



London Economics International LLC

**Commission's Review of Delmarva Power's Retail
Electricity Pricing and Potential Long-Term
Approaches to Secure Lower Priced Energy
*Docket 14-0283***

Final Report & Recommendations

**Prepared for the July 21st, 2016 stakeholder workshop
Dover, Delaware**

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Disclaimer

- ▶ **London Economics International LLC (“LEI”) was engaged by the Staff of the Delaware Public Service Commission to review alternative electricity procurement processes for the provision of Delmarva Power’s Standard Offer Service. As part of this exercise, LEI performed a quantitative analysis of RSCI SOS supply costs and variability of supply costs under various procurement methods and market conditions**

- ▶ **While LEI has taken all reasonable care to ensure that its analysis is complete, power markets are highly dynamic, and thus certain recent developments may or may not be included in LEI’s analysis. Regulators, stakeholders and others should note that:**
 - LEI’s analysis is not intended to be a complete and exhaustive analysis of all possible outcomes. All possible factors of importance to a stakeholder have not necessarily been considered. The provision of an analysis by LEI does not obviate the need for stakeholders to make further appropriate inquiries as to the accuracy of the information included therein, and to undertake their own analysis and due diligence
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 - There can be substantial variation between assumptions and market outcomes analyzed by various consulting organizations specializing in competitive power markets and investments in such markets. LEI does not make any representation or warranty as to the consistency of LEI’s analysis with that of other parties

Agenda

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Introduction

2

DPL's Standard Offer Service supply procurement

3

Analysis of alternative procurement methods - Methodology

4

Analysis of alternative procurement methods - Findings

LEI was retained by the staff of the Delaware PSC to undertake a review of Delmarva's RSCI SOS supply procurement approach

- ▶ **London Economics International (“LEI”) was retained by the staff of the Delaware Public Service Commission to undertake a review of Delmarva Power and Light Company’s (“Delmarva” or “DPL”)s) current Standard Offer Service (“SOS”) supply procurement approach, focusing on Residential and Small Commercial & Industrial (“RSCI”) customers**
- ▶ **LEI’s first report included a review of SOS (or equivalent) procurement processes in comparable jurisdictions, and discussed the characteristics of various electricity supply procurement methods**
- ▶ **LEI further sought input from stakeholders through a technical conference in September 2015 and subsequent comment period**
- ▶ **In May 2016, LEI submitted its “Final Report and Recommendations” report which was filed in Docket 14-0283**

Today’s presentation summarizes the analysis, discussion, and findings for potential alternative SOS supply procurement options

Agenda

- 1 Introduction
- 2 DPL's Standard Offer Service supply procurement**
- 3 Analysis of alternative procurement methods - Methodology
- 4 Analysis of alternative procurement methods - Findings

Subject to PSC approval, legislation grants DPL significant flexibility in selecting the method for procuring supply for its SOS customers

In order to meet its electric supply requirements, the legislation offers the SOS provider flexibility, subject to the approval of the Commission, to:

- 1 Enter into short- and long-term contracts for the procurement of power necessary to serve their customers
- 2 Own and operate facilities for the generation of electric power
- 3 Build generation and transmission facilities (subject to any other requirement in sections of the Delaware Code regarding siting and other issues)
- 4 Make investment in demand-side resources
- 5 Take any other Commission-approved actions to diversify its retail load

Currently, DPL relies on a competitive process and laddered 3-year contracts to procure supply for its RSCI SOS customers

DPL uses a competitive process to procure the full requirements of eligible customers

RSCI customers SOS supply procurement process

Procurement objectives	<ul style="list-style-type: none"> • Supply reliability • Price stability • Least cost to consumers
Annual process	One third of RSCI SOS load is offered annually
Contract term	3 year contracts
Product	Full Requirements Service (“FRS”)

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LEI reviewed four different options for procurement strategies, which are consistent with statute and could be used in combination with one another

**Direct procurement from
the PJM spot markets**

Long-term contracts

**Own generation
(build/buy)**

**Procurement of FRS from
third-parties (Status Quo)**

Combination of procurement methods

LEI relied on a combination of quantitative and qualitative factors to assess each procurement option

For each individual procurement option, LEI assessed the following quantitative and qualitative factors:

Supply Cost	Average cost of supply (nominal \$/MWh) over reference period
Supply Cost Variability	Standard deviation of year-over-year changes in supply costs (\$/MWh) over reference period
Administrative Cost	Estimated administrative cost associated with implementing a supply procurement method
Other Considerations	Qualitative considerations such as ease of implementation, consistency with Delaware policies & goals, consistency with wholesale markets, and regulatory/legal considerations

Four evaluation criteria selected to perform an objective analysis of SOS supply procurement mechanisms based on feedback from stakeholders

Set of four evaluation criteria used to assess current SOS procurement methodology with respect to alternative approaches

Efficiency and consistency with competitive markets

Balancing benefits and costs to ensure the least cost to consumers

Consistency with overall Delaware policies and goals

Ease of implementation

LEI assessed the various procurement strategies under several scenarios for electricity prices or RSCI SOS load

LEI used five distinct scenarios for the analysis of RSCI SOS supply procurement methods

Historical analysis

Historical

Historical prices, encompassing the 2007-08 to 2014-15 delivery periods

Forward-looking analysis

Base Case

Base Case weather-normalized outlook for energy and capacity over 2016-2025 period

Low Price

Low Price weather-normalized outlook for energy and capacity over 2016-2025 period

