



NextGrid Illinois



DER VALUATION CONCEPT AND TECHNOLOGY

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FEBRUARY 28, 2018

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2/23/2018



DER ARE BENEFICIAL IN MULTIPLE WAYS AND HAVE MULTIPLE VALUES

- Societal Values
 - Environmentally positive
 - Co located with consumers
 - ...
- AND multiple mechanisms to monetize these values
 - Consumer avoided costs
 - Sales into the wholesale market
 - Societal mandates in terms of subsidies where and when applicable.
- This discussion focuses **ONLY** on the value of DER to the distribution system → to the grid

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THE UNDERLYING LOGIC OF VALUATION OF DER: THE PERSPECTIVE OF AN ENGINEERING ECONOMIST

- The positive or negative value of any asset in the distribution system TO THE DISTRIBUTION NETWORK can be shown to be the sum or combination of the attributes of the DER that are:
 - **What** product is being delivered to or consumed from the network
 - **Where** the product is being delivered or consumed
 - **When** the product is being delivered or consumed

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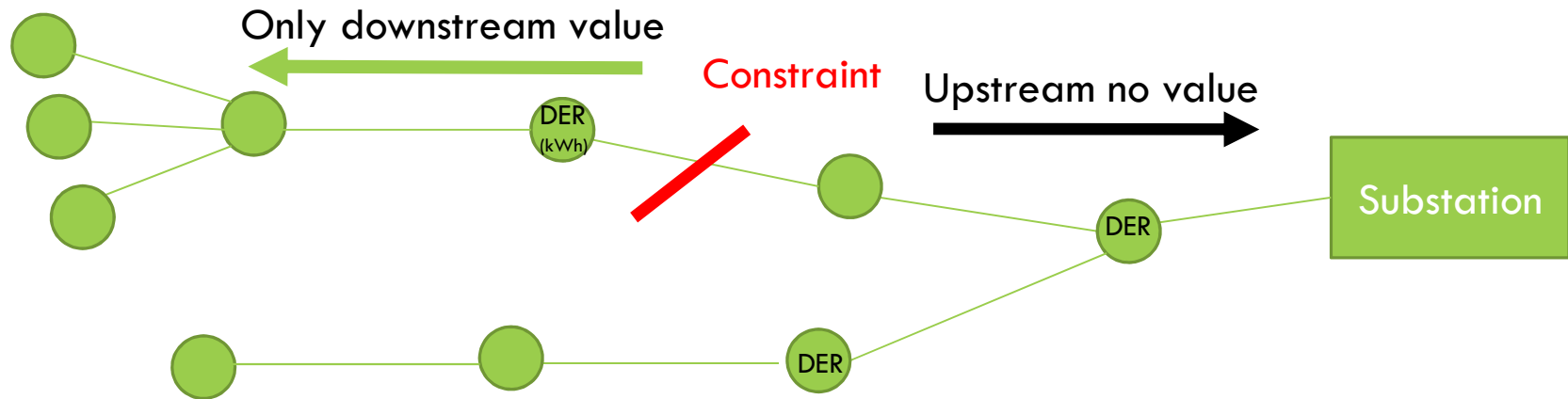
DER PRODUCTS / SERVICES TO BE VALUED

- Real Power (kWh)
- Reactive Power (kVAR)
- Reserves (Future kWh and kVAR)
- Characteristics of the products
 - Individual DER Technologies can provide one or a portfolio of products
 - HOWEVER... There are trade-offs
 - To deliver additional reactive power requires giving up some amount of real power
 - To commit to delivering reserves of kWh or kVAR in the future eliminates the possibility of delivering into the market at that same time.

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LOCATION IS CRITICAL



The value of DER to the grid cannot be calculate based on the system as a whole... The value is dependent on the location within the feeder – the marginal value at the node reflecting both upstream and downstream conditions.

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LOCATION IS CRITICAL

- Because the distribution system is radial (non-networked), **congestion** on any line segment affects the Value of **all downstream buses**
- Unlike transmission, the existence of congestion implies that load cannot be served with existing capacity.

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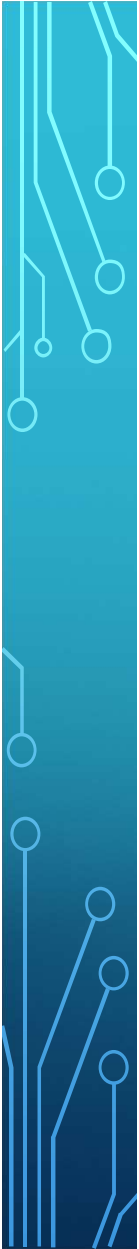


WHEN THE DER IS AVAILABLE TO MEET THE NEED IS CRITICAL

- There is no inherent value to the grid when kWh or kVARs are generated and provided to individual consumers / owners or sold into the wholesale market
- There is ONLY value to the grid when there is an actual need at a specific time for the products / services that the DER can provide.

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2/23/2018



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