
610-757-1705 (Fax)

May 21st 2008

Executive Summary

This report is the Phase 3 deliverable of a project awarded in response to RFP #U-1 issued by the Florida Electric Utilities. RFP #U-1 was a result of Florida Public Service Commission Order No. PSC-06-0351-PAA-EI, which directs each investor-owned electric utility in Florida to establish a plan that increases collaborative research to further the development of storm-resilient electric utility infrastructure and technologies that reduce storm restoration costs and interruptions to customers. Municipal electric and cooperative electric utilities are participating voluntarily.

The scope of the overall project (all three phases) is to investigate the implications of converting overhead electric distribution systems in Florida to underground (referred to as undergrounding). The primary focus of the project is the impact of undergrounding on the performance of the electric infrastructure during hurricanes, which is the ability of the local power system to withstand high winds, storm surges, and other damage from hurricanes and to minimize the number and duration of customer interruptions. This study also considers benefits and issues with regards to performance during non-storm situations.

The project is divided into three phases. Phase 1 is a meta-analysis of existing research, reports, methodologies, and case studies. The Phase 1 final report, *Undergrounding Assessment Phase 1 Final Report: Literature Review and Analysis of Electric Distribution Overhead to Underground Conversion*, was issued on February 28th 2007. Phase 2 examines specific undergrounding project case studies in Florida. The Phase 2 final report, *Undergrounding Assessment Phase 2 Final Report: Undergrounding Case Studies*, was issued on August 6th 2007.

Phase 3 develops and tests a methodology for analyzing the costs and benefits of specific undergrounding proposals in Florida. The methodology is separated into two basic components: normal weather assessment and hurricane assessment. The normal weather model includes the basic cost of utility capital and operational cost information. It also includes high-level reliability information that allows for the calculation of customer interruption information and related costs. A flowchart of the methodology is shown in Figure A-1.

The hurricane model determines infrastructure damage and related costs associated with tropical storms of hurricane strength when making landfall in Florida. To perform a cost and benefit analysis of sufficient detail to meet the objectives of this project, it is necessary to simulate hurricanes moving across Florida. Therefore, a large component of the hurricane model is dedicated to simulating hurricane years. For each year of simulation, the number of landfall hurricanes is randomly determined based on historical hurricane data. For each hurricane (if any), the landfall location, direction, speed, strength, and other parameters are also randomly determined based on historical hurricane data.

When a hurricane makes landfall, a storm surge model determines the amount of infrastructure damage that occurs in susceptible areas due to the wall of water (i.e., storm surge) that the hurricane pushes onto coastal areas.

As the hurricane travels over land, the simulation model keeps track of the fastest wind gusts to which each location is exposed. This determines the amount of wind damage that occurs during the hurricane. The model is flexible enough to consider many types of construction with many types of wind loading characteristics. This includes standard construction (e.g., Grade B, Grade C), "hardened" systems, and others.

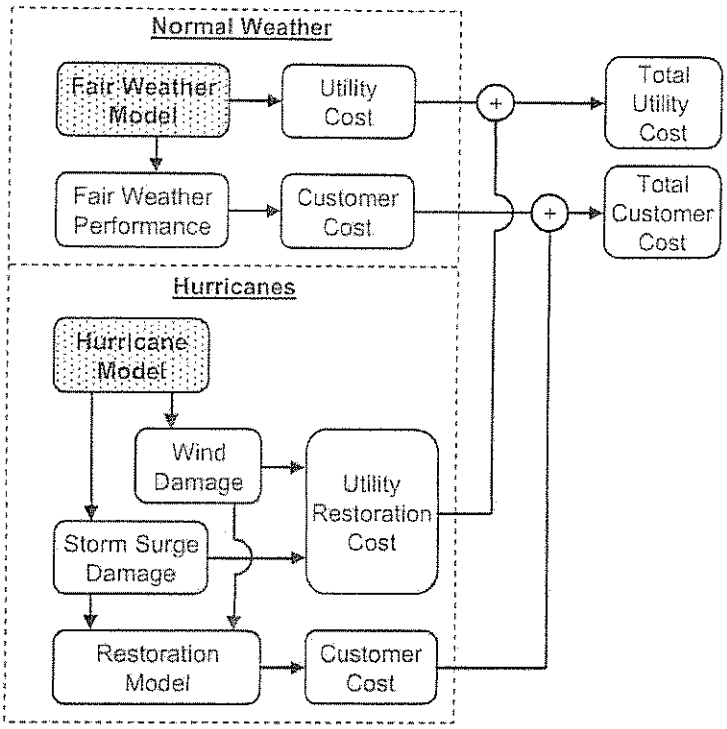

Figure A-1. Overview of Methodology

For each simulated hurricane, the model determines the amount of damage both for the proposed project area and for the entire service territory of the associated utility. Damage for the entire service territory is needed to determine the total utility restoration time, which then determines the restoration time for the proposed project area.

Once the total hurricane damage is determined for the entire project area, a restoration model is used to determine when repairs on the proposed project area begin and end. This restoration model includes factors such as startup inefficiencies (e.g., due to debris on roads), crew ramp up, and the difference between overhead crews and underground crews.

The hurricane damage and restoration models provide information that allows for the calculation of utility restoration costs, customer interruptions, and the customer costs associated with the interruptions. Taken together, the utility and customer costs constitute the total costs of the hurricane as it relates to electric utility infrastructure.

After simulating the costs and benefits of all hurricanes in a specific hurricane year, additional hurricane years can be simulated. Many simulated years will have no hurricanes and will therefore have no hurricane costs. Some simulated years will have a single weak hurricane and will therefore have small hurricane costs. Some simulated years will have multiple major hurricanes and will therefore have significant hurricane costs. Simulating many hurricane years allows the average hurricane cost to be computed.

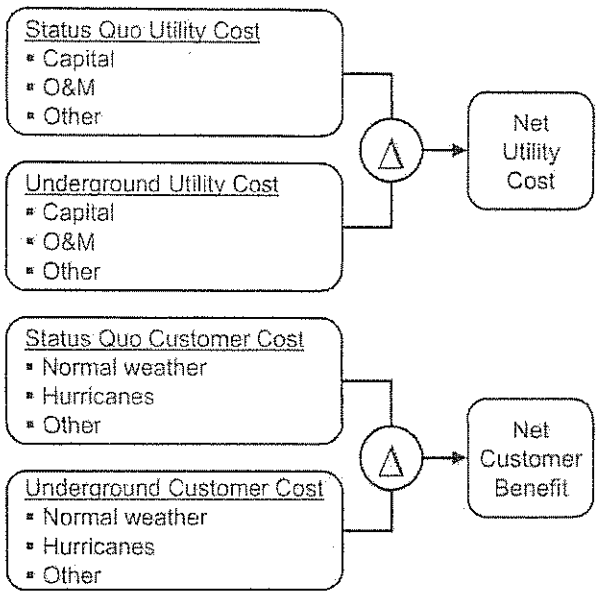

Figure A-2. Approach to Cost and Benefit Calculations

The output of the simulation is a list of initial utility costs, annual utility costs, customer interruption minutes during normal weather, and customer interruption minutes during hurricanes. The model is flexible enough to accommodate any cost category that can be characterized by initial cost and/or a recurring annual cost.

The model is designed to compare two cases. Typically, this will be the "status quo" case and a proposed undergrounding option. Hurricane simulations are performed automatically for both cases so that costs and reliability differences can be compared. This approach is shown in Figure A-2.

Consider a situation where a utility is considering an undergrounding project. When assessing this project, the utility will first enter information about the existing system. This allows the current utility costs, reliability performance, and customer costs to be calculated. The utility also enters information about the undergrounding project including the initial cost, annual costs, annual savings, and so forth. The assessment is then able to simulate the performance of the undergrounded system and compute associated utility costs, reliability performance, and customer costs. The difference in utility cost between the status quo and the proposed scenario is defined as the net utility cost. The difference in reliability performance is defined as net reliability benefit. When reliability benefit is translated into customer cost, it is defined as net customer cost. Net reliability benefit and net customer cost, taken together, constitute net customer benefit.

The scenario comparison in Figure A-2 is flexible and does not necessarily have to be used to compare the status quo to a proposed underground project. For example it could be used to compare the status quo to a proposed "hardened overhead" project where existing overhead structures are reinforced to better withstand wind damage. It could also be used to compare a proposed undergrounding project to a proposed hardened overhead project. Generally, the framework is suitable to compare any given "Scenario A" with another given "Scenario B." This allows a range of options to be explored and compared based

on their incremental cost above the next least expensive option and their incremental benefit above the next least expensive option.

The methodology described above has been implemented in a Microsoft Excel (version 2003) spreadsheet with embedded computer programming. It can be run on any computer with Excel. A detailed user guide to this spreadsheet is provided in Section 2 in the body of this report, and the spreadsheet is applied to four Florida case studies in Section 8.

As concluded in Phase 2 report, there is not sufficient data for the four Florida case studies to compare the output of the *ex ante* model to historical realized benefits. There is not even enough data to determine upper and lower bounds of potential results. Analyzing the cases studies with the model is done to provide insights into how different variables affect costs and benefits of undergrounding; the purpose is not to replicate actual realized benefits or to anticipate future benefits.

It must be understood that the methodology requires the user to input many parameters and many assumptions. For many of these parameters and assumptions, there is little basis in historical data and expert judgment must be used. It is beyond the scope of this project to recommend parameters and assumptions. The spreadsheet should be viewed as a "calculator" and it is the responsibility of the user to make appropriate decisions about input parameters and assumptions.

> The methodology and corresponding tool described in this report should be viewed as a "calculator." It is the responsibility of the user to make appropriate decisions about input parameters.

Even if utilities do not have a large amount of data from which to base assumptions and parameter selections, much insight can be gained by using the tool. In fact, the tool can be used to determine the sensitivity of results to certain assumptions and certain parameters.

The conversion of overhead electric power distribution facilities to underground has been a topic of discussion in Florida for more than twenty years. The topic has been studied, discussed, and debated many times at the state, municipal, and local levels. Overhead construction is generally the standard for new construction, with developers or customers typically paying for any incremental cost for underground construction. However, all investor-owned utilities are required to have a process where customers can opt to underground existing overhead service by paying the incremental cost. For municipals and cooperatives, the decision to underground is left to local citizen boards.

It is well-known that the conversion of overhead electric distribution systems to underground is costly, and these costs almost always exceed quantifiable benefits. This conclusion is reached consistently in many reports that range from state-wide studies to very small projects. However, there is no consistent approach has been used to compute the costs and benefits of proposed undergrounding projects, making studies difficult to interpret and use for making decisions.

As more areas in Florida begin to explore the possibility of underground conversion, it becomes increasingly desirable to have a consistent methodology to assess the associated costs and benefits. Results from a trusted approach can provide insight, lead to better projects, aid in customers communicating with utilities, and potentially help guide certain regulatory approaches.

This report has presented a methodology capable of computing the costs and benefits of potential undergrounding projects. The methodology can also be used to compute the costs and benefits of other activi-

ties that have an impact on hurricane performance such as the hardening of overhead systems. The methodology used a detailed simulation with the following components: hurricane module, equipment damage module, restoration module, and cost-benefit module. This methodology has been implemented in a spreadsheet application so that it can be easily used by interested parties.

The conversion of overhead electric infrastructure to underground is of interest around the country and around the world. Often times underground conversion proposals are either pursued or rejected without a systematic analysis of costs and benefits. The methodology presented in this report is an attempt to add consistency, rigor, and thoroughness to these types of analyses. At present, the methodology is specific to the state of Florida, but the general approach is valid wherever extreme weather events have the potential to wreck havoc on electricity infrastructure.

PURC's Hardening Research

Jamison,Mark A [mark.jamison@warrington.ufl.edu]

Sent: Tuesday, November 13, 2012 1:20 PM

To: Michael Karukin

Cc: Kury,Ted [ted.kury@warrington.ufl.edu]; Melissa L. Stevens Pickle [melissa.stevens@warrington.ufl.edu]

Thank you for contacting PURC about our storm hardening research. The research is summarized in reports found at http://warrington.ufl.edu/centers/purc/research/energy.asp under the heading "Research in Electricity Infrastructure Hardening".

As you can see in our reports, such as our initial report at http://warrington.ufl.edu/centers/purc/docs/report_PURC_Collaborative_Research_2007.pdf, this research was conducted at the direction of the Florida Public Service Commission (Florida Public Service Commission Order No. PSC-06-00351-PAA-EI issued April 25, 2006) to analyze ways that Florida could better prepare its electric infrastructure for severe storms, such as hurricanes. All of the work was done with the oversight of a steering committee and reviewed by the staff of the Florida Public Service Commission. PURC provided an annual report to the sponsors, who then provided it to the Florida Public Service Commission as part of their annual reports to the Commission on storm hardening. PURC was present on several occasions at public meetings of the Commission to describe the research and answer questions.

As should always be the case with academic research, the methods that PURC used for this research are available for all to view and critique. We would be happy to discuss the research with anyone who has an interest.

Best,

dr.j.

Mark A. Jamison, Ph.D., Director
Public Utility Research Center http://www.purc.ufl.edu
Warrington College of Business Administration
205 Matherly, PO Box 117142
University of Florida
Gainesville, FL USA 32611
+1.352.392.6148 mark.jamison@warrington.ufl.edu
vCard

"Leadership in Infrastructure Policy"

"Where there is no vision, the people perish." Solomon

Cost-Effectiveness of Undergrounding Power Lines

Presented by
Kevin J. Mara, P.E.

HiLINE ENGINEERING
a GDS Company

Introduction

- Hi-Line Engineering is a consulting firm specializing in the design distribution systems
- We design 300 miles of line each year
- Teach over 30 training classes on proper design of overhead and underground distribution lines
- Provide expert testimony regarding public contact with distribution lines
- General consulting for planning the expansion of power systems

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Training for North American Wood Pole Council

- Wood Pole Structure Design Seminar
  - Nashville April 3-5
  - Nashville Sept 25-27
- Focus on distribution line design
  - Conductor characteristics
  - Pole strengths
    - Calculation of wind loading
  - Pole-Top assemblies
  - Guying and Anchoring
    - Calculation of loading

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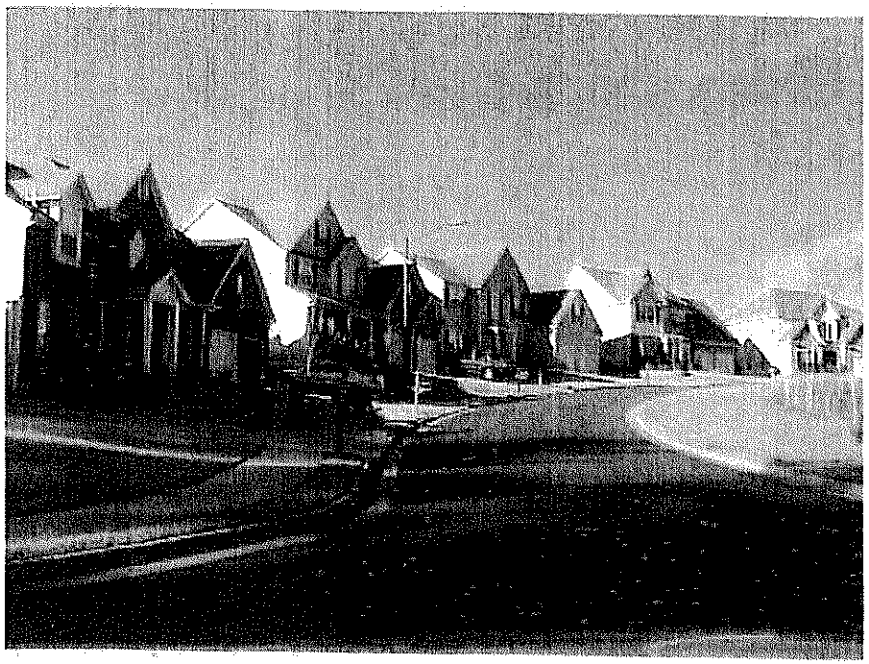
Desire for Underground Utilities



- The Public wants underground utilities
  - Desire the college campus look
- Most new subdivisions are fed underground
  - Reported 9 out 10
  - Many comminutes require underground utilities before approving subdivision
  - Developers want underground utilities and even advertise underground utilities.

