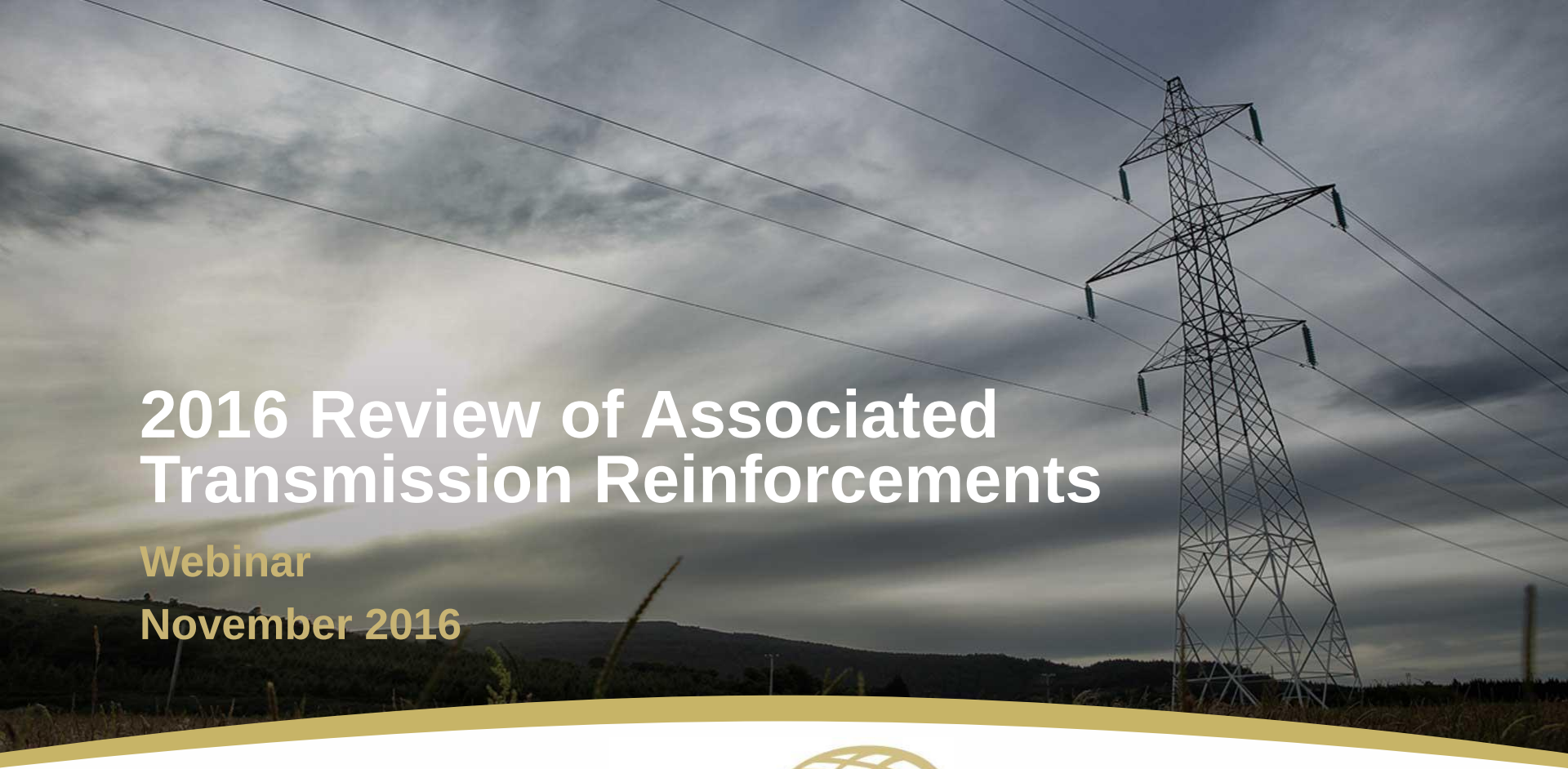

2016 Review of Associated Transmission Reinforcements

Webinar

November 2016

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Agenda

- Introduction
- Approach
- Results
- Next steps

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Introduction

- Commercially Sensitive
  - Not discussing individual results
- Caveat
  - While all reasonable care has been taken in the preparation of this data, EirGrid and SONI are not responsible for any loss that may be attributed to the use of this information. Prior to taking business decisions, interested parties are advised to seek separate and independent opinion in relation to the matters covered in this document and should not rely solely upon data and information contained herein.
  - This document does not purport to contain all the information that a prospective investor or participant in the Single Electricity Market may need.