Price Shock

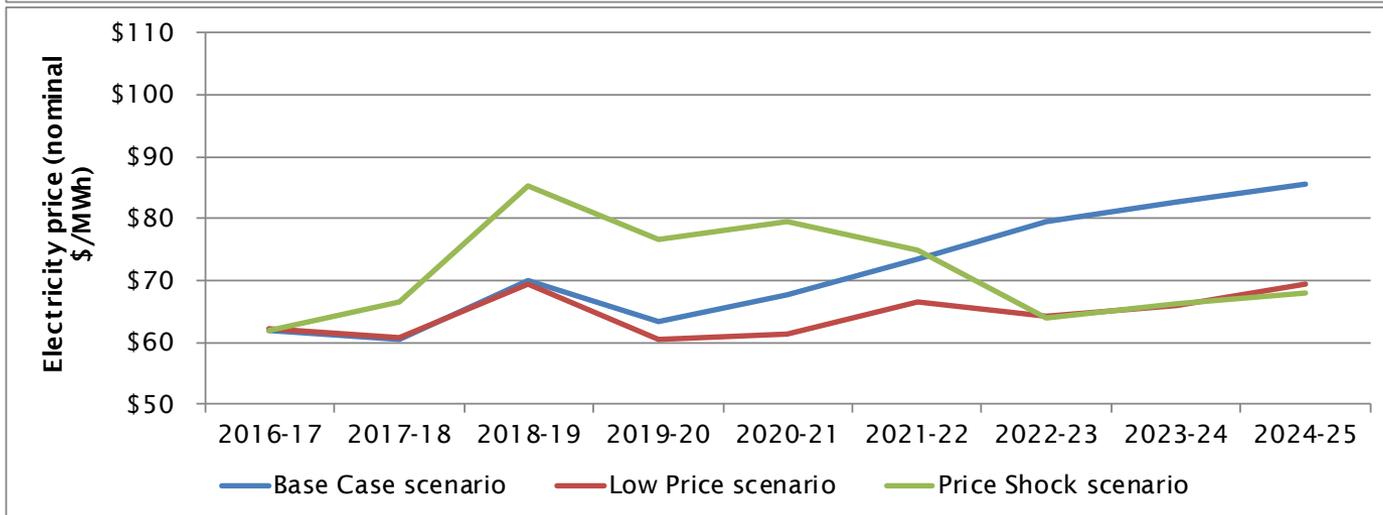
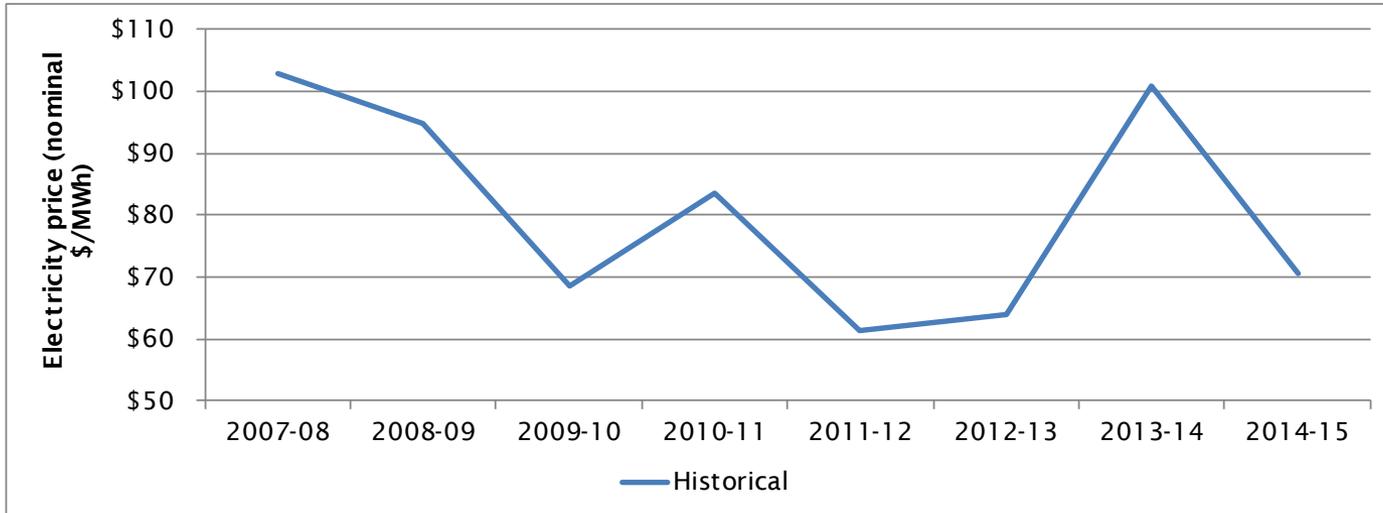
Hypothetical scenario over 2016-2025 period featuring sharply increasing, then declining, electricity prices

High Migration

Hypothetical scenario featuring a high RSCI SOS customers migration rate, leading to lower load than forecast in 2014 IRP