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Commercial Developments

- Developer's desire underground service
  - Aesthetics
- Utility's also like underground to commercial developments
  - Less expensive
  - Padmounts verse two-pole platform mounted
  - Vehicle damage is reduced
  - Clearance limitations

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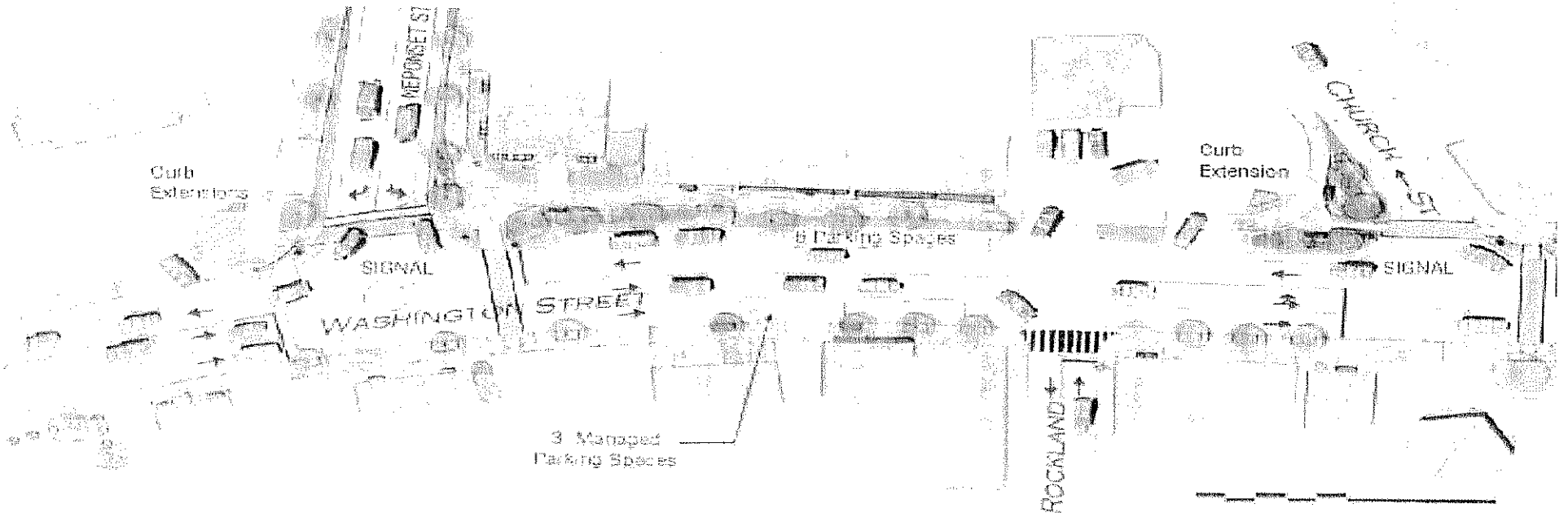
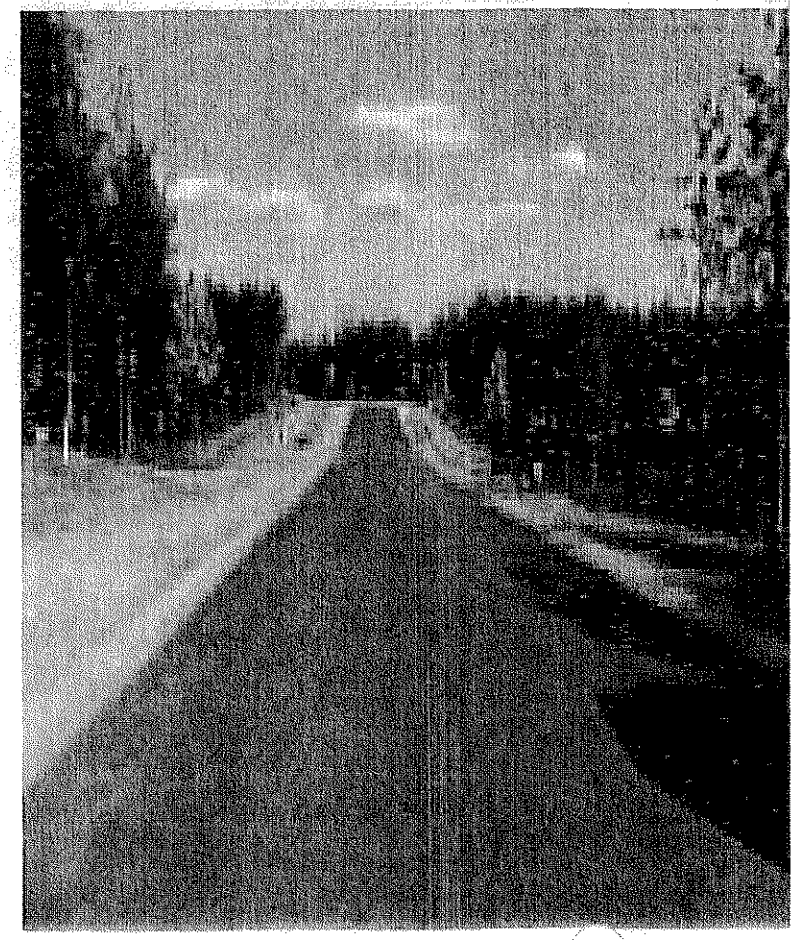
Undergrounding Trends

- One Alabama Cooperative Experience
  - 55% of new services are underground in 2000
  - 75% of new services are underground in 2006
- Streetscape projects
  - Urban beautification
- Comprehensive Plan for Undergrounding
  - San Antonio, Tx
  - Colorado Springs, Co
  - Williamsburg, Va
  - Tocoma, Wa



Desire for Underground

- Communities want underground
- Willingness to pay for underground
  - Cost in Aide
  - 0-$1000s/lot
- Selling point for new homes
- Can it be justified?
  - Not affected by storms
  - No right-of-way maintenance
  - Considered safer



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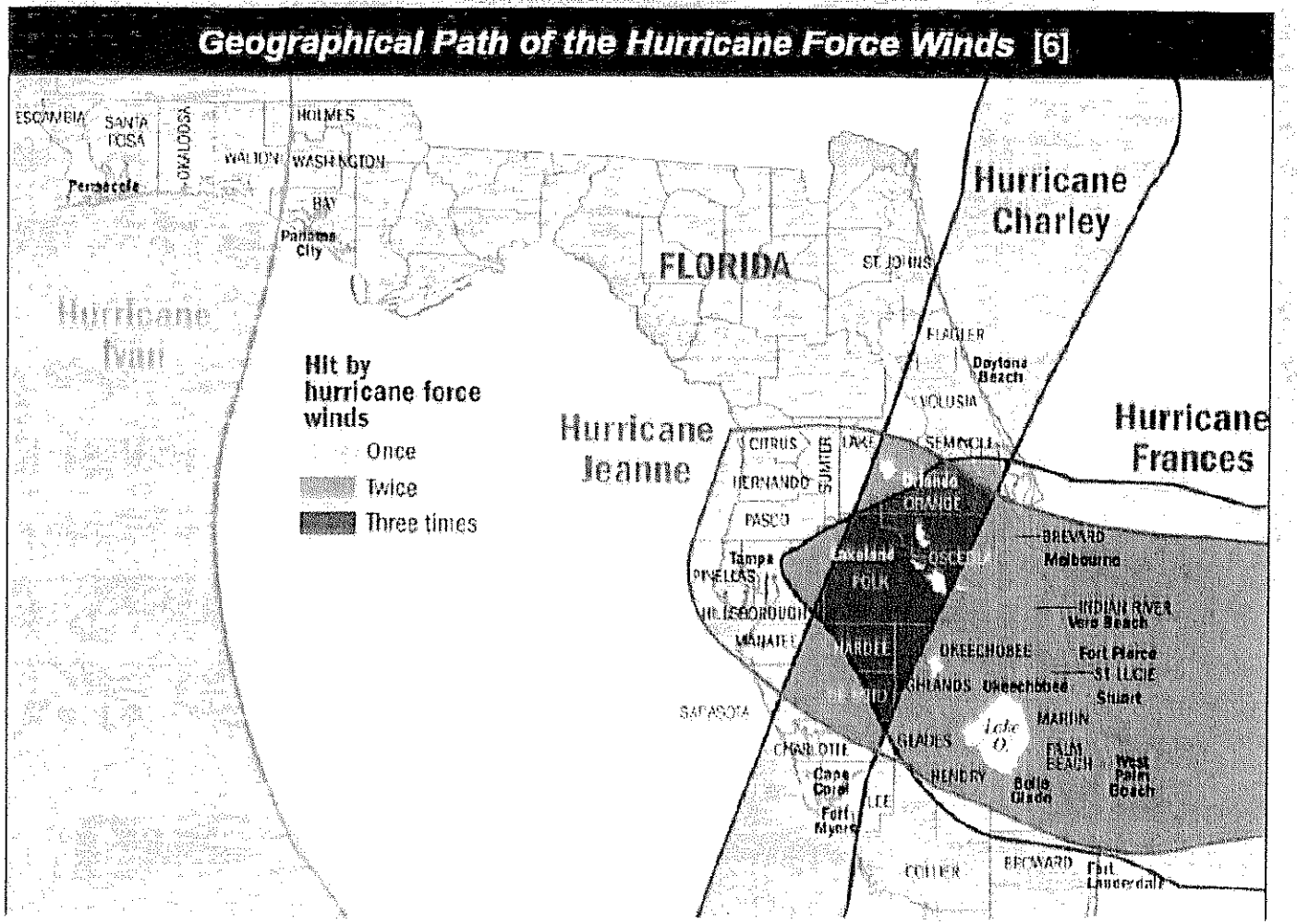
After severe storms, the public/governmental agencies want to replace overhead line with underground lines

Recent Studies

- Florida
- Virginia
- North Carolina
- Maryland



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Cost Effectiveness of Undergrounding

Cost per Mile of Overhead Systems

- $15,000 for 1-phase
- $80,000 for 3-phase
- $250,000 for extra large 3-ph

- Service $1,500 to $2,500
- 25 kVA Transformer $1,000

Cost per Mile of Underground Systems

- $25,000 for 1-phase
- $160,000 for 3-phase
- $1,500,000 for extra large 3-ph

- Service $2,000 to $5,000
- 25kVA Padmount Transformer $2,000

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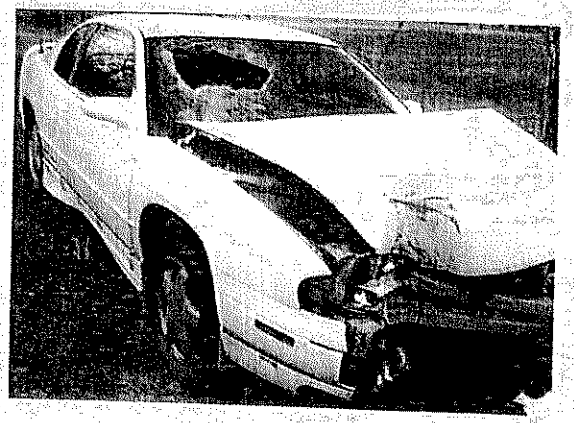
Cost Effectiveness of Undergrounding

- High initial cost of underground offset by
  - Reduction in tree trimming costs
    - (largest cost outside of power costs)
  - Reduction in vehicle accidents
    - (17% of highway deaths involve poles)
  - Reduction restoration costs
  - Reduction in line losses
    - Larger conductors



- All the states that have recently studied and analyzed the cost compared to the savings have the same conclusion
  - Undergrounding CAN NOT be justified based on economics

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Virginia 2005 Study

Economic Benefit	Annualized Benefits	Annualized Cost
Underground Power Lines		$10,000,000,000
O&M Savings	Negligible	
Tree trimming savings	$50,000,000	
"100-Yr" Post Storm rebuild	$40,000,000	
Avoided Sales Lost	$14,000,000	
Avoided Vehicle Accidents	$150,000,000	
Avoided Outages	$3,670,000,000	
Total	**$3,924,000,000**	**$10,000,000,000**

Cost is based on initial investment of $93,900,000,000

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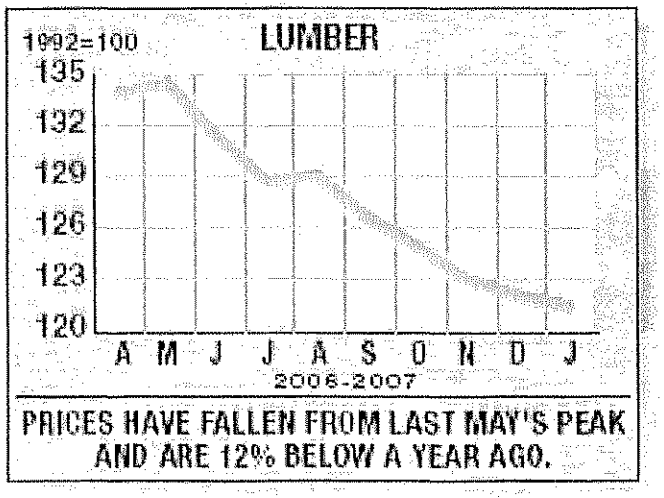
Service Life and Reliability

- Service Life
  - Overhead lines 30-50 years
    - 30 years for poles, 50 years for conductor
  - Underground lines 30 years
    - 30 years for cable, could be less for padmounted equipment
- Reliability
  - Underground reliability fades after 25 years
  - Fewer outages but longer outages
    - North Carolina study reported
      - 92 minutes for overhead outages
      - 145 minutes for underground outages

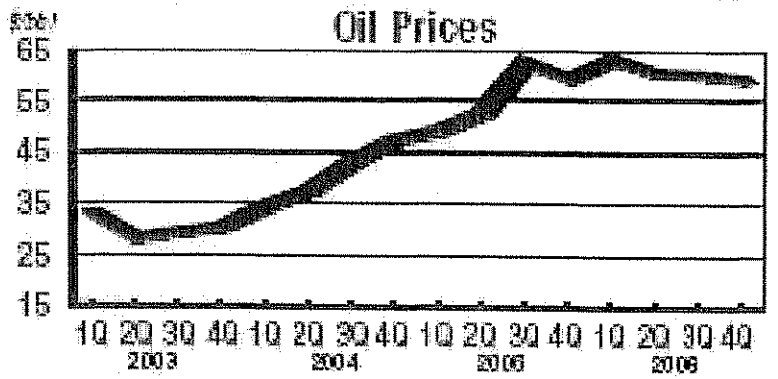
Trending Differences Costs

- Labor is about the same
- Overhead material costs will track wood pole prices
- Underground material costs track oil and metal prices
  - Conduit and cable insulation, padmounted cabinets

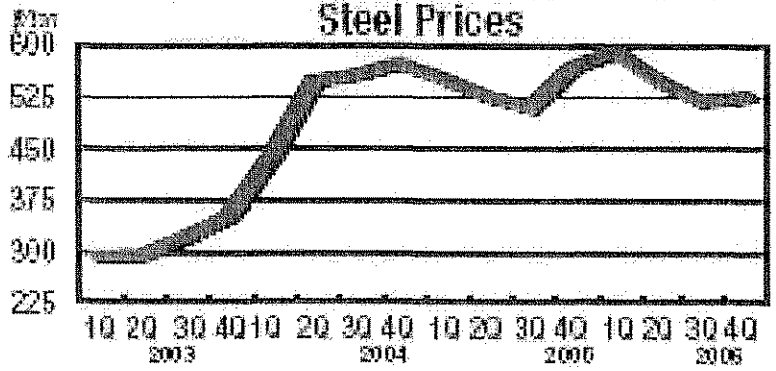


PRICES HAVE FALLEN FROM LAST MAY'S PEAK AND ARE 12% BELOW A YEAR AGO.