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Introduction

- 2016 Review has been undertaken
- Purpose :
  - To review the extent to which non-firm generators contribute to constraints and drive ATRs, and
  - To recommend disassociation where they don’t drive constraints

Key Concepts

- Ref: CER decisions
- Firm Access
- Constraint and Curtailment
- Gate Processing
- Associated Transmission Reinforcements (ATRs)
- Firm Access Quantity (FAQ)

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Firm Access – original intent and purpose

- To achieve a balance between granting generators access to the network in advance of transmission reinforcements and to protect the end consumer from high constraints payments
- Generators connecting to parts of the network with ample capacity could receive Firm Access
- Generators in parts of the network with limited capacity could connect on a non-firm basis, in advance of the completion of their ATRs, but would not receive compensation if they are dispatched down

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Background

- Process for connecting generators:
  - Calculation of Associated Transmission Reinforcements (ATRs) and Firm Access Quantity (FAQ)
  - Firm access for generators
  - Governed by CER directions and decisions
  - Technical network analysis used to identify constraints & ATRs
- ATRs were identified in 2009 (for Gate 3)

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Review of FAQs and ATRs

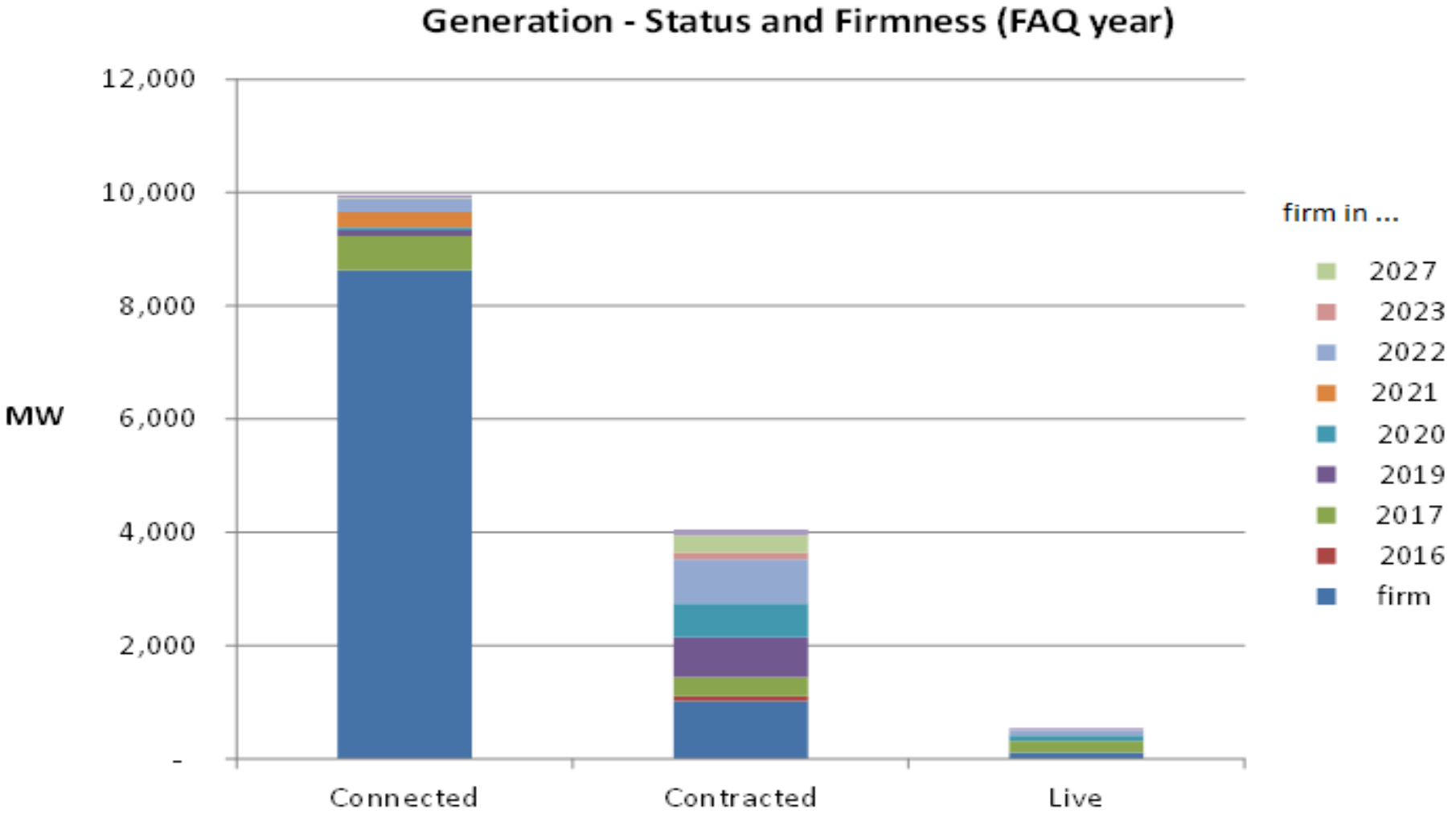
- Several types of reviews are undertaken by EirGrid:
  - Quarterly ATR Status Updates available on internet
  - The justification for individual reinforcements is ongoing
  - Association Reviews
    - 2013 (rerun ITC)
    - 2016 (review of associations)

