

Integrative Best Practices and Technologies for Local Power

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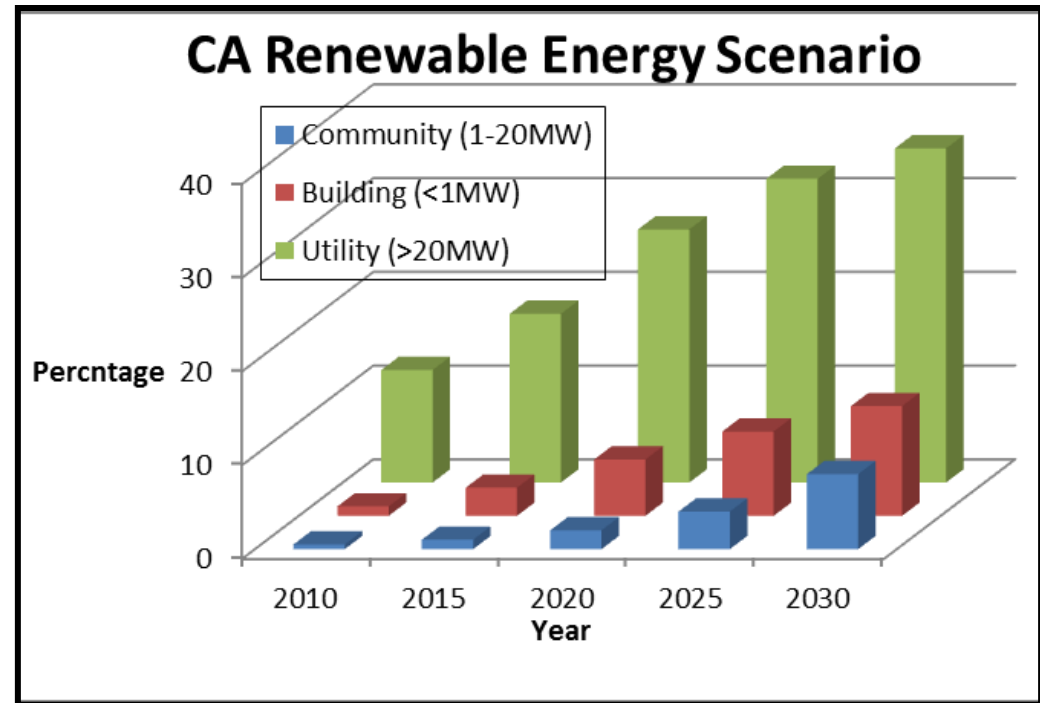
Questions

- Which local power technologies will:
 - disrupt?
 - evolve most rapidly?
 - enable adaptation?
 - be subject to breakthroughs?
- What new best practices:
 - drive new business models?
 - sustain/update old business models?
 - transform markets and industries?

Energy Infrastructure Transformation

Which types of electric system assets will be:

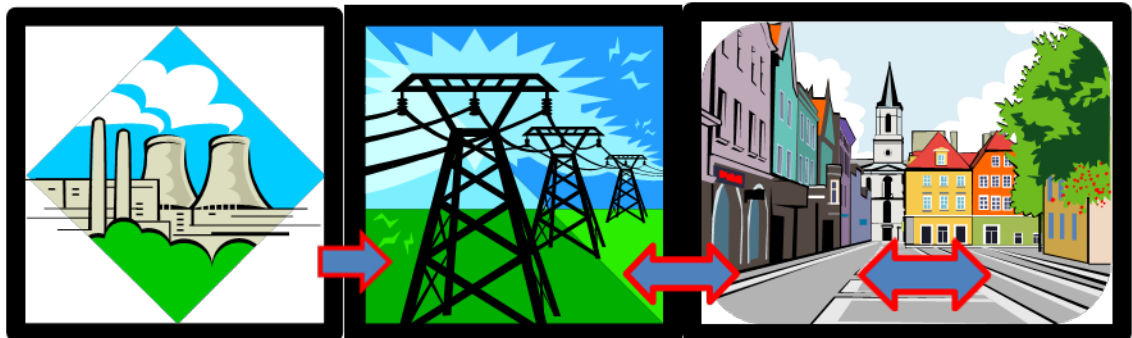
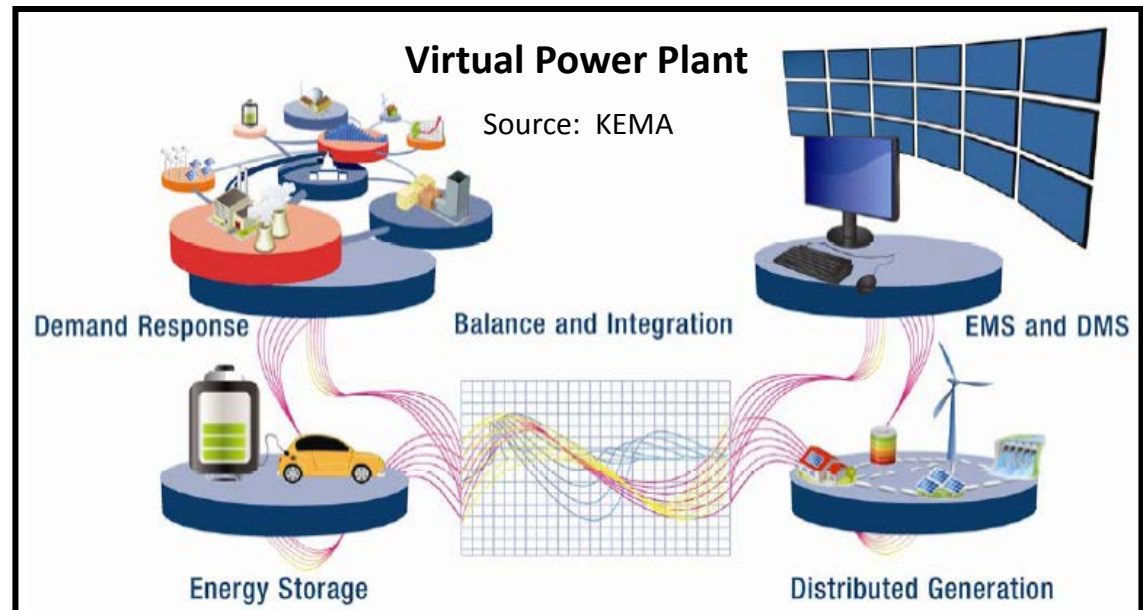
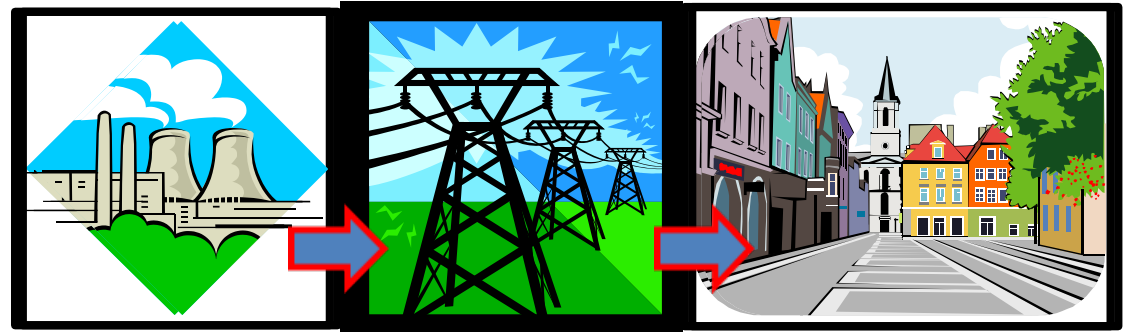
- changing rapidly?
- evolving rapidly?
- changing slowly?
- evolving slowly?