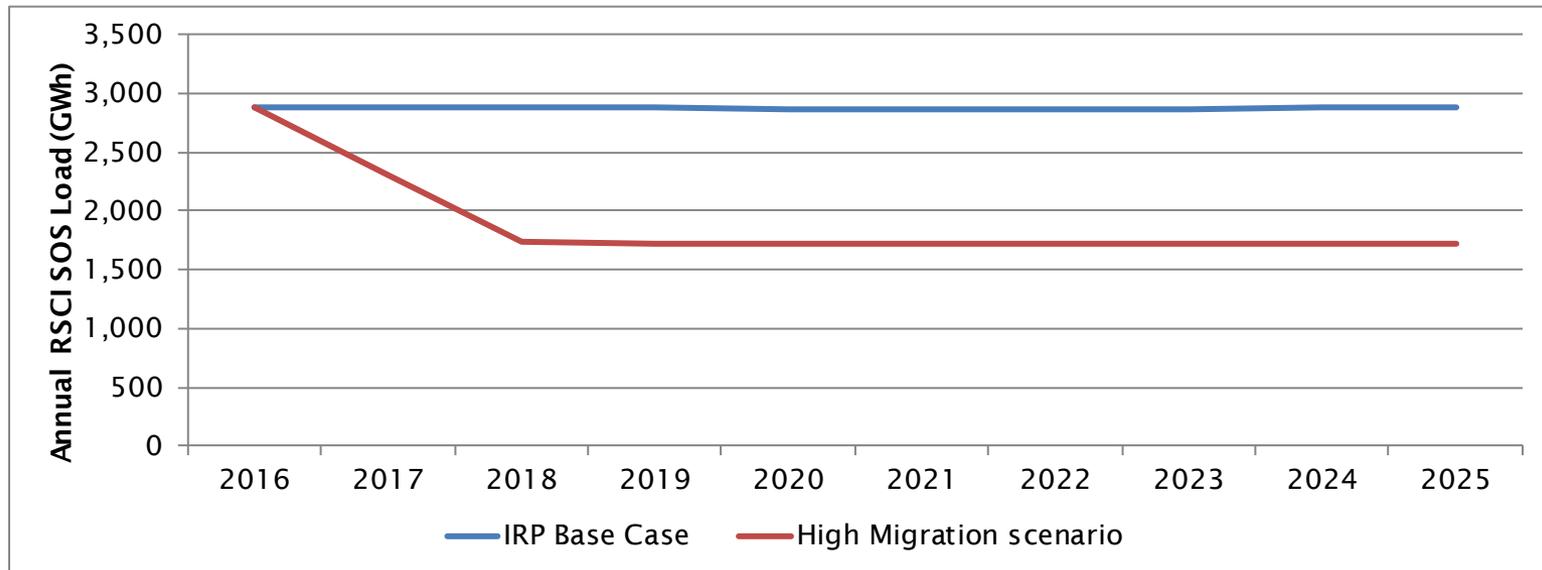
Historical prices are higher than forward-looking outlooks, and display variability associated with weather and unplanned events

Load-weighted electricity price under various scenarios (includes energy, capacity, ancillary services, and other ISO fees)



High Migration scenario designed to showcase the effect of a significant decline in RSCI SOS customer load, for instance through a larger than expected migration rate

RSCI SOS load forecast for Base Case and High Migration scenarios



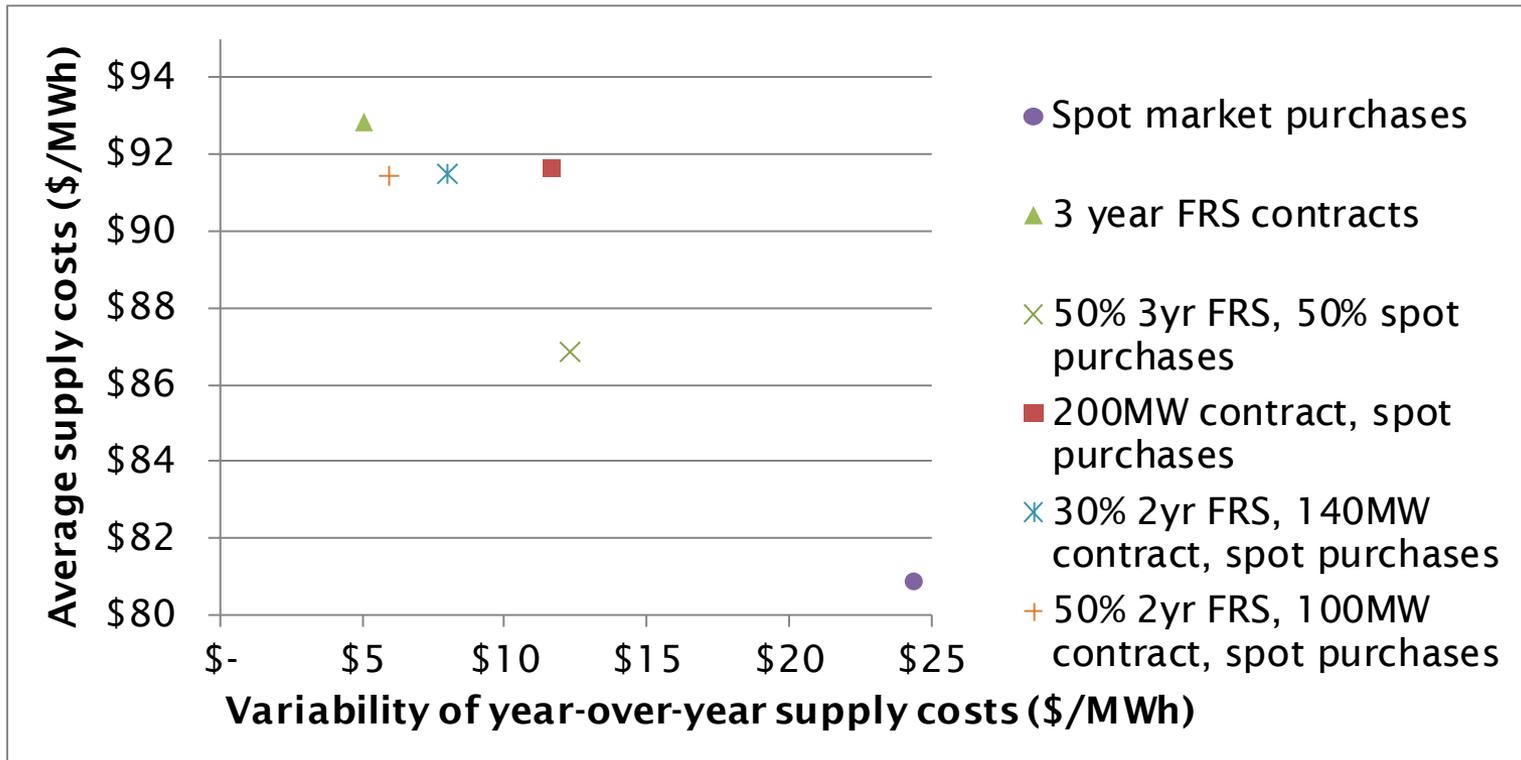
Hypothetical High Migration rate scenario assumes a decline of 40% in load over two years with respect to the 2014 IRP RSCI SOS outlook