Why review now?

- Timely
- Latest information
  - Generator Connections and Contracts
  - Reinforcement Delivery
  - Constraints

Scope

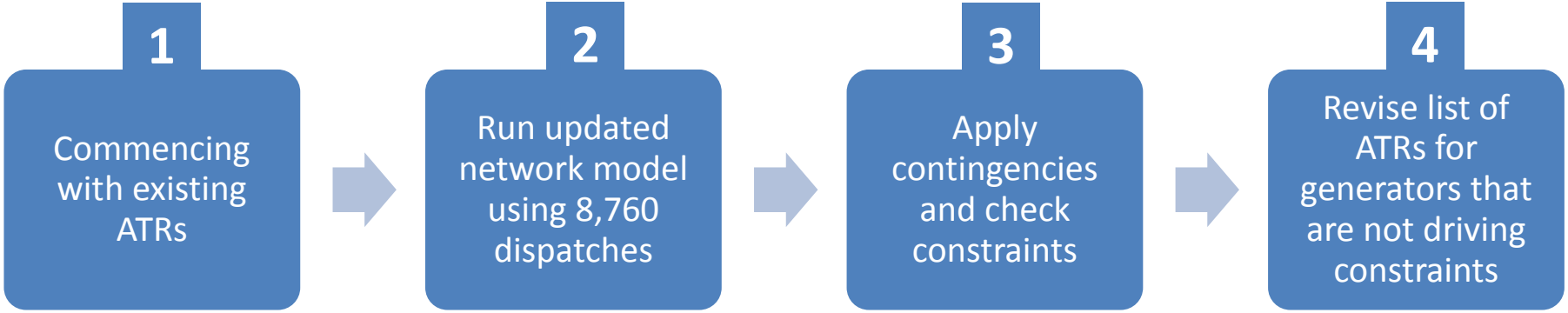
- Ireland only
- Does not include Non GPA generators which don’t have ATRs and which are also non-firm


Generation - Status and Firmness (FAQ year)
MW
12,000
10,000
8,000
6,000
4,000
2,000
-
Connected
Contracted
Live
firm in ...
2027
2023
2022
2021
2020
2019
2017
2016
firm

