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Distributed Generation

Changing and Challenging Times in the Utility Business



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Traditional Utility Model

- Large Central Power Station
  - Power stations with a supply of water
  - Wind farms where wind resource is best
  - Solar where we can maximize solar production
- Economies of Scale
- Connected to Transmission Grid
- Pooled to serve all customers
- Regulatory model allocates costs for Generation, Transmission and Distribution systems to all customers

Distributed Generation Model

- Generation located on customer property, owned by customer
- Connected to the Distribution Grid
- Potential to reduce need for central power plants and new transmission
- Reduced energy costs for DG owner

BUT...

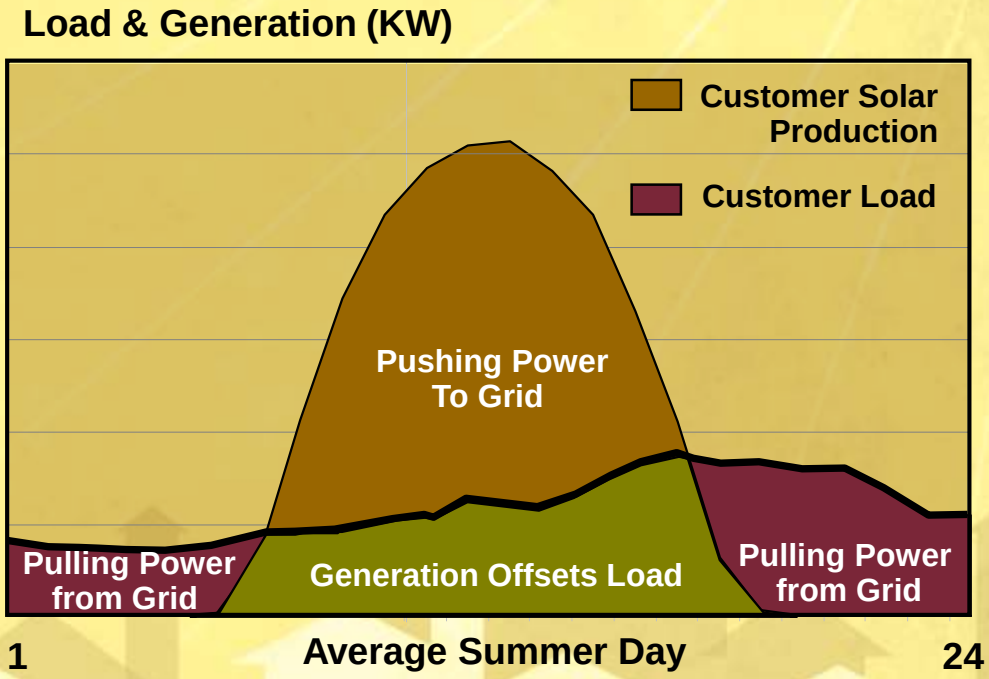
- Today, DG solar costs more than central station power, and more than utility scale solar power
- Not all customers can participate
- May require Distribution Grid upgrades.
- With net metering, how do we pay for the grid?

Don’t Forget the Grid

- Utilities must maintain a resilient and reliable grid for all customers.
  - Transmission Grid brings power from central generation to substations
  - Distribution Grid brings power from substations to homes and businesses.
- In current regulatory model, the grid is paid for as part of the per KWh charge
- Grid enables solar customers to deliver and receive energy when they need to

The Grid Enables DG Solar

- Provides power during non-solar periods, takes power during solar periods – the grid is a “battery”
- Starts up and operates motors and appliances



What happens to the Grid Costs that are not paid by the DG customer?

- Current regulatory model
  - DG customers reduce their Kwh, lowering their contribution to pay for the grid. Utility “under-recovers” its costs
  - Utility cost recovery is “re-set” at the next rate case, spreading the same costs over fewer Kwh.
  - Cost of the grid, per Kwh, goes up for all customers
  - Customers who cannot reduce Kwh pay more

Shared Goals

- Support growth of solar energy, while…
  - Maintaining a strong grid.
  - Sharing costs equitably
  - Allowing customer choice
  - Continue efficient resource planning

- How do we get there?
  - The Minnesota Model: work together to evolve business and regulatory models that work for all stakeholders

Thank you!

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