High oil prices are expected to remain near $60 per barrel throughout 2006.



SOURCE: GLOBAL INSIGHTS, AVERAGE PRICE OF WEST TEXAS INTERMEDIATE CRUDE. 2006 FIRST-QUARTER ESTIMATE AND FORECAST



SOURCE: GLOBAL INSIGHTS

Structural steel prices are holding near peak levels set in 2004.

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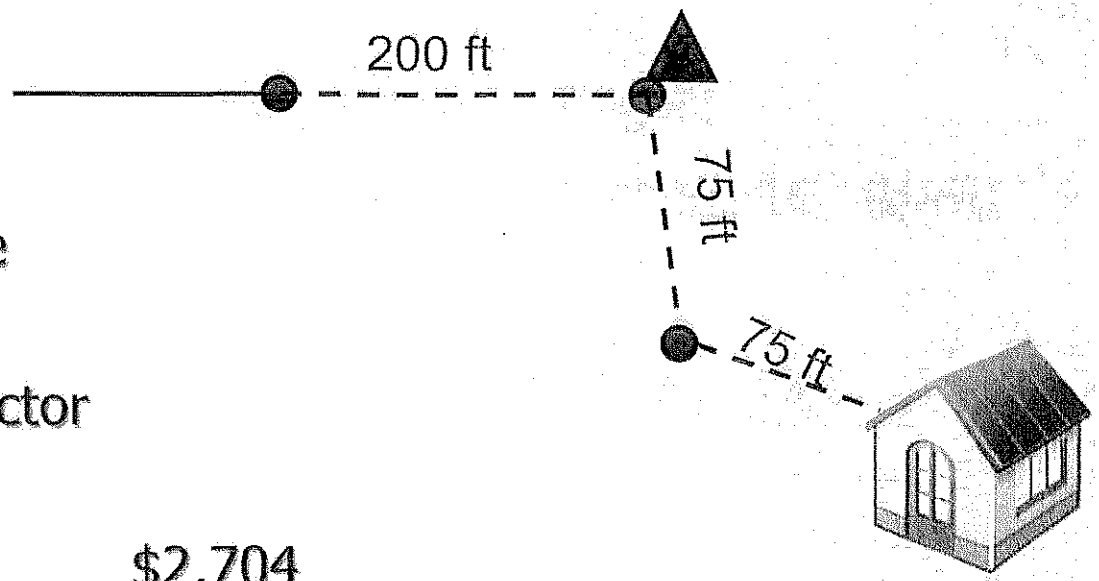
Case Study

- Single family home
  - 2,400 square feet
- 200 feet of 7,200 volt line
- Transformer
- 150 feet of service conductor



Overhead	$2,704
Underground	$4,763
Hybrid	$3,325
Overhead 7200 volt	
Underground Service	
(cost of conduit & trench = $706)	

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Undergrouding the Last Span

- The service drop to the house is vulnerable outages
  - Falling trees
  - Trees not trimming as aggressively on service drops
- When a tree falls on service drop
  - Pulls the weather head off the house
  - The weather head is owned by the customer
    - He/She must make repairs before restoration of power
- Undergrounding the last span will reduce outage times
  - Encouraged by some communities and utilities

Conclusions

- Underground power is not cost-effective
  - According to four state commissions
- Studies shows benefits
  - Reduced tree trimming
  - Reduced restoration cost from severe storms
  - Not enough benefits to justify cost
- Public believes there is a value
  - Willing to pay for additional costs
  - Reason is aesthetics
  - As long undergrounding costs remains a small percentage of the home cost
    - Home buyers will continue to demand underground

InfraSource

Undergrounding Assessment Phase 1 Final Report:

Literature Review and Analysis of Electric Distribution Overhead to Underground Conversion

Prepared for: Florida Electric Utilities

Prepared by: InfraSource Technology

Contact: Richard Brown, PhD, PE
richard.brown@infrasourceinc.com
4020 Westchase Blvd., Suite 375
Raleigh, NC 27607
919-961-1019 (V)
610-757-1705 (F)

February 28th 2007

Executive Summary

The conversion of overhead electric power distribution facilities to underground has been a topic of discussion in Florida for more than twenty years. The topic has been studied, discussed, and debated many times at the state, municipal, and local levels. Overhead construction is the standard in Florida, but all investor-owned utilities are required to have a process where customers can opt to underground existing overhead service by paying the incremental cost. For municipals and cooperatives, the decision to underground is left to local citizen boards.

This report presents the results of a review of relevant previous undergrounding studies done in Florida as well as literature on the subject from throughout the US and around the world. This review finds that the conversion of overhead electric distribution systems to underground is costly, and these costs are far in excess of the quantifiable benefits presented in existing studies, except in rare cases where the facilities provide particularly high reliability gains or otherwise have a higher than average impact on community goals.

This conclusion is reached consistently in many reports, which almost universally compare the initial cost of undergrounding to the expected quantifiable benefits. No prior cost benefit study recommends broad-based undergrounding, but several recommend targeted undergrounding to achieve specific community goals.

All numbers quoted throughout this report appear in one or more of the reports cited.[1]

Undergrounding is Expensive

As a rough estimate, the cost of converting existing overhead electric distribution lines and equipments to underground is expected to average about $1 million per mile. In addition there are costs required to convert individual home and business owner electric service and meter facilities so they will be compatible with the new underground system now providing them with electricity. Further, there are separate, additional costs associated with site restoration and placing third-party attachments underground.

When only considering the direct utility cost of a conversion from overhead to underground, studies find that undergrounding distribution facilities in residential neighborhoods served by investor-owned utilities in Florida would cost an average of about $2,500 per residential customer affected. Undergrounding residential main-trunk feeders (those lines leading to residential neighborhoods) throughout Florida would cost an average of about $11,000 per residential customer affected. Undergrounding all main trunk commercial feeders (those feeding business and office areas, etc.) in Florida would cost an average of about $37,000 per commercial customer affected.

Costs in any particular situation could vary widely from these estimates depending upon electric system design, construction standards, customer density, local terrain, construction access issues, building type, and service type. Existing studies estimate the wholesale conversion of overhead electric distribution system to underground would require that electricity rates increase to approximately double their current level, or possibly more in areas with a particularly low customer density.

[1] References are intentionally left out of this Executive Summary. They are included throughout the main body of the report.

Further Costs Must Be Incurred to Obtain Complete Aesthetic Benefits

Nearly every study and examination of overhead to underground conversion notes in some manner that removing the poles, overhead lines and equipment, and in some cases above-ground facilities required for the overhead utilities will improve the visual appeal – the aesthetics – of an area, be it residential or commercial property. Opinions and analytical studies of the value of this aesthetic improvement differ widely as to results, but no studies examined in this report conclude that aesthetics had a *quantifiable* monetary benefit that substantially affected the overall benefit-to-cost ratio for the conversion.

Regardless, there is no doubt that some municipal governments, developers, businesses, and homeowners value the aesthetic improvement brought about by undergrounding of utilities very highly. This is evident because some choose pay the cost differential for underground service themselves (for new construction).

The electric system conversion costs discussed above would *not* always provide aesthetic improvement without additional expenses to convert third-party utilities such as telephone and cable television to underground. The costs necessary to relocate all remaining utilities underground is most often estimated at somewhere between 10% and 30% beyond the cost of the electric conversion.

Undergrounding Provides a Number of Benefits

In return for the considerable expense, electric customers can receive a number of potential benefits from the undergrounding of their overhead systems. The following is a list of benefits most often mentioned in undergrounding reports and studies:

Potential Benefits of Underground Electric Facilities

- Improved aesthetics;
- Lower tree trimming cost;
- Lower storm damage and restoration cost;
- Fewer motor vehicle accidents;
- Reduced live-wire contact;
- Fewer outages during normal weather;
- Far fewer momentary interruptions;
- Improved utility relations regarding tree trimming;
- Fewer structures impacting sidewalks.

Undergrounding Has a Number of Potential Disadvantages

There are a number of potential disadvantages which need to be considered whenever the conversion of overhead facilities to underground is evaluated. The following is a list of potential disadvantages most often mentioned in undergrounding reports and studies:

Potential Disadvantages of Underground Electric Facilities

- Stranded asset cost for existing overhead facilities;
- Environmental damage including soil erosion, and disruption of ecologically-sensitive habitat;
- Utility employee work hazards during vault and manhole inspections;
- Increased exposure to dig-ins;
- Longer duration interruptions and more customers impacted per outage;
- Susceptibility to flooding, storm surges, and damage during post-storm cleanup;
- Reduced flexibility for both operations and system expansion;
- Reduced life expectancy
- Higher maintenance and operating costs;
- Higher cost for new data bandwidth.

Financing Options

The reports and references reviewed in this report all conclude that undergrounding incurs a very substantial additional cost compared to that for overhead distribution, even as they differed on what that cost was and how much of it was justified based on the benefits obtained. Ultimately, those undergrounding costs must be paid if the conversion is to be done. There are many funding options to cover these costs, and selecting the most appropriate financing approach is a critical part of the overall undergrounding process. The following are methods of financing that are most often cited in reports and studies (combinations of these options can be used as well):

Basic Financing Options

- Customer funded;
- Higher electricity rates;
- Higher taxes;
- Special tax districts;
- Utility set-asides;
- Federal funding;
- Private sector funded.

Overall Conclusion

The Florida Public Service Commission as well as many municipalities and electric customers in Florida are interested in undergrounding electric distribution systems in order to improve aesthetics, improve reliability of service, and reduce vulnerability to hurricane damage. The benefits associated with improved aesthetics are not quantifiable. Without considering aesthetics, no study reviewed in this report concludes that wholesale conversion of overhead electric distribution lines to underground can be fully cost justified.

In summary, a review of the body of public knowledge on the undergrounding of electric distribution facilities reveals the following:

Summary of Literature Review on Electric Distribution Underground Conversion

- No state is requiring extensive undergrounding of existing distribution facilities;
- Conversion of overhead facilities to underground is rarely 100% justified on the basis of costs and quantifiable benefits;
- *Ex post* analyses on actual underground conversion projects have not been done;
- Few studies address the potential negative impacts of undergrounding;
- Few studies consider strengthening existing overhead systems as a potential cost-effective alternative to underground conversion;
- There are almost no academic or industry publications that address storm reliability modeling of electric distribution systems;
- Until last year, there was no academic or industry literature that addressed failure rates during hurricanes as a function of hurricane strength;
- Existing research on mitigating the impacts of major storms on electric distribution systems is not sufficient for use in a detailed study.

InfraSource

Final Report

Undergrounding Assessment Phase 2 Report: Undergrounding Case Studies

Prepared for: Florida Electric Utilities

Prepared by: InfraSource Technology

Contact: Richard Brown, PhD, PE
richard.brown@infrasourceinc.com
4020 Westchase Blvd., Suite 375
Raleigh, NC 27607
919-961-1019 (V)
610-757-1705 (F)

August 6th 2007

Executive Summary

This report presents the results of Phase 2 of a three phase project to investigate the implications of converting overhead electric distribution systems in Florida to underground (referred to as undergrounding). The purpose of Phase 2 is to examine the costs and benefits of actual undergrounding projects that have been completed. The focus is to identify the drivers of each project; discuss the challenges of each project; and to collect data that can serve as a real-world basis for the *ex ante* modeling in Phase 3. A summary of the four case studies examined in Phase 2 is shown in Table A.

Table A. Summary of Case Studies

Project	Utility	Year of Conversion	Circuit Miles of Converted Overhead	Circuit Miles of New Underground
Pensacola Beach	Gulf Power	2006	2.6	6.8
Sand Key	Progress Energy Florida	1996	1.8	1.7
Allison Island	Florida Power & Light	2000	0.5	1.0
County Road 30A	Chelco	2006	0.8	0.8

A review of the case studies reaches the same conclusion reached in the Phase 1 literature review: the initial cost to convert overhead distribution to underground is high, and there is insufficient data to show that this high initial cost is 100% justifiable by quantifiable benefits such as reduced O&M cost savings and reduced hurricane damage. Increased data collection can potentially increase the amount of quantifiable benefits, but it is unlikely that these benefits will 100% justify high initial cost, except potentially in a situation where an undergrounded system is struck by multiple severe hurricanes. For all of these case studies, by far the strongest reason for undergrounding is to improve the aesthetics of the area. Additional observations relating to these case studies include:

- All case studies occurred in coastal areas.
- Two of the four projects were done in conjunction with roadway widening projects.
- More circuit miles of underground are sometimes built than the original overhead amount. This is typically to create an underground loop that increases operational flexibility and the ability to respond to faults.
- Cost per circuit mile figures corresponds to those identified in the Phase 1 literature search.
- Cost per customer varies widely based on both the cost per circuit mile and the amount of high density housing such as high rise condominiums.

Not much data is available on the impact of the case studies on non-storm reliability and hurricane performance. The little data that is available indicates that non-storm reliability is not significantly different after undergrounding, and that hurricane reliability of underground systems is not perfect due to storm surge damage.

For these case studies, there is an extensive amount of project description and project cost data, but limited avoided cost and benefit data. These case studies can certainly be used as an input for an *ex ante* model, but there is not sufficient data to compare the output of the *ex ante* model to historical realized benefits. There is not even enough data to determine upper and lower bounds of potential results. At this point, any *ex ante* model that is developed, such as the one to be developed in Phase 3, must be justified by its model assumptions rather than by its ability to replicate realized benefits from any of these case studies.

Final Report

Undergrounding Assessment Phase 3 Report: *Ex Ante* Cost and Benefit Modeling

Prepared for: Florida Electric Utilities

Prepared by: Quanta Technology

Contact: Le Xu, PhD
lxu@quanta-technology.com

Richard Brown, PhD, PE
rbrown@quanta-technology.com
4020 Westchase Blvd., Suite 300
Raleigh, NC 27607
919-334-3021 (Office)
610-757-1705 (Fax)

May 21st 2008

Executive Summary

This report is the Phase 3 deliverable of a project awarded in response to RFP #U-1 issued by the Florida Electric Utilities. RFP #U-1 was a result of Florida Public Service Commission Order No. PSC-06-0351-PAA-EI, which directs each investor-owned electric utility in Florida to establish a plan that increases collaborative research to further the development of storm-resilient electric utility infrastructure and technologies that reduce storm restoration costs and interruptions to customers. Municipal electric and cooperative electric utilities are participating voluntarily.

The scope of the overall project (all three phases) is to investigate the implications of converting overhead electric distribution systems in Florida to underground (referred to as undergrounding). The primary focus of the project is the impact of undergrounding on the performance of the electric infrastructure during hurricanes, which is the ability of the local power system to withstand high winds, storm surges, and other damage from hurricanes and to minimize the number and duration of customer interruptions. This study also considers benefits and issues with regards to performance during non-storm situations.

The project is divided into three phases. Phase 1 is a meta-analysis of existing research, reports, methodologies, and case studies. The Phase 1 final report, *Undergrounding Assessment Phase 1 Final Report: Literature Review and Analysis of Electric Distribution Overhead to Underground Conversion*, was issued on February 28th 2007. Phase 2 examines specific undergrounding project case studies in Florida. The Phase 2 final report, *Undergrounding Assessment Phase 2 Final Report: Undergrounding Case Studies*, was issued on August 6th 2007.

Phase 3 develops and tests a methodology for analyzing the costs and benefits of specific undergrounding proposals in Florida. The methodology is separated into two basic components: normal weather assessment and hurricane assessment. The normal weather model includes the basic cost of utility capital and operational cost information. It also includes high-level reliability information that allows for the calculation of customer interruption information and related costs. A flowchart of the methodology is shown in Figure A-1.

The hurricane model determines infrastructure damage and related costs associated with tropical storms of hurricane strength when making landfall in Florida. To perform a cost and benefit analysis of sufficient detail to meet the objectives of this project, it is necessary to simulate hurricanes moving across Florida. Therefore, a large component of the hurricane model is dedicated to simulating hurricane years. For each year of simulation, the number of landfall hurricanes is randomly determined based on historical hurricane data. For each hurricane (if any), the landfall location, direction, speed, strength, and other parameters are also randomly determined based on historical hurricane data.