Approach

- This is a review of existing associations
  - Not seeking to identify additional associations
- This is not a re-run of ITC
- Introduce generator profiles, demand profiles, etc.
- Assess impact of generators and reinforcements on constraint levels
- Study generators in the network with and without ATRs

Approach (2)



- Multiple Studies
  - With and without generators
  - With and without network reinforcements
- Generators are added in gate order, in year they achieve FAQ

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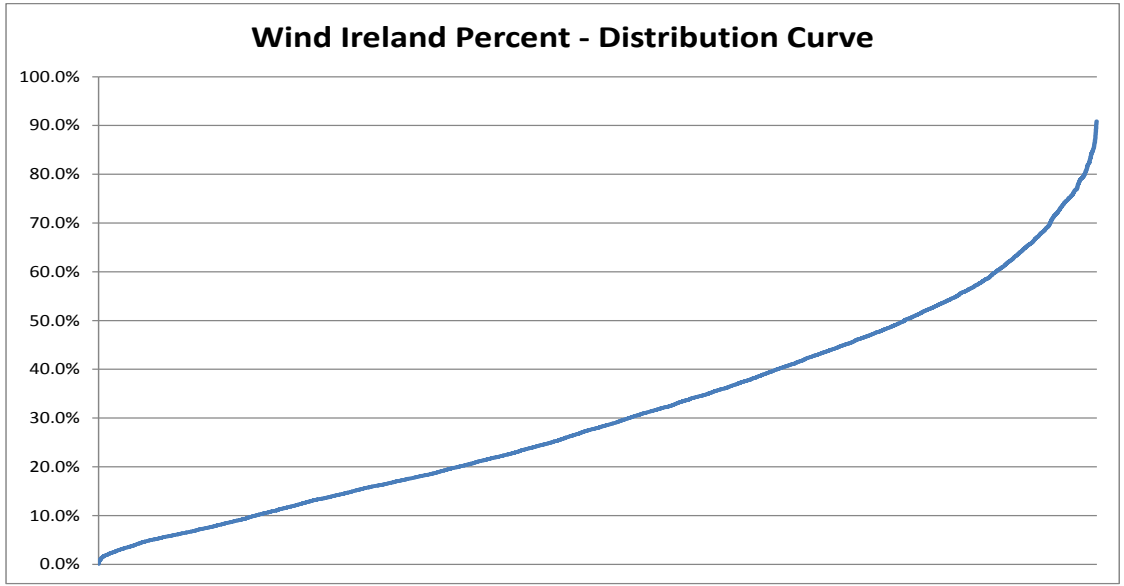
Approach (3)

- Generation Profiles (wind) and Generation Dispatch (bid based and must run)
- 8760 hours



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Studies Performed

- System Model
  - Demand
  - Existing Network
  - Base Generation (up to Gate 1)
- Multiple combinations of generation (firm and non firm) and future reinforcements

