CSMART: Driving Innovation through Collaboration and Data Integration

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Center for Smart Grid Applications, Research, and Technology

- Transformation is happening across the industry impacting ALL participants
- Smart Grid and Distributed Generation will change the way that consumers use and purchase their energy
- Smart Grid and DG are having significant impacts on the distribution utilities to manage power stability and the flow of data to customers and other eco-system partners.
- CSMART will test new technologies and their economics in an open way

Over the past decade, the #1 driver of US DG Growth has been solar PV installed capacity…

DG Growth and Solar PV Systems

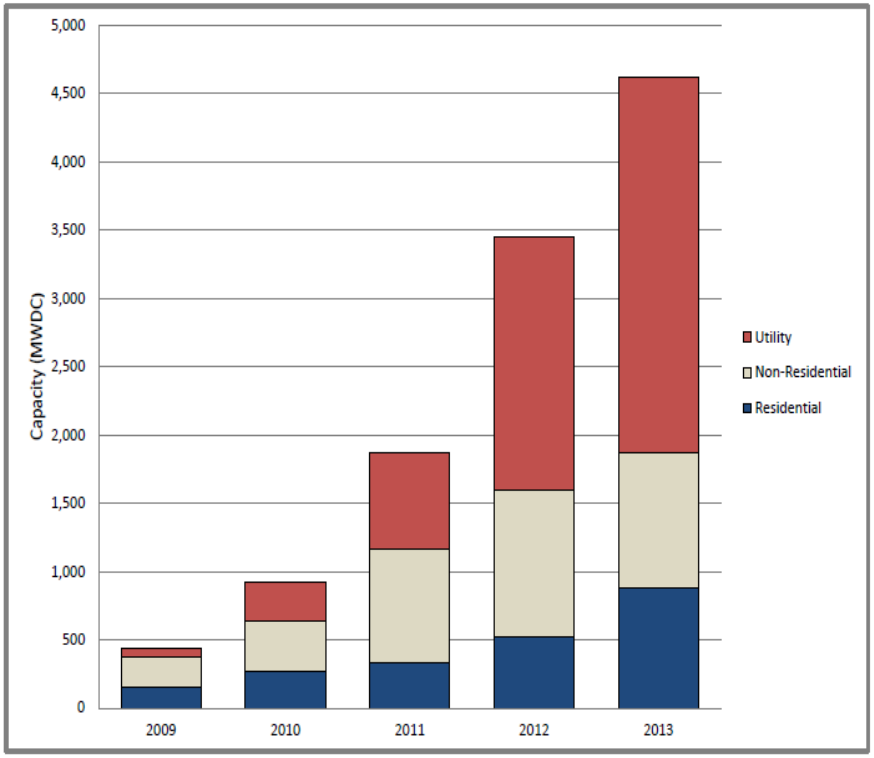
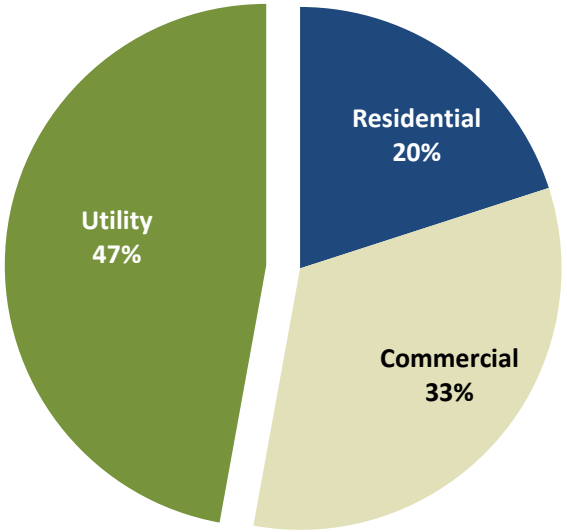


Figure 2: Annual Installed U.S. Grid-Connected PV Capacity by Sector (2009-2013)

12 GW of solar PV installed in US (end of 2013)



53% of US solar PV capacity (or about 6 GW) is feeding into distribution grid systems

http://www.irecusa.org/wp-content/uploads/2014/07/Final-Solar-Report-7-3-14-W-2-8.pdf

… and volume of Interconnection and Net Metering applications.