Source: IRESN, <http://iresn.org>

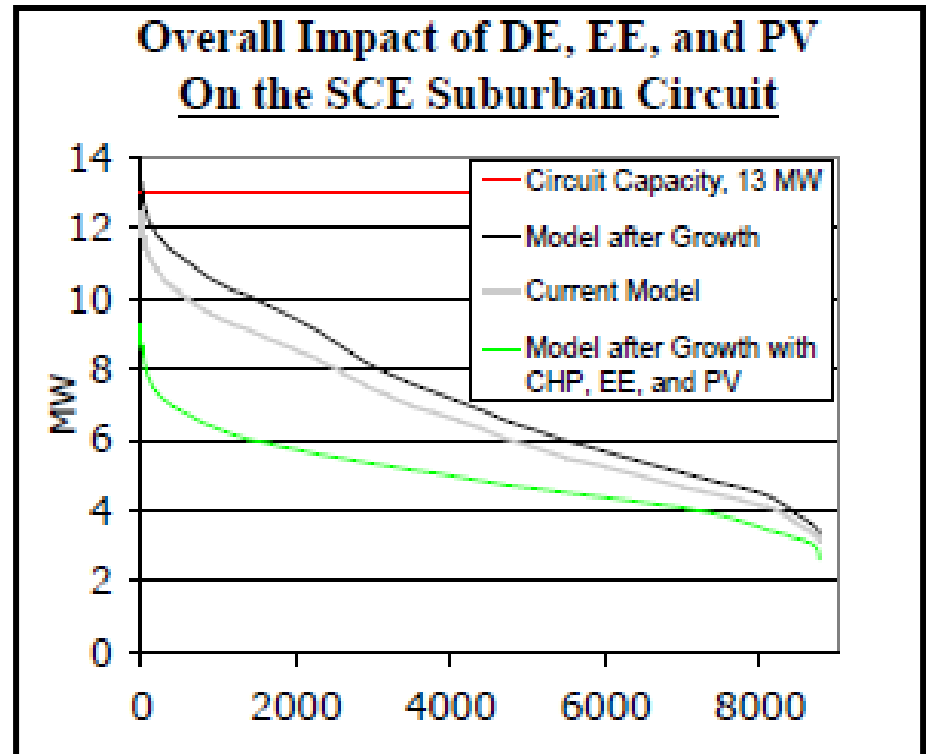
Trend to Localized Integration

- Local mini-grids and micro-grids able to purchase, sell and exchange electricity
- Infrastructure inter-operability
 - Electricity
 - Natural gas
 - Transport



Electric System Asset Utilization

Underutilization of electricity distribution assets is a major concern, as utilities and regulators plan for decentralized energy and increased penetration of solar and other DG.



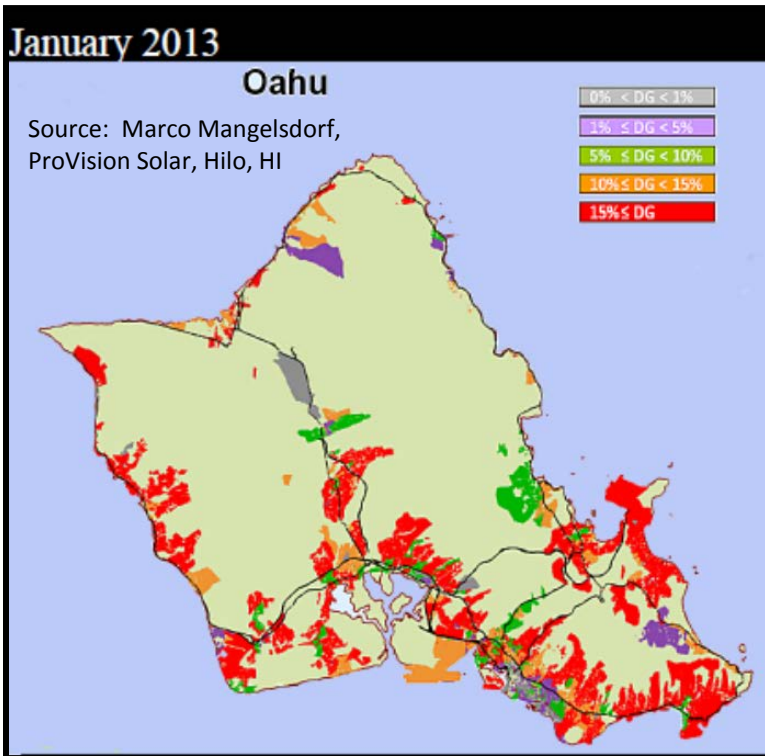
Source: ORNL/TM-2005/109, Exploring Distributed Energy Alternatives to Electrical Distribution Grid Expansion

Decentralized Energy Accelerators

- Variable, modular DG&S
- Net metering/net zero



Predictable revenue streams and short project lead times enable solar and wind energy projects to attract low cost capital. Net metering enables rapid deployment. Net zero standards may as well.



California's New Solar and DG Laws

- AB 327
 - Removes residential ratemaking restrictions in past legislation
 - Authorizes procurement of renewable resources beyond the current 33% RPS target
 - Removes the impending 2015 Net Energy Metering (NEM) Program suspension
 - Establishes a process for the CPUC to develop and implement new NEM Program rules (including uncapped NEM as an option) by July, 2017.
- SB 43
 - Requires an additional 600 MW of renewable energy procurement (from generating systems up to 20MW) through the establishment of a green tariff pilot program
 - Pilot will allow investor-owned utility (IOU) customers to purchase up to 100% of their energy needs from new renewable projects.

Educated Guesses

Technologies

- Solar PV and electric vehicles will disrupt.
- Vehicle from/to grid will evolve most rapidly.
- Flexible DG and storage-coupled solar will enable adaptation.
- Micro-grids will break through, soon.

Best practices

- Virtual net metering and local finance will drive new business models.
- Utilities, regulators and centralized finance will sustain/update old business models.
- For-profit intermediaries/aggregators and IT companies will transform electricity markets and industries.

Thank You!

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