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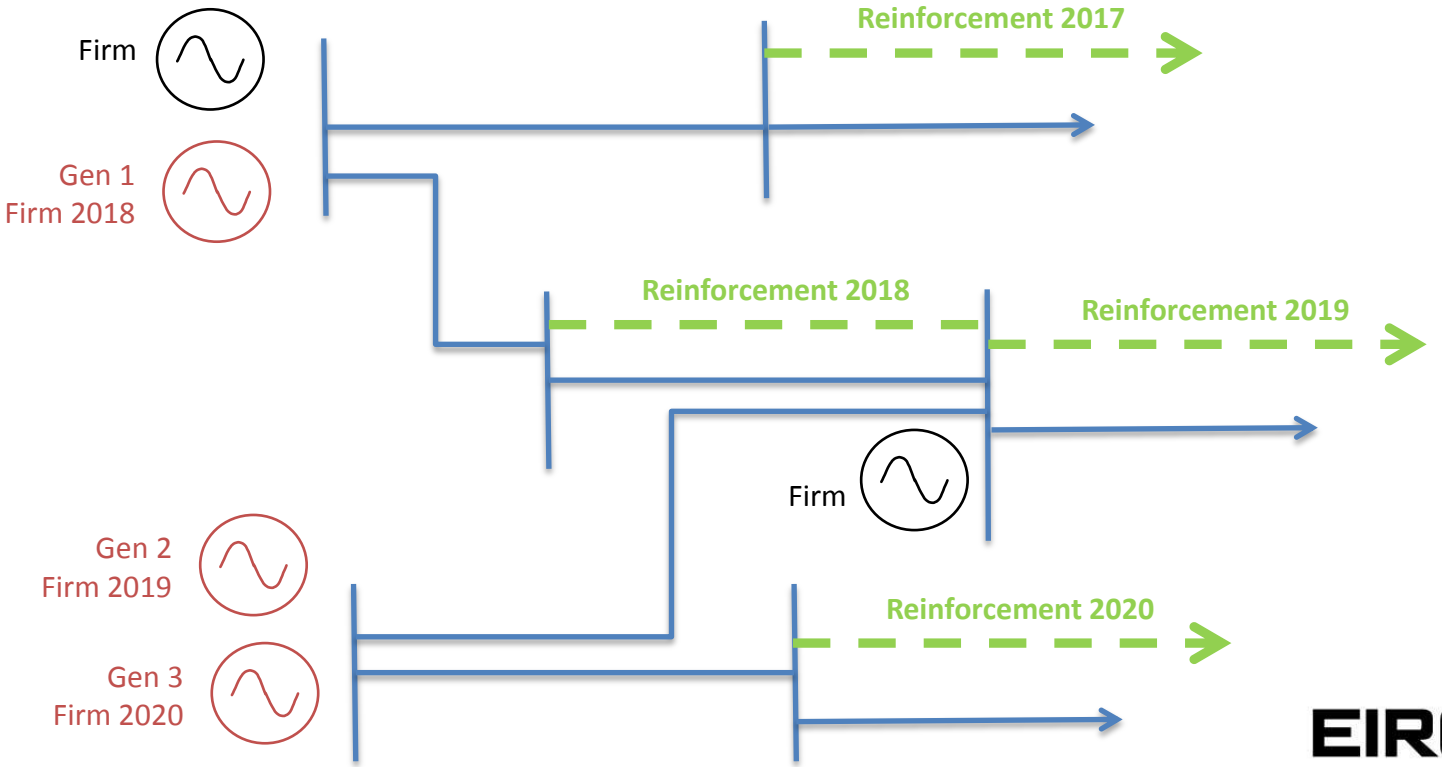
Indicative study matrix …

Cumulative reinforcements

Cumulative Generation

	Existing Network	Reinforcem 2016	2017	2018	2019	2020	…	2027
Generation up to Gate1	X							
Gate 2 – firm	X	X	X	X				
Gate 2 – non firm	X	X	X	X	X			
Gate 3 – firm	X	X						
Gate 3 – faq 2016	X	**X**	X					
Gate 3 – faq 2017	X	X	**X**	X				
Gate 3 – faq 2018	X	X	X	**X**	X			
Gate 3 – faq 2019	X	X	X	X	**X**	X		
Gate 3 – faq 2020	X	X	X	X	X	**X**	X	
…	X	X	X	X	X	X	**X**	X
Gate 3 – faq 2027	X	X	X	X	X	X	X	**X**