When a hurricane makes landfall, a storm surge model determines the amount of infrastructure damage that occurs in susceptible areas due to the wall of water (i.e., storm surge) that the hurricane pushes onto coastal areas.

As the hurricane travels over land, the simulation model keeps track of the fastest wind gusts to which each location is exposed. This determines the amount of wind damage that occurs during the hurricane. The model is flexible enough to consider many types of construction with many types of wind loading characteristics. This includes standard construction (e.g., Grade B, Grade C), "hardened" systems, and others.

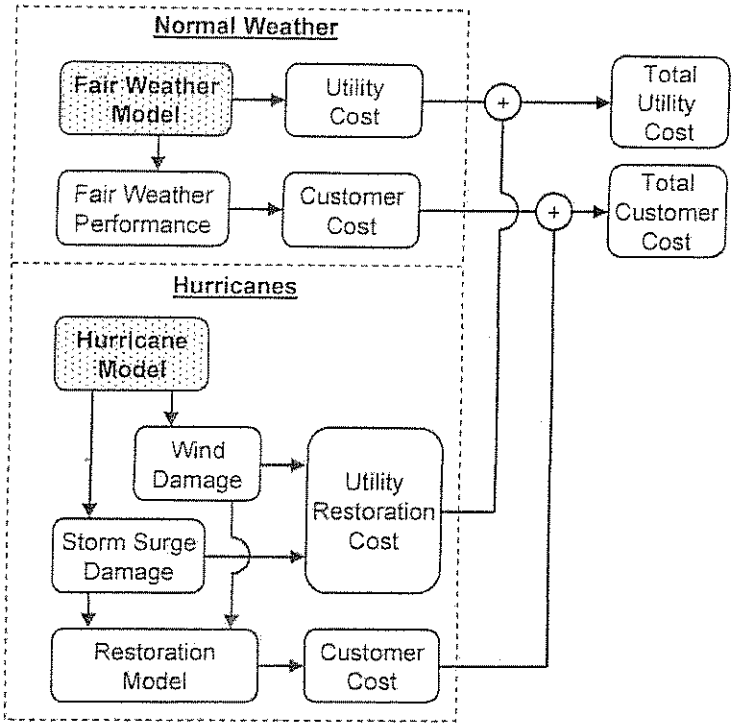

Figure A-1. Overview of Methodology

For each simulated hurricane, the model determines the amount of damage both for the proposed project area and for the entire service territory of the associated utility. Damage for the entire service territory is needed to determine the total utility restoration time, which then determines the restoration time for the proposed project area.

Once the total hurricane damage is determined for the entire project area, a restoration model is used to determine when repairs on the proposed project area begin and end. This restoration model includes factors such as startup inefficiencies (e.g., due to debris on roads), crew ramp up, and the difference between overhead crews and underground crews.

The hurricane damage and restoration models provide information that allows for the calculation of utility restoration costs, customer interruptions, and the customer costs associated with the interruptions. Taken together, the utility and customer costs constitute the total costs of the hurricane as it relates to electric utility infrastructure.

After simulating the costs and benefits of all hurricanes in a specific hurricane year, additional hurricane years can be simulated. Many simulated years will have no hurricanes and will therefore have no hurricane costs. Some simulated years will have a single weak hurricane and will therefore have small hurricane costs. Some simulated years will have multiple major hurricanes and will therefore have significant hurricane costs. Simulating many hurricane years allows the average hurricane cost to be computed.

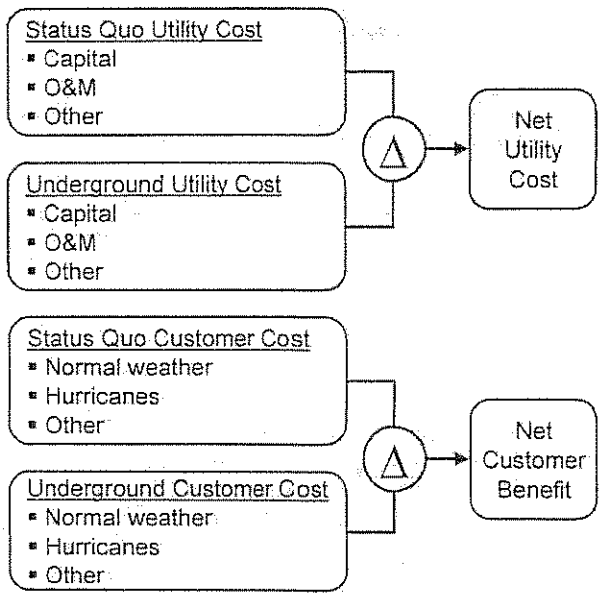

Figure A-2. Approach to Cost and Benefit Calculations

The output of the simulation is a list of initial utility costs, annual utility costs, customer interruption minutes during normal weather, and customer interruption minutes during hurricanes. The model is flexible enough to accommodate any cost category that can be characterized by initial cost and/or a recurring annual cost.

The model is designed to compare two cases. Typically, this will be the "status quo" case and a proposed undergrounding option. Hurricane simulations are performed automatically for both cases so that costs and reliability differences can be compared. This approach is shown in Figure A-2.

Consider a situation where a utility is considering an undergrounding project. When assessing this project, the utility will first enter information about the existing system. This allows the current utility costs, reliability performance, and customer costs to be calculated. The utility also enters information about the undergrounding project including the initial cost, annual costs, annual savings, and so forth. The assessment is then able to simulate the performance of the undergrounded system and compute associated utility costs, reliability performance, and customer costs. The difference in utility cost between the status quo and the proposed scenario is defined as the net utility cost. The difference in reliability performance is defined as net reliability benefit. When reliability benefit is translated into customer cost, it is defined as net customer cost. Net reliability benefit and net customer cost, taken together, constitute net customer benefit.

The scenario comparison in Figure A-2 is flexible and does not necessarily have to be used to compare the status quo to a proposed underground project. For example it could be used to compare the status quo to a proposed "hardened overhead" project where existing overhead structures are reinforced to better withstand wind damage. It could also be used to compare a proposed undergrounding project to a proposed hardened overhead project. Generally, the framework is suitable to compare any given "Scenario A" with another given "Scenario B." This allows a range of options to be explored and compared based

on their incremental cost above the next least expensive option and their incremental benefit above the next least expensive option.

The methodology described above has been implemented in a Microsoft Excel (version 2003) spreadsheet with embedded computer programming. It can be run on any computer with Excel. A detailed user guide to this spreadsheet is provided in Section 2 in the body of this report, and the spreadsheet is applied to four Florida case studies in Section 8.

As concluded in Phase 2 report, there is not sufficient data for the four Florida case studies to compare the output of the *ex ante* model to historical realized benefits. There is not even enough data to determine upper and lower bounds of potential results. Analyzing the cases studies with the model is done to provide insights into how different variables affect costs and benefits of undergrounding; the purpose is not to replicate actual realized benefits or to anticipate future benefits.

It must be understood that the methodology requires the user to input many parameters and many assumptions. For many of these parameters and assumptions, there is little basis in historical data and expert judgment must be used. It is beyond the scope of this project to recommend parameters and assumptions. The spreadsheet should be viewed as a "calculator" and it is the responsibility of the user to make appropriate decisions about input parameters and assumptions.

> The methodology and corresponding tool described in this report should be viewed as a "calculator." It is the responsibility of the user to make appropriate decisions about input parameters.

Even if utilities do not have a large amount of data from which to base assumptions and parameter selections, much insight can be gained by using the tool. In fact, the tool can be used to determine the sensitivity of results to certain assumptions and certain parameters.

The conversion of overhead electric power distribution facilities to underground has been a topic of discussion in Florida for more than twenty years. The topic has been studied, discussed, and debated many times at the state, municipal, and local levels. Overhead construction is generally the standard for new construction, with developers or customers typically paying for any incremental cost for underground construction. However, all investor-owned utilities are required to have a process where customers can opt to underground existing overhead service by paying the incremental cost. For municipals and cooperatives, the decision to underground is left to local citizen boards.

It is well-known that the conversion of overhead electric distribution systems to underground is costly, and these costs almost always exceed quantifiable benefits. This conclusion is reached consistently in many reports that range from state-wide studies to very small projects. However, there is no consistent approach has been used to compute the costs and benefits of proposed undergrounding projects, making studies difficult to interpret and use for making decisions.

As more areas in Florida begin to explore the possibility of underground conversion, it becomes increasingly desirable to have a consistent methodology to assess the associated costs and benefits. Results from a trusted approach can provide insight, lead to better projects, aid in customers communicating with utilities, and potentially help guide certain regulatory approaches.

This report has presented a methodology capable of computing the costs and benefits of potential undergrounding projects. The methodology can also be used to compute the costs and benefits of other activi-

ties that have an impact on hurricane performance such as the hardening of overhead systems. The methodology used a detailed simulation with the following components: hurricane module, equipment damage module, restoration module, and cost-benefit module. This methodology has been implemented in a spreadsheet application so that it can be easily used by interested parties.

The conversion of overhead electric infrastructure to underground is of interest around the country and around the world. Often times underground conversion proposals are either pursued or rejected without a systematic analysis of costs and benefits. The methodology presented in this report is an attempt to add consistency, rigor, and thoroughness to these types of analyses. At present, the methodology is specific to the state of Florida, but the general approach is valid wherever extreme weather events have the potential to wreck havoc on electricity infrastructure.

Attachment "3D"

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8 comments

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Thad Moyseowicz ·

I lived in a major northern European city as an expat from 2003-09, a city located at about the same latitude as Winnipeg and which buries its power cables, a city in an area with a very high water table (ever see the pictures of the waterlogged WWI Flanders Fields trenches?). I've come back to my country which during my teenage years landed men on the moon, and for a bit over a year have been in my nice upscale neighborhood in the greater DC area which adheres to the practice of hanging power cables off of creosoted pine poles, no doubt because it's a tried and true technology. Twice in the past 7 months I've suffered power outages in excess of 12 hours each [the first from a winter snowstorm, the most recent from Irene]. I never suffered a power outage in Europe (but I lost a major tree to a storm). Mr. Kury is absolutely correct that it would cost to transition to the more intelligent practice I'll even stipulate to his estimate. But he's on shaky ground when he invokes heat dissipation as a problem (the engineers in the country I lived in somehow managed to lick that). It is disheartening to return to a country whose infrastructure was once the world's envy but is now Third World.

· Share ›

Michael Ossar ·

You forgot to ask Mr. Kury why we can't revise building codes to require that all *new* housing developments have buried power lines. Presumably the costs to bury power lines along with cable, sewer and other services in a new development would be much less that that of retrofitting existing communities. Somehow I don't remember seeing lots of utility poles in Paris, London, Berlin or any other European city. How come Slovenia can afford this sensible idea but the USA cannot?

· Share ›

Ted Kury ·

I apologize if it wasn't clear, but the issue of heat dissipation is not a matter of technical feasibility. We bury power lines all of the time. We know how to do it. It is a matter of expense, however, as you're not just talking about burying an extension cord in the dirt.

· Share ›

Ted Kury ·

I think that the intereest in the subject is great, but it's pretty unrealistic to think that you can cover it all in a ten minute interview, especially when it's edited down to four minutes. Overall, I think that the NPR staff did a great job condensing the interview to the major points. @MC: I'd love to know that too, but the data are deemed proprietary. It's a great question and would make a great paper. @Mitch: The success stories of undergrounding are myriad, but I stand by my statement that the question of whether to underground lines depends on a lot of factors. Undergrounding is not a universal best practice. @Martin: I actually said that it takes policymakers (on behalf of customers, generally), regulators, and utilities all working together, and that no one group can accomplish anything unilaterally. That's how we've been able to accomplish everything we've done in Florida. @Michael: It all comes down to what you're willing to pay. Do you know what they pay for electricity in Europe? Twice what we do. That will not fly here.

· Share ›

Emacee 1701 ·

I see some missed points here, as well:

I've seen old pictures of New York with above-ground power lines. It would be interesting to know how/why the decision was made to bury power and other utility lines.

I grew up where powers and utility lines were always above ground. Now, the system seems much more vulnerable to outages, not just in extremely severe weather but power goes out in routine bad weather. I've always suspected that the utilities decided it was cheaper for them to fix things after an outage than to update, upgrade and maintain the system to prevent outages. I'd really love to see NPR find out if (1) outages have become more common and more lengthy and (2) if utilities are practicing deferred maintenance of their infrastructures.

· Share ›

Mitch Dion ·

Advantages of Underground - White paper

http://www.underground2020.org/documents/Advantages%20of%20Undergrounding%20Util 09.pdf

· Share ›

Mitch Dion ·

NPR you let him off without following the money. Mr. Kury, like the investor owned utilities that control distribution and transmission lines seemed to dismiss the real reliablity advantages for buried lines in favor of the industry spin to support their profits. The life cycle costs and the reductions in unquantifiable health impacts from EMR far out weigh the short falls of periodic flooding that generally do not occur in well constructed utility vaults (outside of a flood zone). Here in Fallbrook CA, we prefer them buried - too bad San Diego Electric is not interested in real savings - just profit. NPR follow the money for the

real story.

· Share ›

Martin Lagon ·

Mr. Kury said that the public utility commissions had a large part in this. After Isabel in 2003, I discussed the matter with the Maryland PUC members. I suggested they take steps to require BG&E begin in 5 yrs and beyond to bury a percentage of their old lines per year. That PUC said they were not "empowered" to make such a recommendation. We spend 4 days in the dark, and I know it's happening again. I live in Denver Colorado now and guess what - it's very hard to find lines on poles here, at least in the parts I travel, and outages occur much much less.

· Share ›

Attachment "3E"

Would Burying Power Lines Reduce Power Outages?

August 29, 2011

Hurricane Irene left about 7 million homes and businesses without power. But could that number have been reduced if more power lines were buried? Robert Siegel speaks with Ted Kury, director of energy studies at the University of Florida's Public Utility Research Center, about the advantages and costs of buried power lines.

ROBERT SIEGEL, host: Having grown up in a densely populated area - in fact, in the most densely populated neighborhood of our most densely populated city - I am still a little puzzled by downed power lines. Growing up, I figured that electricity, like water and subway trains, was something that traveled underground, and that meant no unsightly polls and cables running up and down First Avenue in Manhattan, no occasional outage due to a drunk driver crashing his Volvo into a poll and no fear that trees that snapped during snowstorms and hurricanes would fall on power lines and cut off electricity.

So with so many power lines felled by Hurricane Irene, we ask: Why don't we bury more power lines than we do? And we're going to put that question out to Ted Kury, who is director of energy studies at the University of Florida's Public Utility Research Center.

Welcome to the program.

TED KURY: Thank you.

SIEGEL: And I gather the answer is money. How expensive is it?

KURY: Certainly the cost is going to depend on the geography and the density of the region. A rule of thumb that we use down here in Florida is roughly a million dollars per mile.

SIEGEL: A million dollars per mile underground. And, say, above ground?

KURY: Well, that would be roughly the incremental cost.

SIEGEL: The incremental cost. I've heard the ratio 10 to 1 tossed around. That it's ten times more expensive to bury power lines than to run them above ground.

KURY: Ten to one is probably not a bad back in the envelope number.

SIEGEL: So it costs a great deal more to bury cables, but then again you don't routinely lose service in snow storms or hurricanes. Don't the costs of maintaining above ground lines start to add up?

KURY: Well, they do, but you're not really eliminating risk completely when you underground the power lines. You're simply trading off one type of risk for another. Yes, you've mitigated the risk of

losing power because of a failure in the pole or a tree getting blown into the lines. But you've traded that risk off for outages due to storm surge or to flooding.

SIEGEL: But underground aren't there other things already there in many of these same communities, say, you know, television cables underground?

KURY: Certainly. But you still have the expense of digging everything up again. And burying a power line underground, there are certain allowances that you have to make. When electricity flows through a distribution line or a transmission line it generates heat. And out in the air that heat is allowed to dissipate, but underground you have to make other allowances for basically cooling those lines.