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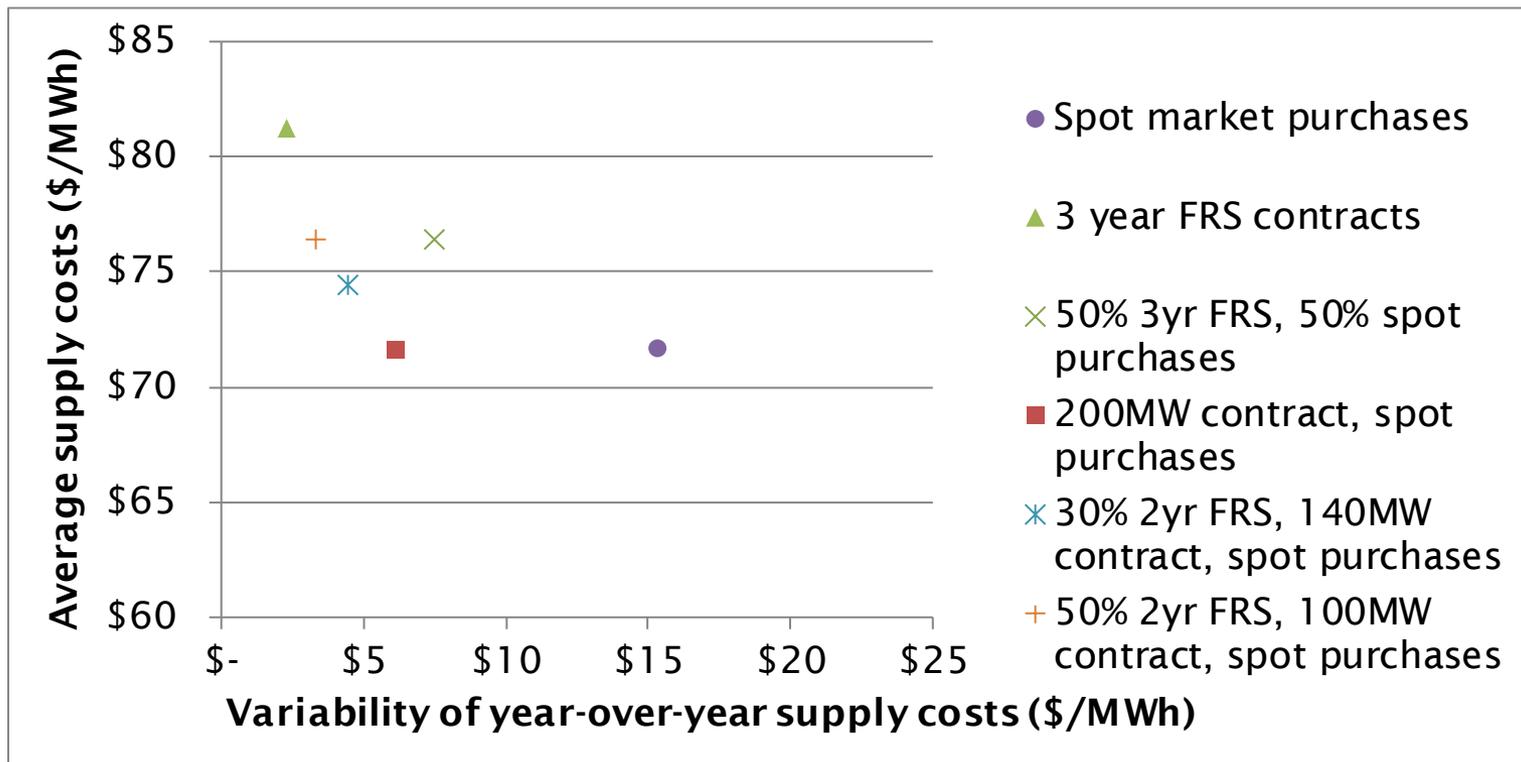
Historical scenario analysis illustrates decline in wholesale market prices not fully captured by long-term and FRS contracts

Cost vs. Variability comparison for various procurement options Historical scenario