- Over 150,000 unique solar PV installations occurred in 2013 (compared to ~500 centralized installations greater than 1 megawatt capacity).
- At the end of 2013, 471,000 PV installations were connected to the U.S. grid, including 420,000 residential installations.
- NOTE: The vast majority of solar is being installed in only a handful of states

DG Growth and Solar PV Systems

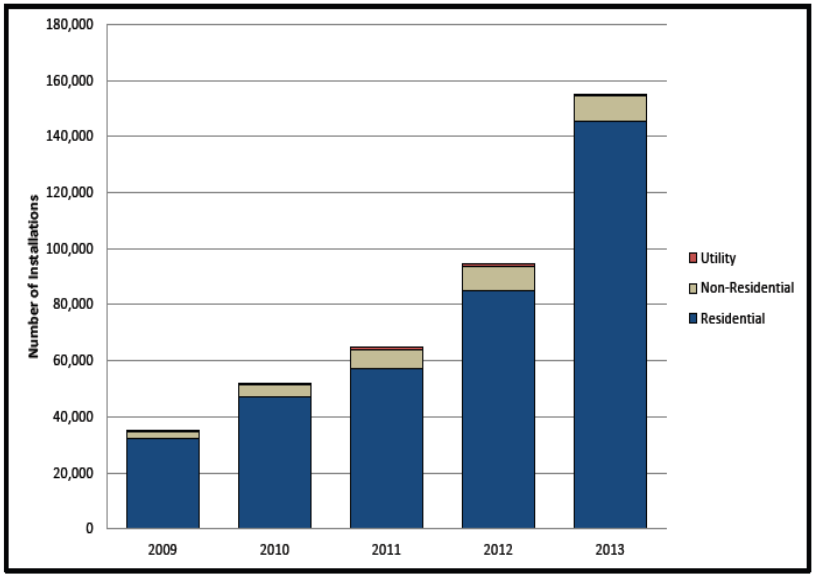
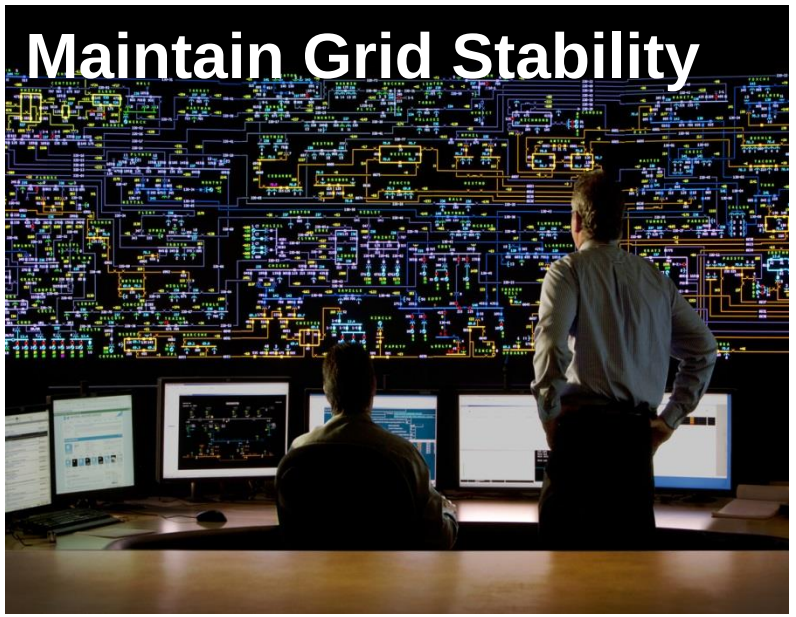


Figure 4: Number of Annual U.S. Grid-Connected PV Installations (2009-2013)

Translation: Every MW of solar PV capacity translates to 300 – 500 utility applications.

http://www.irecusa.org/wp-content/uploads/2014/07/Final-Solar-Report-7-3-14-W-2-8.pdf