SIEGEL: Do you think that the argument in favor of burying lines is in large part an aesthetic one? That only utilities think a utility pole is a thing of beauty?

KURY: Well, I think that people tend to only think about the reliability of the electric system when the power goes out. So most of the time - I would guess - when communities are making the decision to pay for power lines to be underground primarily it's aesthetic, because effectively you don't see the power lines every day if they're buried underground. Where any reliability benefit that may accrue is not even really obvious when there's a storm event.

SIEGEL: From what I'm hearing you say, I wouldn't expect any change here in American practice about whether power lines go underground or above ground.

KURY: Well, the problem is it's very difficult for a utility to unilaterally make that decision. Ultimately, the utility is responsible to the Public Service Commission of that particular state, who will assess whether a utilities expenditure was prudent. So it really does take a collective effort between policymakers and regulators and the utilities themselves to affect any kind of change. It really is an effort where everyone has to work together.

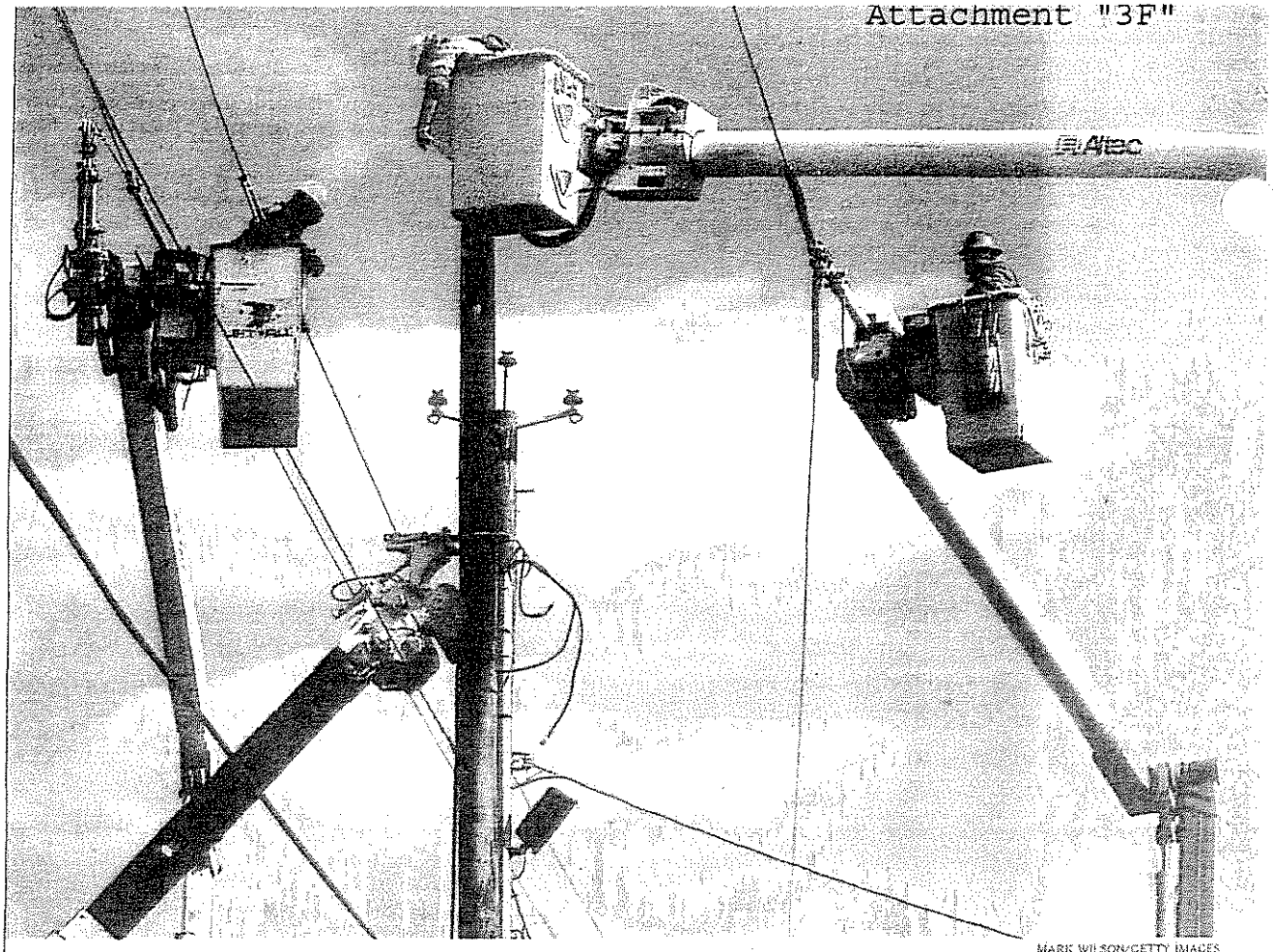
SIEGEL: Well, Ted Kury, thanks for talking with us about lines underground and above ground.

KURY: Thank you very much, Robert.

SIEGEL: Mr. Kury is director of energy studies at the Public Utility Research Center at the University of Florida.

(SOUNDBITE OF MUSIC)

MELISSA BLOCK, host: You are listening to ALL THINGS CONSIDERED.



MARK WILSON/GETTY IMAGES

Utility workers in Seaside Heights, N.J., making pole repairs after the destruction caused by Hurricane Sandy.

Upgrade or Clean Up?

Hurricane Sandy Alters the Cost-Benefit Calculus for Utilities

This article is by Diane Cardwell, Matthew L. Wald and Christopher Drew.

After Hurricane Sandy wreaked havoc with power systems in the Northeast, many consumers and public officials complained that the electric utilities had done far too little to protect their equipment from violent storms, which forecasters have warned could strike with increasing frequency.

But from a utility's perspective, the cold hard math is this: it is typically far cheaper for the company, and its customers, to skip the prevention measures and just clean up the mess afterward.

Consolidated Edison, for example, expects to spend as much as $450 million to repair damages to its electric grid in and around New York City. Since utilities are generally allowed to recover their costs through electric rates, customer bills in the region, which typically run about $90 a month for residential customers, would have to rise by almost 3 percent for three years to cover those expenses alone.

Fully stormproofing the system — sinking power lines, elevating substations and otherwise hardening equipment against damage from torrential winds and widespread flooding — could easily cost 100 times as much. For Con Ed, carrying out just one measure — putting all of its electric lines underground — would cost around $40 billion, the company estimates. To recover those costs, electric rates would probably have to triple for a decade or more, according to Kevin Burke, Con Ed's chief executive.

Avoiding such large investments is also appealing for another reason: the federal government has sometimes helped bail out utilities after catastrophes, like the Sept. 11 terror attacks and Hurricane Katrina. It may do so again this time in response to pleas from the governors of New York and New Jersey.

Still, there are signs that the devastation caused by Hurricane Sandy is upending the traditional cost-benefit calculations.

The Northeast has been hit by three big storms in just over a year, and forecasters say that so-called 100-year storms are likely to occur more frequently.

Utilities and policy makers can see that ocean surge poses a previously unexpected threat to the power grid.

And there is growing recognition that the true cost of disruptions, in terms of gasoline lines, lost workdays and busi-

Continued on Page 6

Hurricane Alters Financial Calculus For Utilities

From First Business Page

n sales, and shivering homeowners, is far higher than the s le dollars and cents spent to protect the power system. A recent report from the National Academy of Sciences about the vast 2003 blackout in the Eastern United States determined that the economic cost of that disruption was about 50 times higher than the price of the actual electricity lost, and that didn't take into account deaths or other human consequences.

"We need to think now of not just restoring the grid, but how to make it more survivable," said Philip B. Jones, president of the National Association of Regulatory Utility Commissioners, a trade association of state officials. "I think most commissioners are coming around to that."

After Gov. Chris Christie of New Jersey and Gov. Andrew M. Cuomo of New York traveled to Washington to lobby for aid, the Obama administration proposed a broad $60 billion recovery package, including several billion dollars that could be used to protect the utility infrastructure from storms.

> The costs of cleanup are typically far cheaper, but that is changing.

"The governor decides if the utilities are deserving and eligible for getting some of that assistance," said Kevin Lanahan, director of governmental relations at Con Ed. "But we've never had discussions on this scale, at least in the Northeast. So we're not certain how that might go."

Political leaders, who have traditionally pressed to keep consumer rates low, are also talking in New York, New Jersey, Connecticut and other states about raising rates — perhaps gradually over many years — to pay for improvements.

This year, after Maryland was hit by several storms, the state's governor, Martin O'Malley, even took the unusual step of asking regulators to raise electric rates by a dollar or two a month to allow utilities to do more preventive work. Abigail R. Hopper, his chief energy adviser, compared the process to losing weight. "It might take you a while to get to your goal, but you start feeling better and better," she said.

Ralph A. LaRossa, president and chief operating officer of the Public Service Electric & Gas Company, New Jersey's largest utility with 2.2 million customers, said during hearings in Trenton that what the governor, legislators, utility regulators and the utilities "need to do is price out what the optimum solution would cost and do a cost-risk analysis — how much are we willing to pay for minimum risk, how much risk are we willing to live with? — and then come up with the best solution for the customers."

He said that the utility's costs for restoring service after Hurricane Sandy could run to $300 million. But utilities in the state are now considering whether to move some 32 electrical substations — critical relay points where power voltages are reduced for distribution to many homes and businesses — that sit in 100-year flood zones.

Mr. LaRossa estimated that it would cost $10 million to $15 million to build each new substation and $120 million to build each new switching station, where power is routed to different areas.

Another solution, he said, could be to build greater redundancy into the network. For example, P.S.E.& G. has bought land inland from Newark, where most residents lost power from storm surges during the hurricane, to build a new station that could continue to serve the city if older substations flooded.

Such public discussions of more prevention reflect a major change in thinking. Traditionally, utilities have focused largely on tree-trimming and sandbags to ease storm damage, and politicians and regulatory commissions have discouraged spending to protect against what seemed to be the long odds for catastrophic storms.

FRED R. CONRAD/THE NEW YORK TIMES

A staging site for repair crews in Paramus, N.J. The state's utilities are considering costly plans to brace their systems for storms.

CHRIS PEDOTA/THE RECORD VIA ASSOCIATED PRESS

Ralph LaRossa of the Public Service Electric & Gas Company said his utility's costs from the storm could reach $300 million.

"It was pretty widely understood that things like subway tunnels and underground facilities, including substations and junction boxes, were all very vulnerable," said M. Granger Morgan, director of the Center for Climate and Energy Decision Making at Carnegie Mellon University in Pittsburgh. "The difficulty is it's a low-probability event, and they're operating with pretty limited budgets."

After a series of storms, including Hurricane Irene, hit New Jersey in 2011, public anger and regulatory oversight in that state focused mainly on poor communication by the utilities and their sluggish efforts to restore power.

Even if many consumers now agree that more prevention is needed, they will undoubtedly differ over how much they can afford to pay for it, and state rate commissions plan to hold hearings to weigh their views.

Paula M. Carmody, the Maryland state official who represents consumers before the public service commission, said the high costs of preventive measures raised fairness questions that until now have been mostly unexamined.

If the electric system's reliability is judged to be "a societal issue," she said, then the political system should consider using tax dollars. High-income people might be happy to pay extra on their bills to reduce the chance of blackouts, or might buy backyard generators, but poorer people may not be able to afford higher bills, she said; if the improvements are paid for through income taxes, the poor are not so burdened and universal access to electricity is maintained.

Under President Obama's proposal to Congress, $2 billion would specifically be devoted to utility projects, while the governors in New Jersey, New York and Connecticut would also be able to apportion parts of more than $15 billion in other grants for that task.

Referring to that aid, which Congress must still approve, Jeanne M. Fox, a Democrat on the New Jersey Board of Public Utilities, said, "We'll work with what we've got."

"The more we can get from the federal government, the less our ratepayers will have to pay," she said.

Attachment "3G"

NJ SPOTLIGHT
WHERE ISSUES MATTER

Sandy Spurs New Look at Underground Power Lines, Grid Upgrade

State BPU chief warns NJ ratepayers would foot bill for 'incredibly expensive' measures

By Tom Johnson, November 21, 2012 in Energy & Environment

Credit: PSEGpics

Hurricane Sandy has prompted utility regulators to take a new look at measures New Jersey has shied away from in the past – including replacing some above-ground power lines with underground systems -- largely because of the huge price tag that likely would jack up electric rates for consumers.

In the next few months, the state Board of Public Utilities, however, plans to explore the possibility of "selective" burying of underground lines. It also will examine whether to require utilities to create a "smarter" power grid, a step some say would lead to faster restoration of power in the wake of powerful storms like Sandy.

Neither of those options would be cheap. In the past, for instance, the BPU has balked at allowing Public Service Electric & Gas, the state's largest utility, to take steps toward creating a "smart" grid, primarily because of projected costs running into hundreds of millions of dollars.

Related Links

New Jersey's Aging Power Plants Another Casualty of Sandy

Opinion: What Sandy Should Have Taught Us

Storm Costs Won't Necessarily Spell Budget Disaster

Utilities Restore Power After Storm But Ratepayers Will Pick Up the Bill

The reassessment, which will include public hearings around the state, comes in the wake of a hurricane which left a record 2.7 million customers without power, some for as long as 14 days. On the hard-hit barrier islands along the Jersey Shore, many are still without any electricity or gas service, some not to be restored until next month.

Beyond burying overhead power lines and creating a smarter grid, the state agency also plans to determine what needs to be done to relocate, elevate or harden electric utility substations and switching stations.

All told, Hurricane Sandy flooded 58 utility substations, more than four times the number flooded during Hurricane Irene, according to BPU President Bob Hanna. When those substations are knocked out of service, tens of thousands of customers lose power.

"We're going to think very seriously about moving substations or elevating them," Hanna said at the first public meeting of the BPU since Sandy made landfall on Oct. 29 near Atlantic City. "It happened once; it can't happen again."

Actually, it already occurred during Hurricane Irene, when 14 utility substations in low-lying areas were flooded, leading to widespread outages.

In talking about how the state should respond in the aftermath of Sandy, which claimed the lives of 37 New Jerseyans, Hanna detailed a range of other issues which need to be addressed -- from improving communication from electric utilities to local officials to better vegetation-management practices to reduce outages caused by falling tree limbs.

"The board has much work to do," Hanna conceded.

One of the big issues facing the state is weighing the costs and benefits of improving the utility infrastructure to respond more quickly to storms like Sandy, which will almost certainly happen again, he said.

"Extreme weather is a fact of life" he said. "It's going to continue to occur."

Hanna's fellow BPU commissioner, Jeanne Fox, echoed those comments.

"I'm hoping and praying that Sandy is a wakeup call," said Fox, while saying the hurricane was not directly a result of global climate change.

Burying power lines would be "incredibly expensive," Hanna said, adding that it would cost "billions of dollars" if the state tried to bury all overhead lines in New Jersey, a process that would involve ripping up most roads and front lawns.

He suggested the state needs to examine selective burying of underground lines after a detailed cost-and-benefit analysis. Placing substation feeder cables might be one option, he added.

Creating a "smarter" grid would also result in additional costs for ratepayers, but Hanna noted that in Delaware, where nearly the entire state has been converted to an upgraded power grid, utilities have been better able to respond to power outages.

"We have to study the costs and benefits of all these items I mentioned and make sure they are worth it," Hanna said.

PSE&G did a study several years ago and found that implementing a "smart" grid would cost the average homeowner $200, according to Michael Jennings, a spokesman for PSEG Power, a subsidiary of the company.

"These were ballpark figures," Jennings said. "There was a lot of opposition and we haven't pursued it since."