Illustrative example



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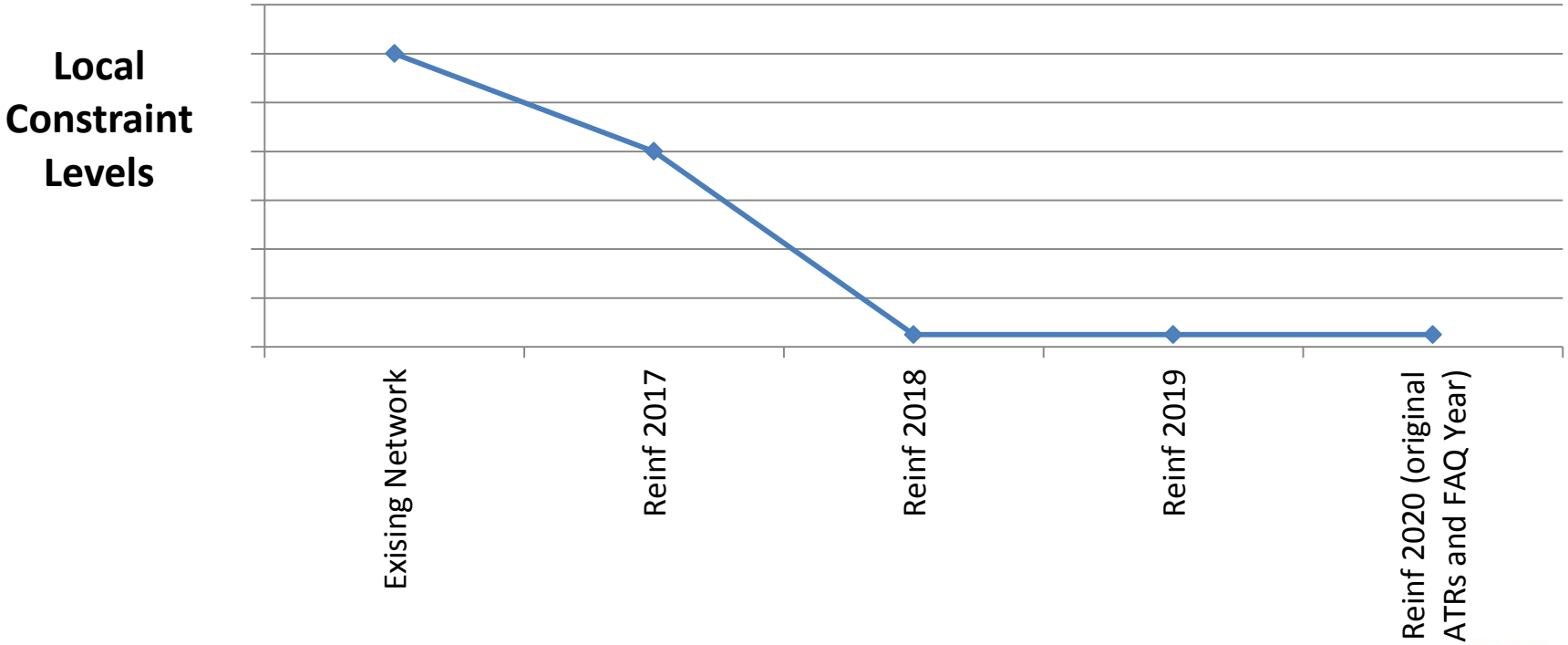
Example: Generation Originally Firm in 2020