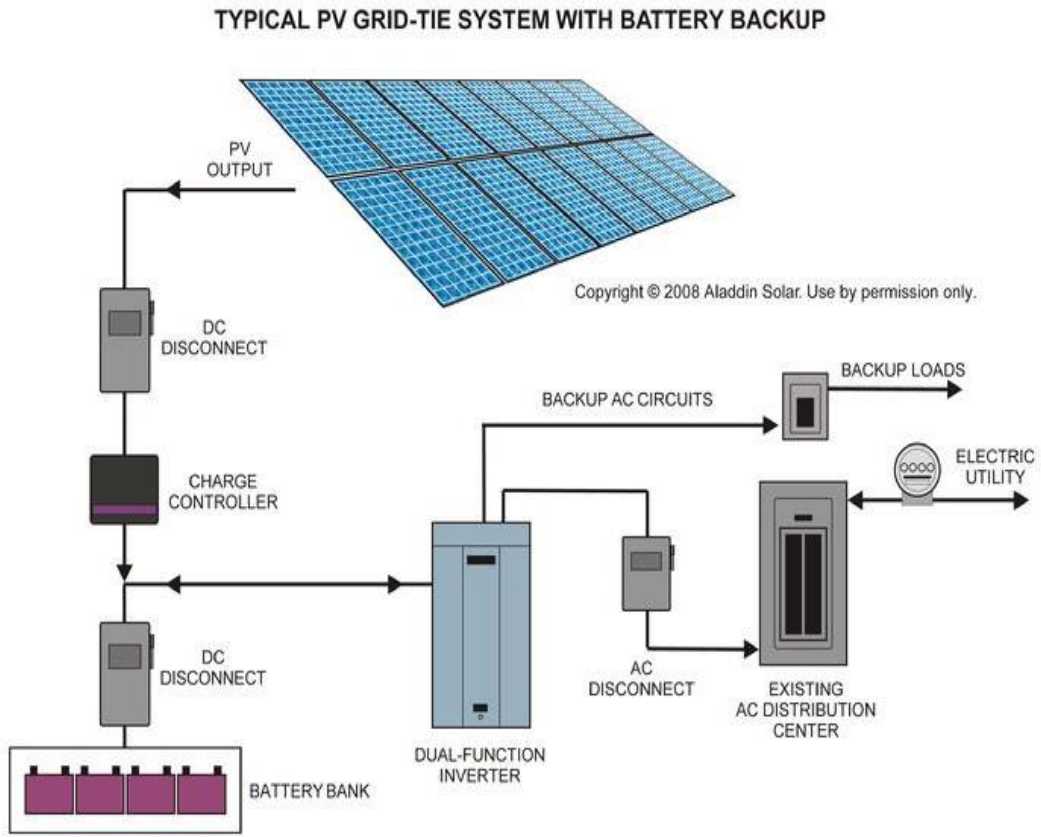
Distribution Utility Goals



Automate the Interconnection Process

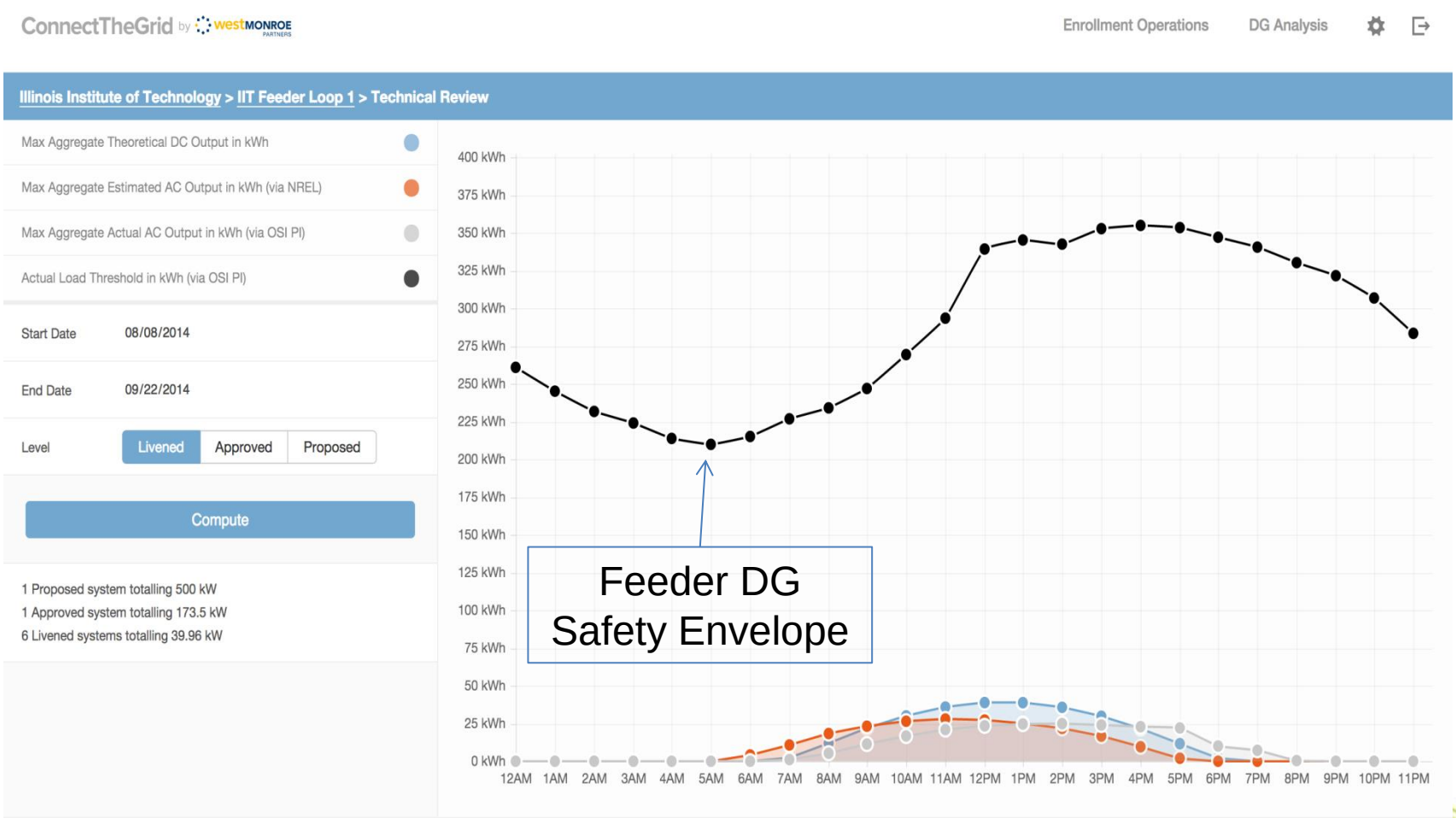
Getting to More Solar Capacity