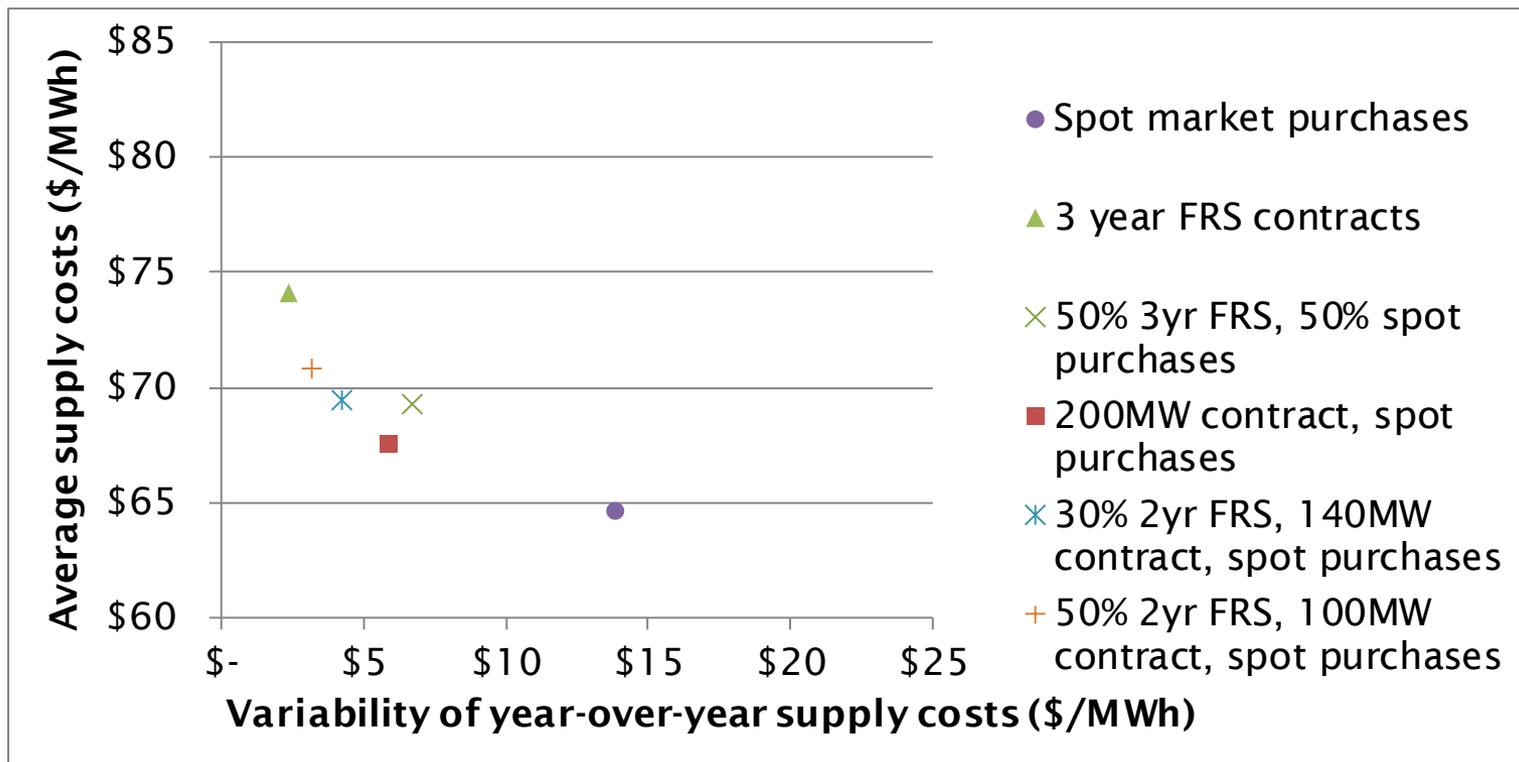
Base Case scenario illustrates price stability advantage of long-term contracts, while lowering supply costs with respect to FRS procurement

Cost vs. Variability comparison for various procurement options Base Case scenario