TOWN OF SURFSIDE
PUBLIC NOTICE

TOWN OF SURFSIDE, FLORIDA
FPL UNDERGROUNDING PUBLIC INFORMATION MEETING

THE TOWN OF SURFSIDE WILL HOLD A MEETING TO DISCUSS FPL, ATLANTIC BROADBAND & AT&T UNDERGROUNDING AND PROPOSED ACTIONS ON THE FOLLOWING DATES:

THURSDAY, JANUARY 10, 2013 – SINGLE FAMILY NORTH (93rd – 96th West of Harding)
WEDNESDAY, JANUARY 16, 2013 – SINGLE FAMILY MIDDLE (90th – 93rd West of Harding)
TUESDAY, JANUARY 29, 2013 – CONDOS
WEDNESDAY, JANUARY 30, 2013 – DOWNTOWN
MONDAY, FEBRUARY 4, 2013 – SINGLE FAMILY SOUTH (88th – 90th West of Harding)

MEETINGS WILL BE HELD AT 7:00 P.M. IN THE TOWN COMMISSION CHAMBERS AT 9293 HARDING AVENUE, SURFSIDE, FLORIDA.

IF YOU ARE UNABLE TO ATTEND THE MEETING IN YOUR DESIGNATED AREA, YOU ARE WELCOME TO ATTEND ON ANY OF THE OTHER SCHEDULED DATES.

In accordance with the ADA persons with disabilities requiring accommodations in order to participate in this public hearing should contact the Office of the Town Clerk at (305) 861-4863 no later than two business days prior to such proceedings.

Please note that one or more members of the Town Commission may be present at this meeting.

Sandra Novoa, CMC
Town Clerk

Town of Surfside

FPL Undergrounding Project
Frequently Asked Questions (FAQs)
Surfside Florida Specific
January 9, 2013

Q: What is this undergrounding project about?

A: There are currently 23 miles of above ground electric cable, 537 poles and 278 overhead transformers in Surfside. There are also miles of above ground AT&T and Atlantic Broadband cables and related devices. All of this will be gone when the project is complete.

Q: What will replace all this?

A: Fifty miles of electric cable, 24 waterproof electric switching devices, 307 transformers and 22 splice boxes. There will also be boxes for cable and telephone. All cables will be underground and any above ground boxes or switches will be located at lot lines to the best of our ability.

Q: Can I landscape around of these boxes?

A: Yes, as long as the landscape does not deny access to the box.

Q: Why go to all this trouble?

A: First and foremost is reliability. Our above ground system is 50 years old and has been depreciated to $104,000 on FPL's books. Similar low numbers exist for cable and telephone.

Second, there is broad consensus that hurricane wind damage to below ground systems is much less than above ground systems. Flood surge recovery has less consensus. That is why this project includes waterproof switch gear boxes. The transformers on the ground are relatively easy to replace compared to replacing a pole particularly if that pole is in a backyard.

Q: Have there been any studies by independent groups on the speed of recovery issue or the cost effectiveness of these underground projects?

A: There have been a number of studies and all reach different conclusions. These studies are available on the Town website and you are invited to draw your own conclusions.

Q: What will this project cost?

A: The project will cost $8.2 million including FPL, Atlantic Broadband and AT&T. Negotiations are underway with the cable and telephone providers to lower their costs. FPL has reduced its costs by 25 percent due to the "hardening" of this system as required by Florida law and the Public Service Commission.

Q: How will the Town pay for this?

A: Depending on the cost reductions available from the cable and telephone companies, the cost will be funded with a $12.00 per month surcharge on electric bills for residents and a $20 - $50 per month surcharge for commercial businesses if the debt is paid off in 15 year. If it is paid off in 20 years, the cost will be $10.00 per month.

Q: How many customers of FPL are there in Surfside?

A: There are 3501 residential customers and 230 commercial customers.

Q: Is it fair that folks who are already underground should help pay for this project?

A: Yes. The underground areas today were not paid for by the builders of the projects along Harding and Collins Avenues so the underground cost was not included in the price of the original units. These undergrounding costs were funded by the FDOT when Collins and Harding Avenues were upgraded so everyone's gas taxes paid the cost including non Surfside residents. Further, we are a community where everyone will benefit by the aesthetic and reliability benefits and our downtown will be much improved.

Q: Will my property value increase when the project is complete?

A: Most likely, however, property values are governed by many complex factors including investment in the property itself and the market factors for real estate in general.

Q: Okay, enough with the big picture. What will be in front of my house?

A: A six square foot transformer box painted green, located to the best of our ability on property lines. You may also have a small telephone or cable box, however, these appear much less frequently then the transformer boxes.

Q: You just replaced a portion of my driveway for the water/sewer/storm drainage project. Here we go again.

A: We understand. We will bore under your driveway and it will not need to be replaced.

Q: What about the street, you just repaved it?

A: The Town spent $300,000 to install the conduits in any location where the former above ground wires cross the street. FPL provided the conduit at no cost to the Town. The undergrounding project will not need to break the new asphalt.

Q: Will my yard have to be dug up again?

A: Yes. The wires that go to your house above ground will come in below ground. Just as we did with the water service, there will be an individual plan to bring the wires on your property. We will work with every impacted property to minimize the impact.

Q: That sounds expensive. Do I have to pay?

A: Just like the water service, the project absorbs that cost from the easement to your house.

Q: My house is very old. Will I have to pay to upgrade my wiring and my panel?

A: Possibly. There are perhaps 100 homes in Surfside with very old electric service which is unsafe and does not meet current codes. We will work closely with every home in this condition to minimize the cost to improve safety related issues and you will have better service as a result.

Q: Wait a minute, I am on a fixed income and can't afford the monthly cost plus the upgrade.

A: There will be a program where truly fixed income people without assets will have the upgrade funded by the Town with the loan to be repaid when you sell the house.

Q: We just suffered through a year of water/sewer/storm drainage construction. Here we go again.

A: We feel your pain. The construction for the underground project will not start for at least a year. It also goes quickly since the new wires go in the 5 foot easement the Town controls and the entire road does not have to be replaced. The Town will be divided into three areas which will require 4-6 months each. We will start on the South side again.

Q: Do you energize one home at a time with the new system? Will I have a break in service?

A: No. An entire group of homes must be energized with the new system and then the poles can be removed. Every home or business in a defined area must be connected before the area is

converted. Not one home or business will be left out and the downtime is very brief and you will be notified well in advance.

Q: Times are tough and this is not a necessity. Why not wait?

A: There are a number of reasons to move forward. The first is that we have a time limit of the end of March, 2013 to decide. This time limit is established by the laws and policies which govern FPL undergrounding programs. Second, the cost of construction is about as low as it will get. The building industry is starting to recover and interest costs are very low. The loan necessary for this project is projected to carry a 3 percent interest rate.

Q: Will we lose any money if the project does not move forward?

A: We spent $58,000 for the FPL study. That will be lost. There is also $300,000 worth of conduit in the ground that could be used if the project is done in the future.

Q: Okay, you convinced me that this is a good thing. Is there any other way to pay for it?

A: Yes. A voted assessment district which requires a 50 percent plus one majority. The assessment would go on your tax bill.

Q: What if I am opposed to the project? How do I express that opposition?

A: Come to any or all of the five public meetings and express your opinion. You will also have an opportunity in the final decision making discussion at the February 12, 2013 and March 12, 2013 Town Commission meetings to express your opinion. This is and will continue to be a very open process and your input is welcome and encouraged.

Q: One final question. Can I get AT&T U-verse if this project occurs and will the Town Commission meetings be broadcast?

A: We are working on that with AT&T and the answer looks good.

Frequently Asked Questions

General Service

What is FPL's standard service?
FPL and other utilities use the overhead standard established by the Florida Public Service Commission (PSC) as the most cost-effective type of construction. However, we are open to putting lines underground provided the additional cost is covered by or for the customer.

Why was overhead established as the standard?
Overhead service was established as the standard construction for utilities because over time it has been the most cost-effective design. When alternatives like underground service are requested by developers or mandated by cities, the customer benefiting from the alternative design pays the additional cost.

How many miles of distribution power lines does FPL have in its system?
FPL has approximately 66,000 miles of distribution lines serving its 4.4 million customer accounts in all or part of 35 counties in Florida. In addition, we also have about 6,600 miles of transmission lines. More than one-third of FPL's system – or in excess of 24,500 miles – is underground. Often, the costs of this service are borne by builders and developers who pass it along to the customer in the price they pay for newly constructed real estate. However, it's important to remember that lines eventually come above ground, so no system is totally underground.

Underground Electric Service Delivery

What are the different strengths and weaknesses of overhead and underground service that affect performance and reliability?
While underground facilities are not as susceptible to wind and debris-blown damage, they are more susceptible to water intrusion and local flood damage, which can make repairs more time consuming and costly. Overhead facility damage is easier to locate than underground and can generally be repaired quicker. Underground interruptions may be less frequent, but typically last longer due to more complex repair requirements. Following recent hurricanes, we've found that the areas that took the longest to repair were generally those served by underground facilities still flooded days after the storm passed. Damage and corrosion of underground electrical systems often becomes apparent days or even months later, causing additional outages and inconvenience to customers. Storm winds can damage both types of systems causing outages. Overhead systems face outages resulting from trees and debris blowing into lines. Underground systems face outages from trees collapsing on above-ground transformers and switch boxes or from tree root systems uprooting buried cable when trees topple. While a neighborhood may be locally served by underground cable, all electric service eventually comes back above ground and connects to an overhead system, either in the surrounding neighborhoods, or further down the street. So, exposure to above ground electric service from weather, animals, and trees is never fully eliminated.

Why don't you put transmission lines underground?
FPL transmission lines – that is, those large power lines that move power over long distances like an interstate highway from power plants to our neighborhoods – are rarely ever placed underground due to their complexity and considerably higher costs, as well as security and reliability considerations. For example, depending on the voltage of the lines we may need to build a cooling system underground escalating the cost of the project. These factors can drive the cost up five to fifteen times more than an overhead transmission line.

Costs

Why is there a differential cost for underground service? Why must the customer or requesting party pay the differential cost of that service?

The PSC has established that overhead facilities are the most cost-effective type of service. In fact, the costs of these facilities are included in the electric rates charged to customers. Whether its new construction or a conversion project, the cost of underground service is higher than overhead and it is the PSC's and FPL's position that it would be unfair to charge all customers the higher price to cover the cost since not everyone would get the benefit or necessarily be willing or able to pay.

But I live in a community with underground service and I didn't pay anything extra – why is that?

You may not realize it, but you have. For aesthetic reasons, many developers work with FPL and other utility companies to bury their lines when they are first planning the construction of a new neighborhood. The added cost for underground service and other community amenities is typically included in the price you pay for a new home.

What does underground service cost in a new subdivision, versus new overhead service?

Usually, the basic costs are about a third more, but may be even more if additional work is needed on supporting electrical facilities, such as putting a section of an adjacent main line underground. The builder/homeowner is responsible for paying the cost difference between new overhead and new underground facilities prior to construction. The detailed cost components are provided in an FPL tariff that is available from your local FPL project manager [see FPL Electric Tariff sheets 6.090-6.100].

Just for comparison, and using a sample subdivision, can you give me a rough idea of the difference in cost to install standard overhead service versus underground service in new construction?

Depending on the density of a new development and exclusive of other facility needs, it costs FPL between $736 and $1,161 per lot to install our standard overhead service. Underground on the other hand, costs between $973 and $1,605 per lot. Thus, the builder/homeowner selecting to have underground service pays $236 to $444 on average per lot in differential cost. In addition, if main feeder lines are required to serve the subdivision, and the developer requests those be placed underground also, there is an additional differential charge of $11.56 per foot of main line and $20,365 per installed pad mounted switch cabinet. In a typical 100 lot subdivision needing main feeder work and about two switch cabinets and related equipment, this could add an additional $50,000 to the project, doubling or tripling the per-lot differential cost.

When converting existing service, what other additional costs may be incurred that are normally not an issue with new developments?

In conversion projects, the customer will be responsible for any additional costs not included in FPL's estimate, such as:

- **Relocation of other utilities** – To bury or relocate other utility lines such as cable and telephone.
- **Hiring licensed electrician** – To make the home ready to receive underground service.
- **Site restoration** – To restore the affected areas by repairing driveways, landscaping, etc.

What are the requirements for a project to qualify for the 25 percent Government Adjustment Factor (GAF) CIAC incentive?
To be eligible for this CIAC incentive, the project must be sponsored by the local government. As such, the project must incorporate a sufficient amount of overhead facilities which includes a minimum of approximately three pole line miles or approximately 200 detached dwelling units within a contiguous and well defined geographic area. The local government must then require all customers within the conversion area to convert their service entrances, such as the service drop and weatherhead, to underground within 6 months of completion of the underground facilities installation. These criteria help ensure that potential underground service benefits are not affected by facilities that are exposed to causes of overhead outages. The local government will be responsible for paying the remaining 75 percent of the CIAC.

Residential Conversions

What are my options if I live in an established neighborhood served by overhead electrical service and I want to convert my service to underground?
You may personally arrange to have your individual service drop converted from overhead to underground, or seek conversion of all the neighborhood electrical facilities, through your city or homeowners association. Converting an older community's power lines from overhead to underground, however, can be very expensive and disruptive, especially in highly urbanized areas. With conversions, the customer pays the total cost of the conversion, since the existing electric service must be dismantled in addition to installing a whole new underground system.

What's involved in converting my service drop?
Customers who wish to have the line to their home buried will also need to convert the meter can and downpipe to accept underground service. This requires a licensed electrician and, in most cases, an electrical permit. Since this work may trigger building codes that require older home wiring to be brought up to today's standards, it's important to check with the proper authorities before getting started. Homeowners also need to arrange for a trench to be dug from the pole to the new meter location to hold FPL-provided PVC for the underground cable.

Can you be more specific about some of the costs I may be facing if I pursue converting my individual overhead service to underground?
To convert your service, a flat fee of $429.39 would be due to FPL before work begins, along with possible additional costs that depend on a number of variables such as:

- Whether your local government's electrical authority requires electrical installation or wiring to be upgraded as part of your conversion.
- Whether an electrician (or another tradesperson) will do the work to dig and backfill the trench needed to bring the underground facilities from the existing overhead pole location to the building. (i.e. from the pole to the meter)
- The length of trench that's needed to accommodate the conversion.
- Whether the existing overhead weatherhead extends through the roof of the building, in which case, you may need to incur the cost of roof repair as well as paint and aesthetics. These costs and arrangements are separate from the work FPL would handle and are the responsibility of the customer.

Community Conversions

Who can request that all overhead facilities in a community be converted to underground?
Existing neighborhood overhead lines may be converted if a community so desires. Anyone willing and able to pay the cost for the conversion and secure the necessary easements to place the underground facilities on private property may submit a written request. The request may be received from local governments, large or small communities, builders and developers.

Does conversion from overhead to underground require a unanimous agreement from all property owners within the conversion area before FPL will convert its facilities to underground?
Generally, yes due to the following conditions for such conversion:

- **Easements** – All the easements (property use agreements from owners) must be acquired before an underground electrical distribution system can be installed. If FPL can design around an occasional customer who refuses to provide an easement -- without jeopardizing the integrity of its electrical system -- FPL will attempt to do so. In the case of converting to underground, this also means deciding whose property will accept the new pad mounted transformer(s) and fairly large switch cabinet(s) that sit above ground as part of the underground grid.
- **Cost –** It's also necessary for all the requesting parties to determine and agree in advance on the allocation of the conversion costs among those benefiting from the project before FPL can begin construction. Otherwise, subsequent disagreements may slow the conversion effort and drive up costs. Since FPL's tariff requires full payment of the calculated customer contribution amount prior to beginning construction, customers may want to consider other options to offset some of the project costs. These options can include taking responsibility for doing some of the boring and/or trenching and installing the conduit. Regardless of who does the work, the installation must meet FPL standards for safety and reliability, as well as, local electrical and building code requirements.