Challenge: Maintaining Grid Resiliency
Result: Conservative Technical Screening Rules



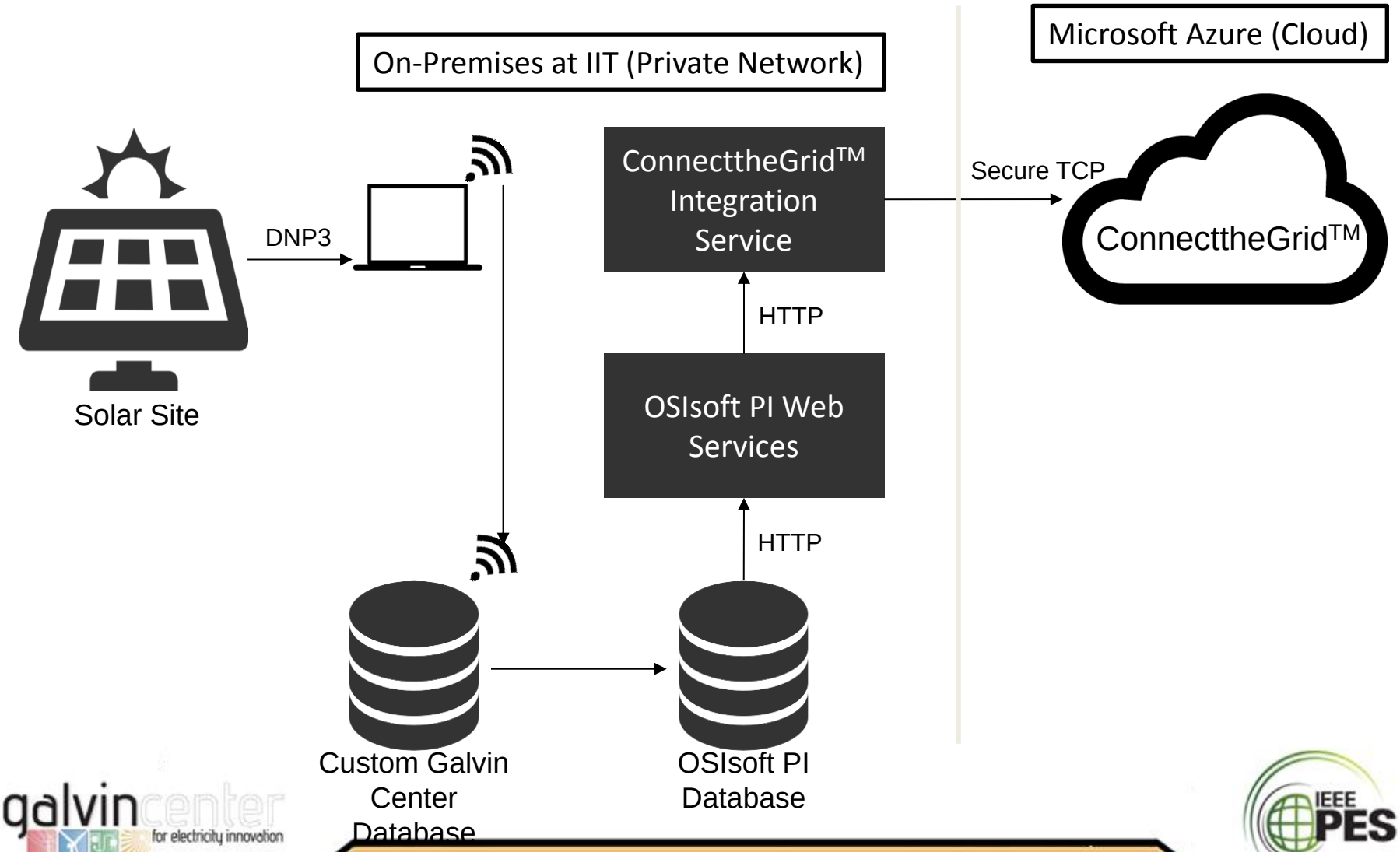
Actual Output Varies Based on Many Factors