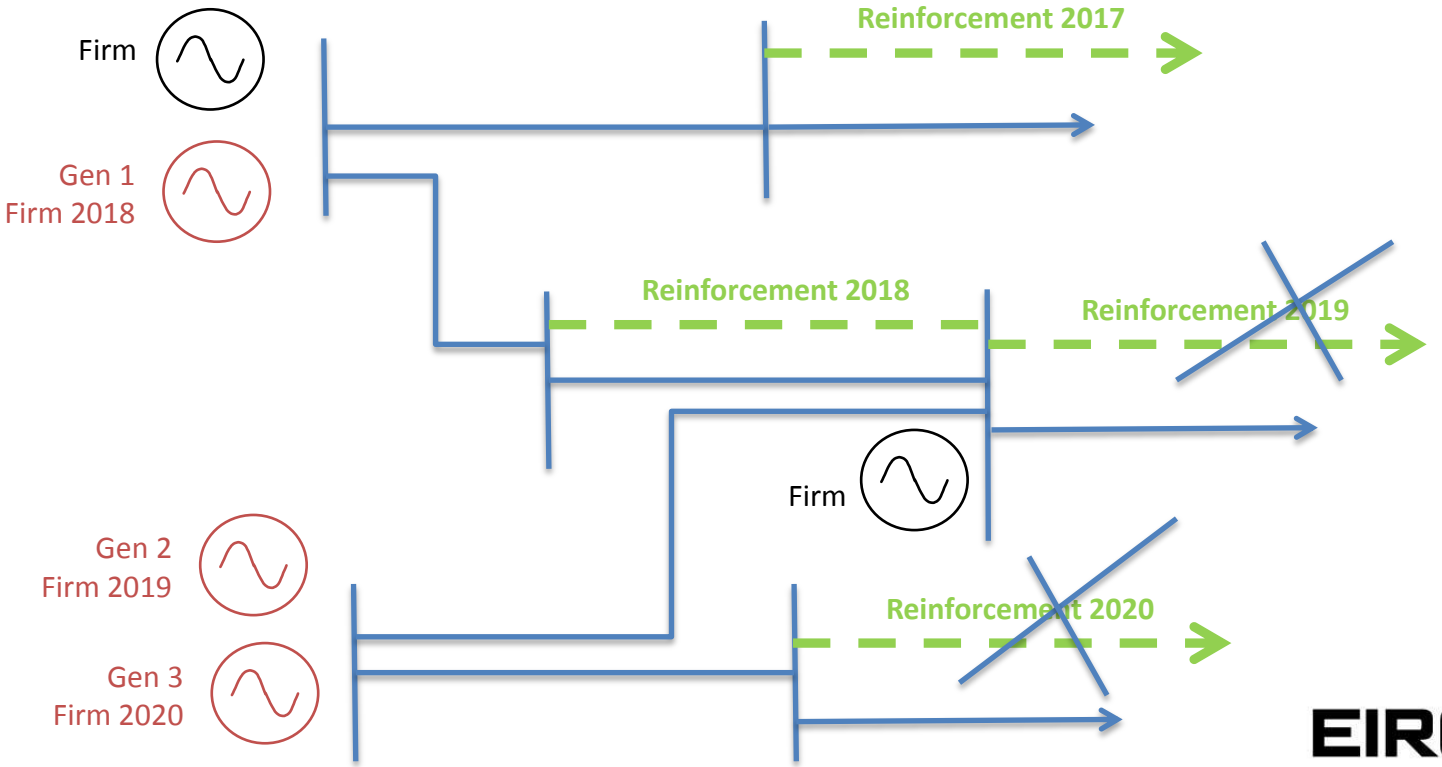


Approach:

For a given group of generation, add network reinforcements

Variation in constraints used to assess Associations

Illustrative example



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Observations

Observations

- Curtailment
  - At high levels of installed generation, simulations show curtailment as well as constraint
  - 14,400 MW of generation for a system with an average demand of 3,000 MW
- Uncertainty
  - Generator retirements, generator connections, transitional arrangements, etc.

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Observations (2)

- Connected / Contracted / Live
  - All generators in the assessment, both connected and not yet connected
- Generation
  - Bid based (oil, coal, gas, distillate, etc.)
  - Other (wind, wave, waste, solar, industrial, biomass, peat, hydro, etc.)

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Results

Introduction to Results

- To make 4600 MW of generation firm, additional transmission reinforcements are going to be required

- The revised approach has made a difference at the margins. The review has benefited some generators that were nearly firm already

Results

- No change to reinforcements required by the system
- The majority of associations remain
- Some generators do have ATR associations removed from their list

	Non-firm prior to Review	Generation whose list of associated ATRs will now reduce
Capacity	**4600 MW**	**430 MW**
No. of generators	**180**	**18**

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Results (2)

- Writing to generators with reduced ATR Lists
- May have financial implications for some of these
  - Other considerations (not connected yet, on temporary connection, etc.)
- Discuss with SEMO

Next Steps

- Impacted Customers, Industry generally and CER have been appraised
- Published briefing note (14th Nov.) www.eirgridgroup.com
- Presentation at next Generation Liaison Group

For additional queries,

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- Market questions for SEM-O markethelpdesk@sem-o.com

Webinar Questions