What are some of the impacts associated with converting an older overhead system to new underground?
Converting from an overhead to an underground system basically means abandoning an existing working electrical system. The logistics of converting an existing system in an established neighborhood can be considerably more expensive and disruptive to personal property and surroundings than building new. For example, utilities often share poles above ground. If the objective is to move utilities underground the phone, cable television and Internet service must also be considered. This presents additional considerations, such as different spacing requirements, boring and/or trenching needs and ground-level switching boxes involved in providing each type of service. Driveways, sidewalks, fences, landscaping, sprinkler systems and yards may need to be torn up or may be inadvertently damaged if not clearly delineated. Entry and exit ways to homes and business could be impacted for extensive periods of time. Because permits are needed to change meter-related equipment, conversions of older homes and neighborhoods may trigger city or county requirements that homeowners/businesses bring interior wiring up to current code. This could require the expense of a licensed electrician and potentially extensive interior rewiring and remodeling. Finally, legal easements are needed from all conversion participants that allow FPL access to its underground equipment, including the above ground components – and a number of people must agree to have the large green transformer box and pad or other switching boxes in their yards.

Community Conversion Costs and Funding

Are there different ways the conversion of a full neighborhood or city might be financed?
Yes. For qualified local governments, the PSC has approved FPL's recently established mechanism to recover the costs associated with converting from overhead to underground by adding a fee to customer bills. Additionally, Chapters 197 and 170 of the Florida Statutes allow municipalities to fund underground conversion costs by levying special assessments imposed on tax bills. Landowners benefiting from the conversion must be identified and the special assessment may be collected directly from the local government imposing the assessment or through annual property tax bills. Another Florida Statute – 125.01(q) – allows counties to establish municipal service benefit units and municipal service taxing units in certain areas. These governmental units may levy service charges, special assessments or taxes within these units to fund underground conversion costs.

What is the Government Adjustment Factor (GAF) and what are the requirements to receive this incentive?
To help with the high cost of overhead-to-underground conversions, FPL has proposed invest 25 percent of the Contribution-In-Aid-of-Construction (CIAC) of converting overhead lines to underground for qualifying local government-sponsored conversions. In June 2007, the proposal received final approval from the Public Service Commission for qualifying local government sponsored conversion projects.

To be eligible for this CIAC incentive, the project must be sponsored by the local government. As such, the project must incorporate a sufficient amount of overhead facilities which includes a minimum of approximately three pole line miles or approximately 200 detached dwelling units within a contiguous and well defined geographic area. The local government must then require all customers within the conversion area to convert their service entrances, such as the service drop and weatherhead, to underground within 6 months of completion of the underground facilities installation. These criteria help ensure that potential underground service benefits are not affected by facilities that are exposed to causes of overhead outages. The local government will be responsible for paying the remaining 75 percent of the CIAC.

How does the FPL undergrounding tariff work?
In 2003, FPL established a PSC-approved rule and process (tariff) for cities that wanted to have the option of converting to underground in designated areas and who needed a mechanism to recover their costs. Under this new tariff, a city could pay to make the conversion and then recover its costs over a designated timeframe by having FPL add an underground fee on the bills of those customers in their jurisdiction who would be benefiting from the conversion. (Fees may not exceed [1] 15 percent of a customer's bill or [2] $30 for residential and $50 for every 5,000 kWh commercial.) No such arrangements have as yet been established in our service territory under this new tariff.

What might it cost to convert from overhead to underground service in a community?
The two key drivers contributing to the cost calculations are labor and materials. Depending on these factors, underground facilities can cost anywhere from $500,000 per mile to more than $4 million per mile. While these figures have a considerable amount of variability, there is a process in place where FPL generates a "ballpark" estimate to assist in determining the magnitude of the cost a community may be considering.

What makes it so much more expensive to do conversions versus new construction, especially considering that the customer pays for most of the peripheral work?
With conversions, FPL's costs are significant. The work includes build
ing a whole new system while operating the existing system. Then, the older system is dismantled once the new one is up and running. The higher costs also reflect the fact that conversions in older neighborhoods – regardless of the type of excavation we use (boring or trenching) – require working near and avoiding other utilities such as phone, cable, sewer, gas lines, water lines, etc. Finally, all new underground components must be acquired and installed, including conduit, cable (wire), pad-mounted transformers and switch cabinets. Typically, dismantling represents about 15 percent of the cost; installing underground components about 65 percent; and actual excavation about 20 percent.

What will it cost to bury the other utilities such as telephone and cable television?
This question will need to be addressed by the other utilities involved in the conversion.

What experience does FPL have assisting any groups with evaluating or actually performing a conversion?
Actually, our experience is limited, as many government entities or neighborhoods have abandoned the idea after fully investigating the impacts. In other cases, voters have determined the disadvantages of conversion outweighed the advantages, and have failed to authorize funding. Some exceptions have involved city-initiated, limited-scope conversions involving primarily a few downtown streets, such as in beach towns in Miami-Dade, Broward, Palm Beach and Sarasota counties.

What are some examples of instances where proposed overhead to underground conversions would not be feasible?
Instances in which private property owners aren't willing to provide the easements that are necessary for FPL to design and engineer the conversion. Also, locations where necessary safety standards and operational clearances cannot be met such as extremely congested areas where switch cabinets cannot be installed with sufficient operating clearances. Areas prone to flooding as excessive flooding can cause transformers to fail, which then cannot be safely restored until flood waters recede.

Construction Requirements

Can the requester have a contractor perform the conversion work?
Yes, that's an option. The tariff requires only that the work be preformed to FPL standards and the facilities be maintained and operated by FPL.

If easements are difficult to obtain, why not place underground facilities in the public right-of-way instead of on private property?
Typically, the only underground facilities FPL places in the public right-of-way are those necessary to cross under streets, like cable and conduit. The reason is that, otherwise, every road widening or improvement project could potentially compromise the company's ability to deliver safe, reliable, uninterrupted power. On the other hand, if a local government offered FPL an easement or equivalent (a signed legal agreement) in the public right-of-way, we would consider this alternative only if we could not physically install the cable on private property. Only cable and conduit are allowed in the public rights-of-way in these rare cases. These public right-of-way easements would also need to be legally conveyed and expressly reserved on FPL record drawings. However, it's been our experience that local governments are reluctant to grant such right-of-way easements or easement equivalents. As for other facilities and equipment needed for underground – such as primary splice boxes, transformers and switch cabinets – these components of the underground system would still need private property easements for us to be able to routinely access and maintain the equipment and ensure reliable service.

Why must the easements associated with underground facilities be at least 10 feet wide?
Ten feet is our standard easement requirement for "front" distribution neighborhoods to provide: (a) adequate space for the necessary pad-mounted transformer and underground cables; (b) sufficient area for FPL crews to safely work away from roadways; and, (c) enough room for other utilities that might occupy the same easement to install future cable and conduit without interfering with the electric transformers located in the same vicinity. Each pad mounted switch cabinet requires a 20 foot by 20 foot easement for installation and operation.

Does FPL perform overhead to underground conversions in rear easements?
Front easements are required for new construction and are also typically required for conversions from overhead to underground, as they allow for quicker access to the facilities. Should a power outage occur, facilities in the rear of a property may be inaccessible due to locked gates or dogs. The inability to access transformers and other equipment could delay the restoration of an entire neighborhood. FPL would consider locating easements in the rear of the property if an access road or alley existed that would allow for quick access to the facilities. The 10-foot easement requirement will still apply.

In the case of conversions, what is FPL's preferred method of burrowing underground to lay cable and conduit and why?
Directional boring is generally preferred in conversions to minimize impact to other utilities that are generally buried higher in the ground than electrical conduit and cable. Directional boring, while it may save on site restoration costs, is substantially more expensive work to perform. Open trenching is usually preferable for the paying party because it is the least expensive method available. An advantage of trenching is that other underground utilities may use the same trench, reducing the collective cost of burying all different facilities. This, however, requires significant coordination. A disadvantage of open trenching is the amount of surface restoration required — such as landscaping and sidewalks. Given that the locations of other utilities are not always known, especially in older communities, there is still a risk both trenching and boring may impact other subsurface utilities, such as water and sewer lines, gas lines or drainage lines.

Why must some of the equipment in an underground system remain above ground?
While conduit and cable can be placed underground, which eliminates poles and wires, transformers and switch cabinets need to be at ground level and accessible to FPL crews for timely maintenance, outage repairs, rerouting power and other functions.

Requests & Estimates

How long does it take to get a "ballpark" estimate?
Typically, it may take from two to three weeks. This time period may vary depending on several factors such as:

- The complexity of the job
- Geographic size of the area to be converted
- Facilities involved and type of equipment needed
- The electrical load being served, including the population density and number of switch cabinets required
- The current workload of FPL project managers

How does FPL ensure the "ballpark estimates" are consistent throughout the territory?
FPL is establishing a comprehensive, standard plan and process that takes into account the many types of facilities and different population densities across the system. The "ballpark estimate" is simply an order of magnitude (for example – $5,000 vs. $500,000) to assist the requestor in determining whether to move forward with a conversion project and seek a binding estimate. Unfortunately, due to innumerable variables, there is no single blanket cost.

Can FPL provide a simple cost or range of cost for conversion from overhead to underground based on dollars per linear foot?
No. There are just too many factors and variables that are unique and distinct to each conversion request.

How long does it take to get a detailed, binding estimate?
Typically it takes approximately 10 to 16 weeks (pending agreement on easement locations) to obtain a binding estimate. However, this timeframe may vary due to the size and complexity of the job, the facilities involved and other factors.

How does FPL ensure the binding estimates are consistent throughout the territory?
All actual "for construction" estimates are valid for a period of 180 days where all material and labor are inventoried in a computer-based estimating system. This is the same system used for construction estimates for all FPL work system-wide. In addition, the PSC rule governing overhead to underground conversions specifies exactly how the charges are to be calculated [see Florida Administrative Code 25-6.115, and FPL's Electric Tariff sheets 6.300 – 6.330, specifically].

Are any credits available for existing facilities that can be salvaged and will they be factored into my estimate?
Some salvage credits may be available. Salvage value is only given for equipment that can be removed from the field and then re-issued for use with no testing or refurbishing required before re-use, such as concrete poles. Typically these credits are not significant [see FPL Electric Tariff sheet 6.300].

Town of Surfside
Underground Utilities Project
Annual Debt Service Cost Allocation

	Initital Debt	Additional Debt		
	FPL ELECTRIC	Atlantic Broadband Cable	AT&T Telephone	TOTAL
Project Principal	$ 6,200,000	$ 1,000,000.00	$ 1,000,000.00	$ 8,200,000.00
Debt Service Reserve Fund	620,000	100,000	100,000	820,000
Cost of Issuance	50,000	-	-	50,000
Total	6,870,000	1,100,000	1,100,000	9,070,000
Less: Developer Voluntary Proffers		(275,000)	(275,000)	(550,000)
Total Loan		825,000	825,000	8,520,000
Annual Debt Service * (Principal/Interest)	575,500 (1)	55,500 (2)	55,500 (2)	686,500
Debt Service Allocation				
FPL Customers	575,500			575,500
Town of Surfside		55,500	55,500	111,000

FPL Customers Cost Allocation Per Month

	#Units	Assessment	Months	Total Revenue
Residential	3501	$ 12.00	12	$ 504,144
Commercial	230	$ 20.00 - 50.00 **	12	$ 75,900
Total	3731	$ 30.00	12	$ 580,044

(1)Annual Debt Service based on the following:

Issuance Date	4/1/2013
Interest Rate	3.00%
Loan Term (yrs)	15

(2)Annual Debt Service based on the following:

Issuance Date	4/1/2013
Interest Rate	3.00%
Loan Term (yrs)	20

**Commercial Average $27.50

Attachment "6A"

Town of Surfside
Underground Utilities Project
Annual Debt Service Cost Allocation

	Initital Debt	Additional Debt		
	FPL ELECTRIC	Atlantic Broadband Cable	AT&T Telephone	TOTAL
Project Principal	$ 6,200,000	$ 1,000,000.00	$ 1,000,000.00	$ 8,200,000.00
Debt Service Reserve Fund	620,000	100,000	100,000	820,000
Cost of Issuance	50,000	-	-	50,000
Total	6,870,000	1,100,000	1,100,000	9,070,000
Less: Developer Voluntary Proffers		(275,000)	(275,000)	(550,000)
Total Loan		825,000	825,000	8,520,000
Annual Debt Service * (Principal/Interest)	575,500 (1)	69,500 (2)	69,500 (2)	714,500
Debt Service Allocation				
FPL Customers	575,500			575,500
Town of Surfside		69,500	69,500	139,000

FPL Customers Cost Allocation Per Month

	#Units	Assessment	Months	Total Revenue
Residential	3501	$ 12.00	12	$ 504,144
Commercial	230	$ 20.00 - 50.00 **	12	$ 75,900
Total	3731	$ 30.00	12	$ 580,044

(1)Annual Debt Service based on the following:

Issuance Date	4/1/2013
Interest Rate	3.00%
Loan Term (yrs)	15

(2)Annual Debt Service based on the following:

Issuance Date	4/1/2013
Interest Rate	3.00%
Loan Term (yrs)	15

**Commercial Average $27.50

Town of Surfside
Underground Utilities Project
Annual Debt Service Cost Allocation

	Initital Debt	Additional Debt		
	FPL ELECTRIC	Atlantic Broadband Cable	AT&T Telephone	TOTAL
Project Principal	$ 6,200,000	$ 1,000,000.00	$ 1,000,000.00	$ 8,200,000.00
Debt Service Reserve Fund	620,000	100,000	100,000	820,000
Cost of Issuance	50,000	-	-	50,000
Total	6,870,000	1,100,000	1,100,000	9,070,000
Less: Developer Voluntary Proffers		(275,000)	(275,000)	(550,000)
Total Loan		825,000	825,000	8,520,000
Annual Debt Service * (Principal/Interest)	461,500 (1)	69,500 (2)	69,500 (2)	572,500
Debt Service Allocation				
FPL Customers	461,500			461,500
Town of Surfside		69,500	69,500	139,000

FPL Customers Cost Allocation Per Month

	#Units	Assessment	Months	Total Revenue
Residential	3501	$ 10.00	12	$ 420,120
Commercial	230	$ 20.00 - 50.00	12	$ 55,200
Total	3731	$ 30.00	12	$ 475,320

(1)Annual Debt Service based on the following:

Issuance Date	4/1/2013
Interest Rate	3.00%
Loan Term (yrs)	20

(2)Annual Debt Service based on the following:

Issuance Date	4/1/2013
Interest Rate	3.00%
Loan Term (yrs)	15

Attachment "6C"

TOWN OF SURFSIDE

Utility Undergrounding Q&A

Frequently Asked Questions

When considering a major project such as the undergrounding of electric, cable and other utility lines, the Town of Surfside seeks to provide information to residents so that informed decisions can be made while contemplating the conversion.

Q: What is this undergrounding project about?

A: There are currently 23 miles of above ground electric cable, 537 poles and 278 overhead transformers in Surfside. There are also miles of above ground AT&T and Atlantic Broadband cables and related devices. All of this will be gone when the project is complete.

Q: What will replace all this?

A: Fifty miles of underground electric cable, 24 waterproof electric switching devices, 307 transformers and 22 splice boxes. There will also be boxes for cable and telephone. All cables will be underground and any above ground boxes or switches will be located at lot lines to the best of our ability.

Q: Why must some of the equipment in an underground system remain above ground?

A: Conduit and cable can be placed underground, which eliminates poles. Switch cabinets need to be accessible to utility crews at ground level for timely maintenance, outage repairs, rerouting power and other functions.

Q: Can I landscape around these boxes?

A: Yes, as long as the landscape does not deny access to the box.

Turn to the next page

Overhead lines and poles (inset) would be replaced by access boxes located on property lines (shown at right).

Utility Undergrounding

Q: Why go to all this trouble?

A: First and foremost is reliability. Our above ground electric system is 50 years old and has been depreciated to $104,000 on FPL's books.

Second, there is broad consensus that hurricane wind damage to below ground systems is much less than above ground systems. Flood surge recovery has less consensus. That is why this project includes waterproof switch gear boxes. The transformers on the ground are relatively easy to replace compared to replacing a pole particularly if that pole is in a backyard.

Q: Have there been any studies by independent groups on the speed of recovery issue or the cost effectiveness of these underground projects?

A: There have been a number of studies and all reach different conclusions. These studies are available on the Town website and you are invited to draw your own conclusions.

Q: What will this project cost?