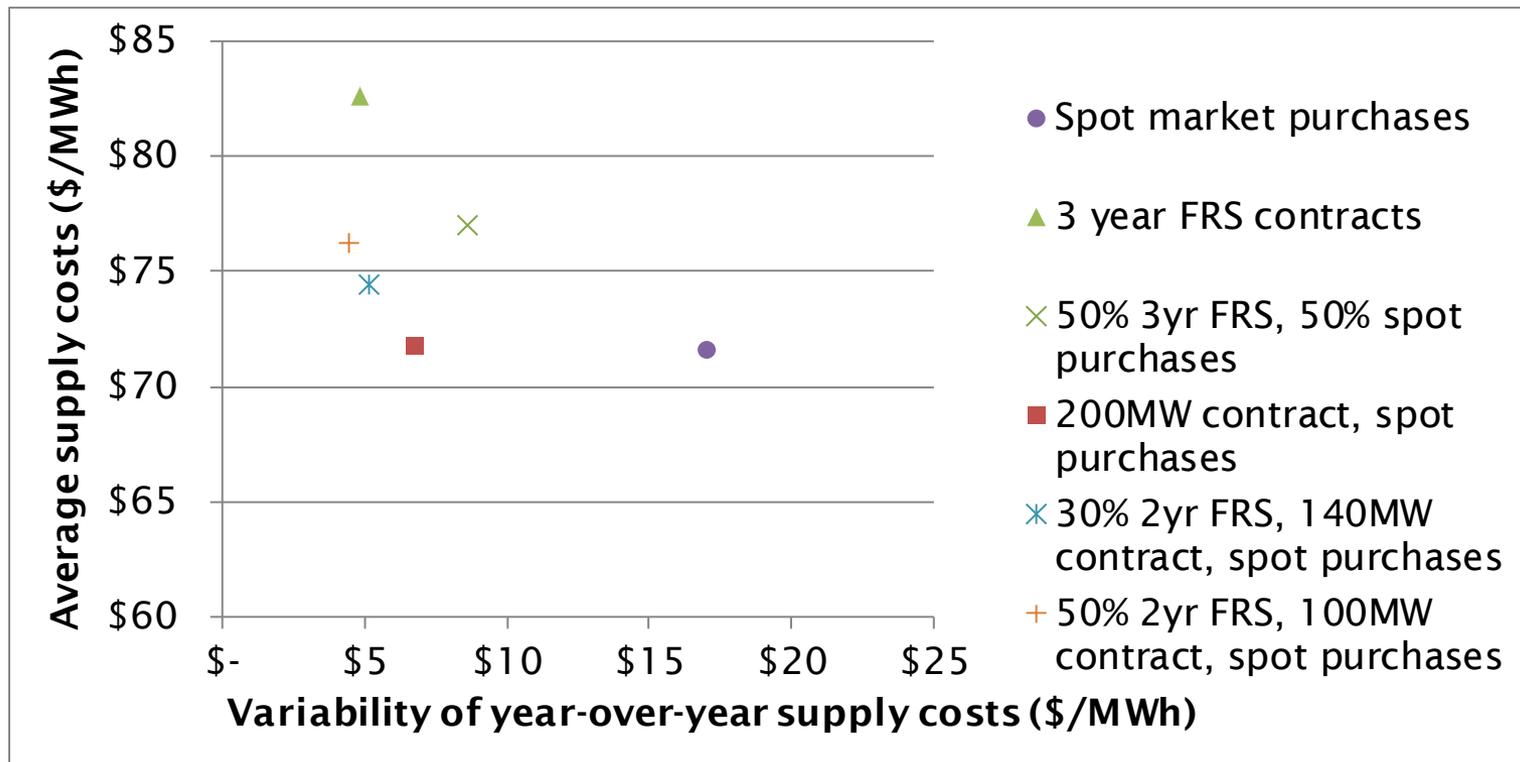
In Low Price scenario, supply cost savings from portfolio procurement are not as high as in Base Case

Cost vs. Variability comparison for various procurement options Low Price scenario



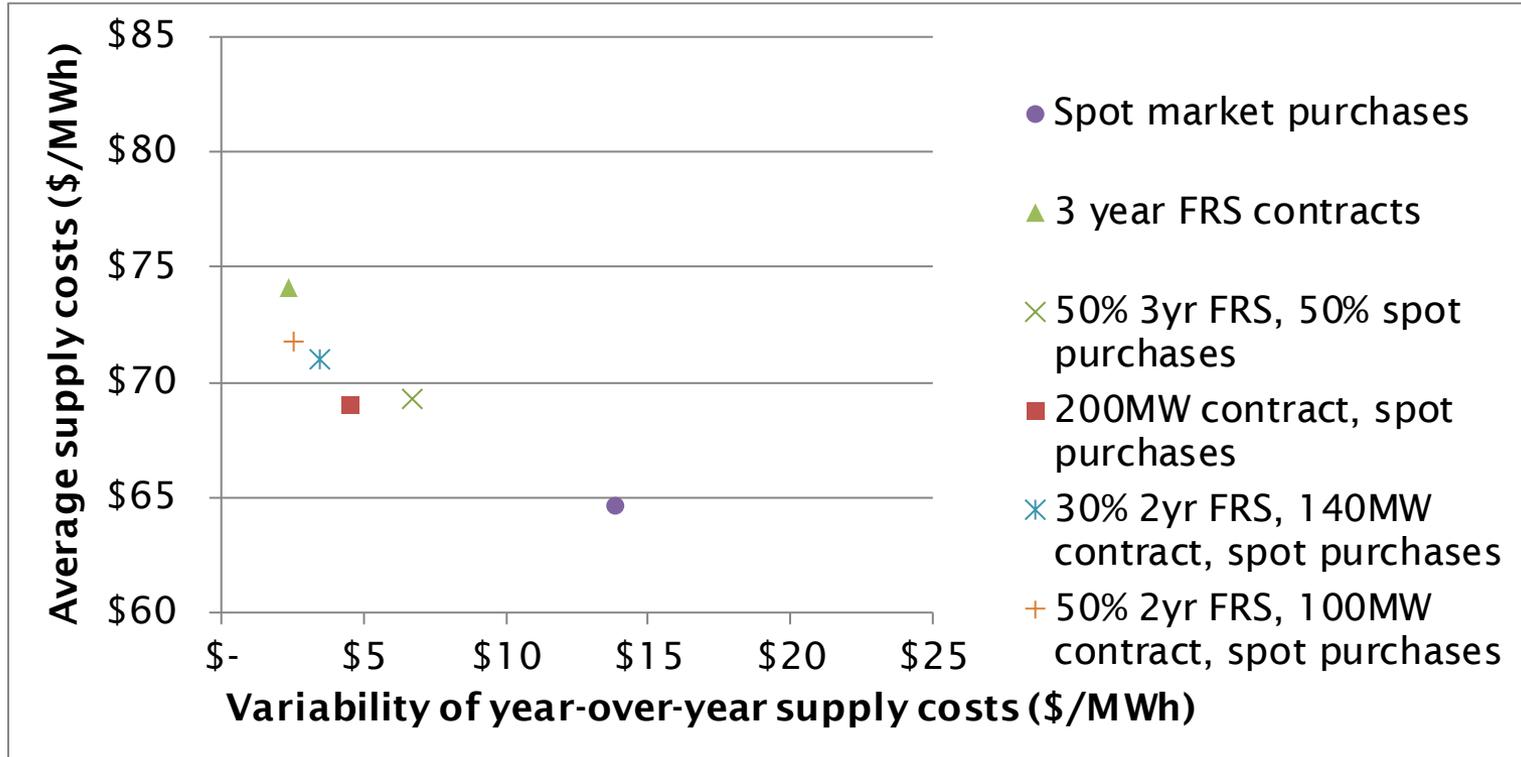
In price shock scenario, long-term contracts provide price stability with respect to other procurement methods