Comparing the Feeder DG Safety Envelope to Existing DG Output

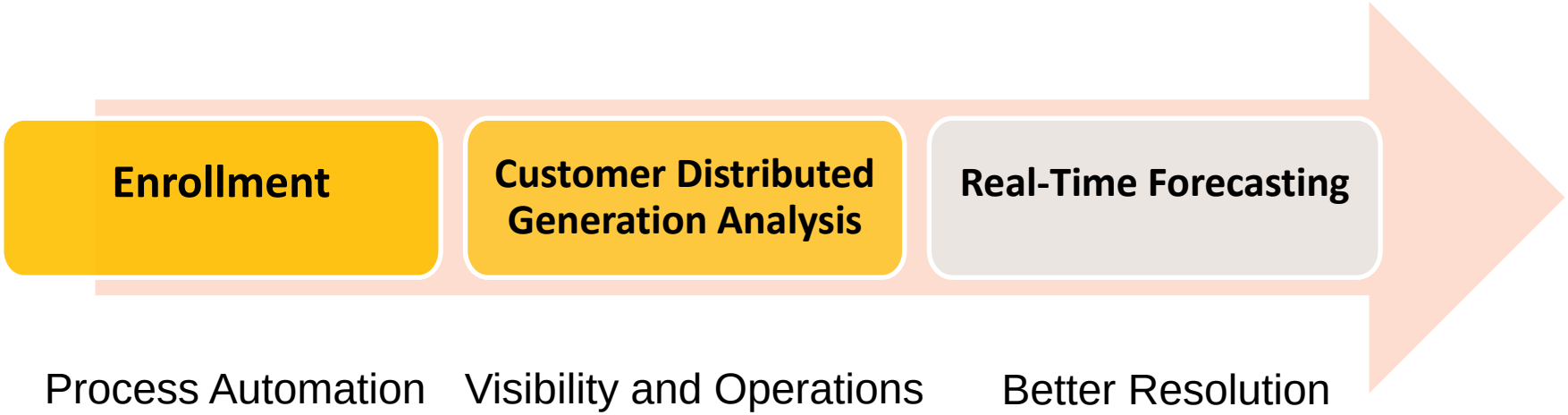


Comparing the Feeder DG Safety Envelope to Proposed DG Output

CTG IIT Integration: Architecture Diagram



ConnecttheGrid™: Enrolment to Forecasting



Thank You!

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