A: The project will cost $8.2 million including FPL, Atlantic Broadband and AT&T. Negotiations are underway with the cable and telephone providers to lower their costs. FPL has reduced its costs by 25 percent due to the "hardening" of their system as required by Florida law and the Public Service Commission.

Q: How will the Town pay for this?

A: Depending on the cost reductions available from the cable and telephone companies, the cost will be funded with a $12 per month surcharge on electric bills for residents and a $20 - $50 per month surcharge for commercial businesses if the debt is paid off in 15 years. If it is paid off in 20 years, the cost will be $10 per month.

Q: How many customers of FPL are there in Surfside?

A: There are 3501 residential customers and 230 commercial customers. They will all share in the cost.

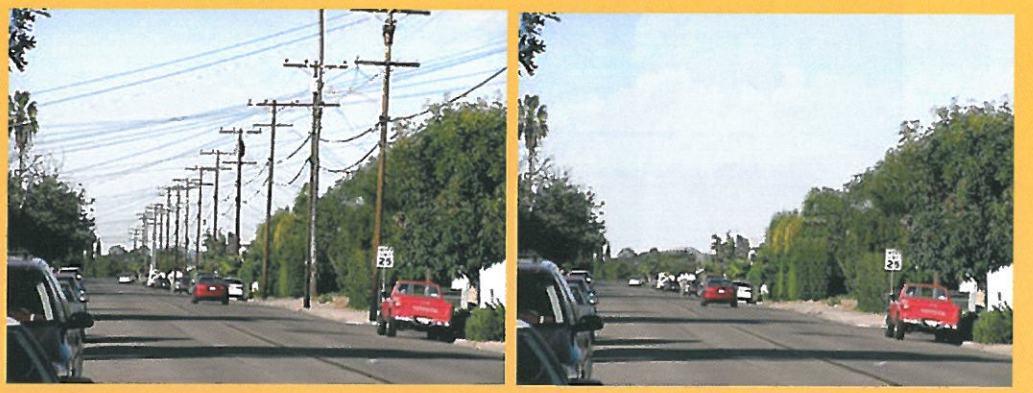
Q: Is it fair that folks who are already underground should help pay for this project?

A: Yes. The underground areas today were not paid for by the builders of the projects along Harding and Collins Avenues so the underground cost was not included in the price of the original units. These undergrounding costs were funded by the FDOT when Collins and Harding Avenues were upgraded so everyone's gas taxes paid the cost including non Surfside residents. Further, we are a community where everyone will benefit by the aesthetic and reliability benefits and our downtown will be much improved.

Q: Will my property value increase when the project is complete?

A: Most likely, however, property values are governed by many complex factors including investment in the property itself and the market factors for real estate in general.

A digitally altered photograph (right) shows a streetscape after undergrounding of utilities. The conversion would result in the removal of poles and overhead wires.



Q: Okay, enough with the big picture. What will be in front of my house?

A: A six square foot transformer box painted green, located to the best of our ability on property lines of every third home. You may also have a small telephone or cable box, however, these appear much less frequently then the transformer boxes.

Q: You just replaced a portion of my driveway for the water/sewer/storm drainage project. Here we go again.

A: We understand. We will bore under your driveway and it will not need to be replaced.

Q: What about the street, you just repaved it?

A: The Town spent $300,000 to install the conduits in any location where the former above ground wires cross the street. FPL provided the conduit at no cost to the Town. The undergrounding project will not need to break the new asphalt.

Q: Will my yard have to be dug up again?

A: Yes. The wires that go to your house above ground will come in below ground. Just as we did with the water service, there will be an individual plan to bring the wires on your property. We will work with every property owner to minimize the impact.

Q: That sounds expensive. Do I have to pay?

A: Just like the water service, the project absorbs that cost from the easement to your house.

Q: My house is very old. Will I have to pay to upgrade my wiring and my panel?

A: Possibly. There are approximately 100 homes in Surfside with very old electric service which does not meet current codes. We will work closely with every home in this condition to minimize the cost to improve safety related issues and you will have better service as a result.

Q: Wait a minute, I am on a fixed income and can't afford the monthly cost plus the upgrade.

A: There will be a program where truly fixed income people without assets will have the upgrade funded by the Town with the loan to be repaid when you sell the house.

Q: We just suffered through a year of water/sewer/storm drainage construction. Here we go again.

A: We feel your pain. The construction for the underground project will not start for at least a year. It also goes quickly since the new wires go in the 5 foot easement the Town controls and the entire road does not have to be replaced. The Town will be divided into three areas which will require 4-6 months each. We will start on the South side again.

Q: Do you energize one home at a time with the new system? Will I have a break in service?

A: No. An entire group of homes must be energized with the new system and then the poles can be removed. Every home or business in a defined area must be connected before the area is converted. Not one home or business will be left out and the downtime is very brief and you will be notified well in advance.

Continued on the back page

FOR MORE INFORMATION:
www.townofsurfsidefl.gov

An advantage of undergrounding utilites is evident after a hurricane or powerful wind event.

9293 Harding Avenue
Surfside, Florida 33154

Frequently Asked Questions on utility undergrounding

IMPORTANT INFORMATION REGARDING THE COST OF UNDERGOUNDING YOUR UTILITIES

...Continued from the previous page

Q: Times are tough and this is not a necessity. Why not wait?

A: There are a number of reasons to move forward. The first is that we have a time limit of the end of March, 2013 to decide. This time limit is established by the laws and policies which govern FPL undergrounding programs. Second, the cost of construction is about as low as it will get. The building industry is starting to recover and interest costs are very low. The loan necessary for this project is projected to carry a 3 percent interest rate.

Q: Will we lose any money if the project does not move forward?

A: We spent $58,000 for the FPL study. That will be lost. There is also $300,000 worth of conduit in the ground that could be used if the project is done in the future.

Q: Okay, you convinced me that this is a good thing. Is there any other way to pay for it?

A: Yes. A voted assessment district which requires a 50 percent plus one majority. The assessment would go on your tax bill.

Q: What if I am opposed to the project? How do I express that opposition?

A: Come to any or all of the three remaining televised public meetings and express your opinion. You will also have an opportunity to express your opinion in the final decision making discussion at the February 12, 2013 and March 12, 2013 Town Commission meetings. This is and will continue to be a very open process and your input is welcome and encouraged.

Q: What happens if I can't come to the meetings? How can I get answers?

A: Email the Town Manager at rcarlton@townofsurfside fl.gov, use our new website or call the Town Manager at (305) 993-1052. You will get a reply.

Q: One final question. Can I get AT&T U-verse if this project occurs and will the Town Commission meetings be broadcast?

A: We are working on that with AT&T and the answer looks good.

TOWN OF SURFSIDE
MEMORANDUM

DATE: February 12, 2013

TO: Mayor Daniel Dietch and Members of the Town Commission

FROM: Roger M. Carlton, Town Manager

SUBJECT: Status Report Regarding Town Manager Recruitment Process

Pursuant to the direction given during the December 11, 2012 Town Commission meeting, the selections of the Members include:

Daniel Dietch
- Steve Alexander
- Michael Crotty
- Steven Crowell, Jr.
- Hector Mirabile
- O. Paul Shew
- Christopher Rose

Marta Olchyk
- Steve Alexander
- Ana Garcia
- John Taxis
- James Gleason
- Hector Mirabile

Joe Graubart
- Did not submit a list of candidates.

Michael Karukin
- Anthony Carson
- Michael Crotty
- Ana Garcia
- Calvin Peck
- Christopher Rose
- John Taxis

Michelle Kligman
- Steve Alexander
- Ana Garcia
- Christopher Rose
- John Taxis
- Roger Hernstadt*

*Note: Roger Hernstadt is currently the Manager of Marathon and he did not submit an application as part of the process. His resume is attached and the same background check as the rest of the listed candidates will be completed before the Town Commission meeting.

Analyzing the Town Commission submitted names results in the following:

Steve Alexander	3 votes
Ana Garcia	3 votes
Christopher Rose	3 votes
John Taxis	3 votes
Michael Crotty	2 votes
Hector Mirabile	2 votes
Anthony Carson	1 vote
Steven Crowell	1 vote
James Gleason	1 vote
Calvin Peck, Jr.	1 vote
O. Paul Shew	1 vote
Kristina Gulick	0 votes
Brently Mims	withdrew
Roger Hernstadt	added by Michelle Kligman

The Town Commission should determine if it wants to set a cut-off at 2 votes which will allow the round robin interviews on February 26, 2013 and possibly rank the candidates at the end of the process.

Roger M. Carlton
Town Manager

Yamileth Slate-McCloud
Human Resources Director

Att

Roger T. Hernstadt
4 Ibis Lane
Miami, FL 33050
(305) 297-3000
fla_mariner@msn.com

Personal Philosophy – "Good enough never is!"

EXPERIENCE:

City Manager
City of Marathon, Florida
February 2010 to present

I was selected as City Manager after considering 98 other applicants including locals and current employees. In my first year as City Manager, all five members of the City Council gave me an outstanding rating and an 18% raise. I was also given another 11.5% raise in February 2012. Fiscal year 2012 budget is $93 million in total and the $10.8 million general fund is based on a millage rate of 2.1989 ($550 municipal property tax/$250,000 net assessed value). Fund balance for general fund equates to four months of operating costs. In 2012, Marathon received a $5M commercial redevelopment grant from the State of Florida. Since February 2010, the City received in excess of $8 million from the America Recovery and Reinvestment Act of 2009 for eligible infrastructure projects. $125 million wastewater, storm water and road resurfacing project was completed on schedule in December 2012. Negotiated a new inter local to provide fire rescue services for a sister city increasing associated net revenue paid to by Marathon's by 20%. Settled a $3 million lawsuit at zero cost to the City and resolved other potential lawsuits due to the actions of prior City Managers. Updated all Department Directors' job descriptions and set quantifiable goals to be achieved in the each fiscal year. I established a short and long-range capital plan and a renewal and replacement schedule for City assets. Also I negotiated new City health insurance program at a less than a 5% increase for FY 2012. Also I negotiated new fire rescue labor contract in 2012 that caps the City's pension contribution at 15% (reduced from 42%).

Assistant City Manager/Chief of Staff, Office of the City Manager
City of Miami, Florida
August 2007 to September 2009

Portfolio included Budget, Procurement, General Services, Solid Waste, Code Enforcement and Neighborhood Services. Previously, I supervised Public Works, Parks and Capital Improvements. I was a team member on the successful Oracle ERP Employee Relations implementation project and associated change management activities. Successfully obtained elected official approval for two budgets in excess of $500 million (4:1 and 5:0 votes) for required 10% millage growth following enactment of House Bill 1B (limits roll growth), voter approved Amendment 1 (third $25K exemption) and Senate Bill 1588 (disallowed effects of Amendment 1 to millage adjustment to achieve rollback) while maintaining a $100 million fund balance, no layoffs of filled positions and enhance public safety and recreational staffing. Obtained an 11% increase in solid waste fees to implement waste truck and equipment replacement program. Developed and implemented fleet replacement strategies, estimating methodologies and schedules. Initiated competitive costing reviews and established activity based cost centers and objective performance indicators. Authored Certified Small Business legislation collaborated on "Green Procurement" initiatives and wrote legislation to streamline code enforcement hearings and enhance fine collection. Negotiated with the County and three museums on behalf of the City and drafted the $400 million Museum Park project memorandum of understanding, the subsequent lease, development agreement and environmental remediation

agreement as well as the City's pari-mutual facilities agreements. Managed the command post and coordinated all City staff functions for the 2008 US Conference of Mayors in Miami, Florida.

Director, Office of Capital Improvements, County Manager's Office
Miami-Dade County, Florida
2005 to 2007

Planned, developed referendum strategy and implemented the Building Better Communities Bond Program and coordinated other Miami Dade County capital improvement projects. The $2.9 billion bond program included more than 300 capital projects to be completed over a 15-year period, being one of the most ambitious capital improvement programs in the nation. I led the team that obtained support in excess of 60% for all 8-ballot questions. One year after the initial $263 million of bonds were sold, $180 million of capacity was either under contract or spent. Other responsibilities included the facilitation and coordination of the County's entire capital improvements program in accordance with State Statutes 255 and 287, including the development of the centralized capital information and process computer system and the standardization of construction contract language and forms. Responsible for contracting new projects and facility renovation (almost 60 projects totaling almost $145 million) plus the associated architectural and engineering selection process (25 projects), coordination and administration of the open competitive architectural and engineering pool for small projects (more than 150 projects valued at $8 million). In addition, I was responsible for more than 973 small (valued at less than $1 million each) construction projects totaling $65 million. I negotiated project worksheets for Hurricane Katrina and Wilma in 2005. Obtained more than $500 million in federal disaster recovery and grant funding for public infrastructure and administered the implementation of the associated projects.

Capital Improvement Coordinator, County Manager's Office
Miami-Dade County, Florida
1999 to 2005

Facilitated and monitored performance of departments to ensure that capital improvement projects were completed timely and on budget as well as achieved the policy objectives established by the Elected Officials and County Manager. Planned, designed, implemented and trained users on a custom, comprehensive capital improvement software and project management system. Expedited completion and implementation of more than $399 million in high priority infrastructure improvements funded by general obligation and other bond proceeds; implemented and monitored projects funded through the Quality Neighborhoods Improvement Program, Safe Neighborhood Parks Bond Program, Storm water Utility and Impact Fees projects including design and construction contracts in excess of $300 million. Miami-Dade County's designated FEMA Coordinator responsible for handling public assistance claims.

Assistant Director - Finance, Budget, Personnel, Information Technology and Services
Public Works Department - Miami-Dade County, Florida
1995 to 1999

Planned, organized implemented and directed financial, project management, informational technology operations and personnel management (700 employees). Oversaw expenditure control and fiscal strategic planning, purchasing, contracting for operational budget ($64 million), capital projects ($36 million), special taxing districts ($14 million). I created implemented and trained users on a custom, comprehensive service request and departmental operations management software. I was responsible for preparing annual Transportation Improvement Plan for submission to Metropolitan Planning Organization. Following a scandal was out stationed to the Water and Sewer Department to retool design, engineering and construction policies and work methodologies.

Negotiated and settled disputes with the Federal government resulting in $51.0 million of reimbursement to the County.

Chief of Services and Administration, Public Works Department
Miami-Dade County, Florida
1987 to 1995

Implement departmental service objectives and policies for finance, information technology, computerized revenue collection systems, code enforcement and neighborhood services. Coordinated all departmental operations for capital budgeting and project scheduling, fleet management and inventory.

Chief of Causeways and Special Taxing Districts, Public Works Department
Miami-Dade County, Florida
1987

Planned, directed and coordinated the implementation of new service and capital improvement special taxing districts, managed exiting special taxing districts and operated the County's toll facilities. Responsibilities included fiscal management, revenue analysis, cash management, budget preparation and special assessment calculations. Developed capital and operating budgets, contractual services specifications, contracts and managed performance. Oversaw special revenue funds and insured trust agreement compliance. Served as spokesperson and facilitated public hearings on controversial items.

Code Compliance Manager, Public Works Department
Miami-Dade County, Florida
1980 to 1987

Responsible for department-wide service request processing and responsiveness, code enforcement activities and fine collections. First responder and lead public contact on neighborhood disputes involving all segments of the community. Determined property ownership from real estate records and maps, supervised twenty-three employees, prepared and controlled Office's operational and capital budgets, developed service proposals and contracted for services, and issued contractor payments, fines and lien revenues and performed special investigations.

EDUCATION:

Master's Degree, Administration, University of Miami
Bachelor of Science, Brooklyn College
Most Recent Seminar: Harvard University – John F. Kennedy School of Government
Executive Education – Driving Government Performance

ACHIEVEMENTS:

2008 – Florida Engineering Society – Miami Chapter: Outstanding Service to the Profession of Government
2007 – National Association of Counties Award
2006 – National Association of Counties Award
2005 – American Society of Public Administrators: South Florida Public Administrator of the Year
2005 – Miami Today Newspaper "Newsmaker"
2005, 2000 & 1996 – National Association of Counties Award

REFERENCES:

Available upon request.