Cost vs. Variability comparison for various procurement options Price Shock scenario



In High-Migration, Low Price scenario, long-term contracts represent a greater proportion of SOS load while not fully capturing decline in wholesale prices, but still represent a discount to FRS procurement

**Cost vs. Variability comparison for various procurement options
High Migration, Low Price scenario**



Spot market purchases is consistently among least costly, most variable supply sources, while FRS procurement is the more costly, less variable option

Decline in average cost of supply for each \$1/MWh increase in variability with respect to procurement of three year FRS contracts

All values in \$/MWh	Historical scenario	Base Case scenario	Low Price scenario	Price Shock scenario	High Migration, Low Price
Spot market purchases	(\$0.6)	(\$0.7)	(\$0.8)	(\$0.9)	(\$0.8)
3 year FRS contracts	N/A	N/A	N/A	N/A	N/A
50% 3yr FRS, 50% spot purchases	(\$0.8)	(\$0.9)	(\$1.1)	(\$1.5)	(\$1.1)
200 MW contract, spot purchases	(\$0.2)	(\$2.5)	(\$1.9)	(\$5.5)	(\$2.4)
30% 2yr FRS, 140 MW contract, spot purchases	(\$0.5)	(\$3.2)	(\$2.5)	(\$30.2)	(\$2.9)
50% 2yr FRS, 100 MW contract, spot purchases	(\$1.7)	(\$4.7)	(\$4.3)	N/A	(\$13.7)

These quantitative results support recommendation of a portfolio approach in order to leverage the benefits of diversification

Spot market purchases directly reflect wholesale costs of electricity, but also reflect high variability of wholesale electricity markets

SOS Supply can be purchased directly from the wholesale markets

Supply Cost

- Supply cost directly reflects underlying cost of electricity in wholesale markets, without any intermediary

Supply Cost Variability

- High variability of supply costs, fully reflecting price variations associated with changes in fundamental market drivers, weather events, outages, or regulatory changes

Administrative Cost

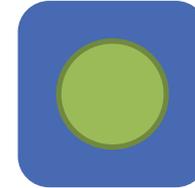
- Requires energy market scheduling capabilities and other administrative duties of participating in PJM markets, or subcontracting third-party who would act as PJM market participant

Other Considerations

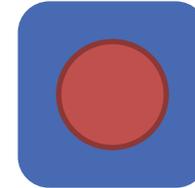
- Electricity supply price risk is entirely borne by SOS customers
- No risk associated with RSCI SOS load level variations, as exact supply requirement can be purchased from wholesale markets

Purchases from spot market are transparent and potentially lower cost than other options, but high variability of costs not consistent with desire for stable supply costs

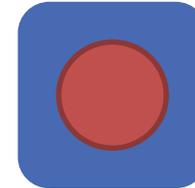
Efficiency and consistency with competitive markets



Balancing benefits and costs



Consistency with overall Delaware policies and goals



Ease of implementation



Because of large variability of costs, purchases from the spot market should not be the primary means of procuring supply for the RSCI SOS load

Full Requirements Service ensures stability of supply costs, at the expense of a risk premium embedded in supplier's offers

FRS is a fixed price, load-following bundled product which includes energy, capacity, ancillary services and other ISO fees

Supply Cost

- Supply cost fixed for term of FRS contract, however suppliers typically include risk premium in their offers to cover market price & load variation risks
- Fixed-price multi annual contracts might cause a discrepancy between supply costs and underlying wholesale market prices

Supply Cost Variability

- Multi-year FRS contracts, together with laddering of contracts, reduce considerably variability of supply costs for consumers when compared to underlying wholesale market prices

Administrative Cost

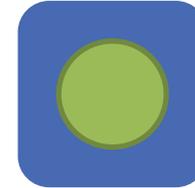
- Since FRS suppliers assume the Load Serving Entity obligations, SOS provider administrative requirements are limited to running procurement auctions and managing resulting contracts

Other Considerations

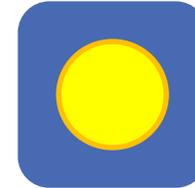
- Parameters of FRS procurement (amount of load up for auction, block size, contract term, auction timing, or type of auction) can affect supply cost, supply cost variability, supplier participation

Simply changing parameters of FRS procurement would not result in significantly lower supply costs over the longer term

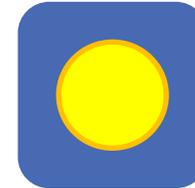
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Ease of implementation



In order to significantly lower supply costs over the longer term, another procurement method, possibly in combination with FRS procurement, needs to be adopted

Long-term contracts secure a specific amount of supply at a known price to ensure stability of costs over the contract horizon

Long-term contracts procure fixed quantities of energy and/or capacity at a known price over the contract term

Supply Cost

- Contractual price should be consistent with market expectations over contract horizon at the time contract is signed
- Contractual price is not indexed to spot market prices, potentially leading to a divergence between supply costs and underlying wholesale market prices

Supply Cost Variability

- As contractual price modestly but steadily increases throughout the length of the contract, this supply procurement method does not exhibit any variability

Administrative Cost

- Administrative requirements associated with procuring and managing long-term contracts should not be materially different from managing existing FRS or REC contracts

Other Considerations

- Fixed-quantity nature of contracts lead to need of complementary supply procurement method to provide load-following service
- Contracts must be sized such that they do not lead to increased exposure to spot market prices in case of lower load levels

Long-term contracts emphasize price stability to the detriment of consistency with the current market conditions, with load variation risks borne by the SOS consumers

Efficiency and consistency with competitive markets



Balancing benefits and costs



Consistency with overall Delaware policies and goals



Ease of implementation



Fixed-quantity nature of contracts, as well as possible divergence from market conditions and risk associated with load variation, would preclude long-term contracts from being optimal as a primary means of procuring supply for SOS customers

Building/Owning own generation resources could lead to increased cost, legal or regulatory risks

Several factors make building/owning generation option unattractive for SOS provider

- The minimum practical size for a CCGT is larger than average RSCO SOS load
- Intermittent generation could increase exposure to spot markets, lead to energy markets congestion risk if resource located outside DPL zone
- Oversight of the plant's operations would require additional resources from the SOS provider
- Legislative or regulatory concerns may arise when building/owning generation resources as a regulated entity

As such, LEI did not evaluate this option in the following analysis and ultimate recommendation for SOS supply procurement

Combining percentages of supply procured from different procurement methods allows for reducing risk associated with variability of supply cost while minimizing overall cost of supply

Procurement portfolio combines specific percentages of supply procured from different procurement methods

Supply Cost

- Risks associated with differences in year-over-year cost of supply can be mitigated through spreading the supply requirement among multiple procurement methods

Supply Cost Variability

- Procurement portfolio allows the variability of supply costs to be adjusted through the ratios of supply procured from each procurement method

Administrative Cost

- Potentially higher administrative requirements when a supply procurement portfolio is used as compared to a single procurement method

Other Considerations

- Portfolio approach can increase consistency with wholesale markets, supporting retail competition and customer choice

Analysis shows the merits of a portfolio approach, which could lower cost of supply but at the expense of slightly higher variability and administrative requirements

Efficiency and consistency with competitive markets



Balancing benefits and costs



Consistency with overall Delaware policies and goals



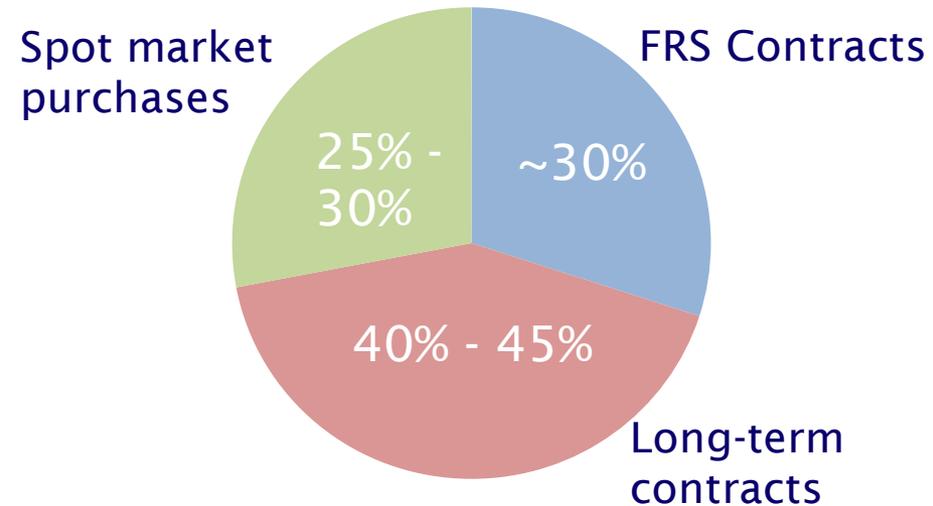
Ease of implementation



A portfolio approach would best satisfy evaluation criteria through a combination of competitive, transparent procurement methods providing for linkage of supply costs to competitive markets and balancing lower costs to consumers with risks

Portfolio procurement would balance FRS contracts, long-term contracts and spot market purchases

The proposed portfolio includes two-year laddered FRS contracts, ten-year laddered fixed quantity contracts, and purchases from the spot markets



- ▶ Majority of supply requirement procured through load-following spot market purchases and FRS contracts reduce the risk associated with load migration
- ▶ Combination of FRS procurement and spot market purchases will ensure that the price for majority of the supply follows the trends in wholesale market conditions
- ▶ Supply provided through long term contracts and FRS contracts creates price stability in the portfolio

LEI proposes a portfolio approach to balance risk and costs for consumers

- ▶ **While LEI did not consider every possible portfolio composition, the proposed approach balances reduction in costs with increased cost variability and risk tied to load variations**
 - Proposed portfolio provided for significant reduction in supply costs per \$/MWh increase in variability among options tested by LEI
- ▶ **Predetermined proportions of supply from the various procurement methods in the portfolio would allow for transparency and linkage to competitive markets, while minimizing the active portfolio management burden for the SOS provider**
- ▶ **Increased variability could also allow SOS rates to follow more closely the wholesale market prices, thus facilitating the emergence of competitive retailers**
- ▶ **Additional discussion, modeling, and testing may be necessary to refine the optimal risk-adjusted portfolio such that it provides lower expected average supply costs than historically observed, with an acceptable level of variability and price risk**

Thank you

Q&A