



Energy Innovation and Technology Transfer: Speed and Scale

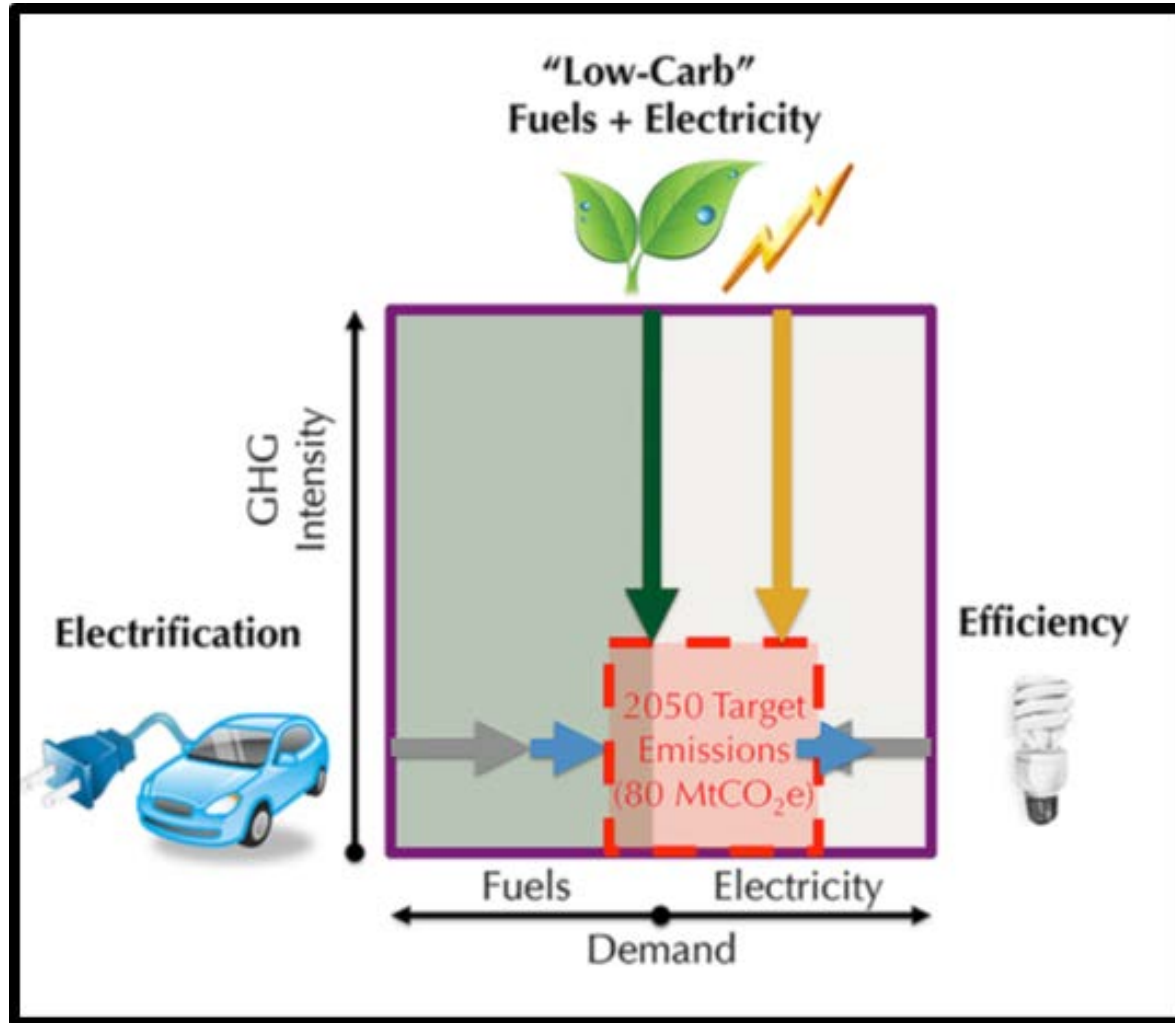
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21ST OSCE ECONOMIC AND ENVIRONMENTAL
FORUM

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Generalized Climate Strategy



Accelerators

- Modular supply technologies

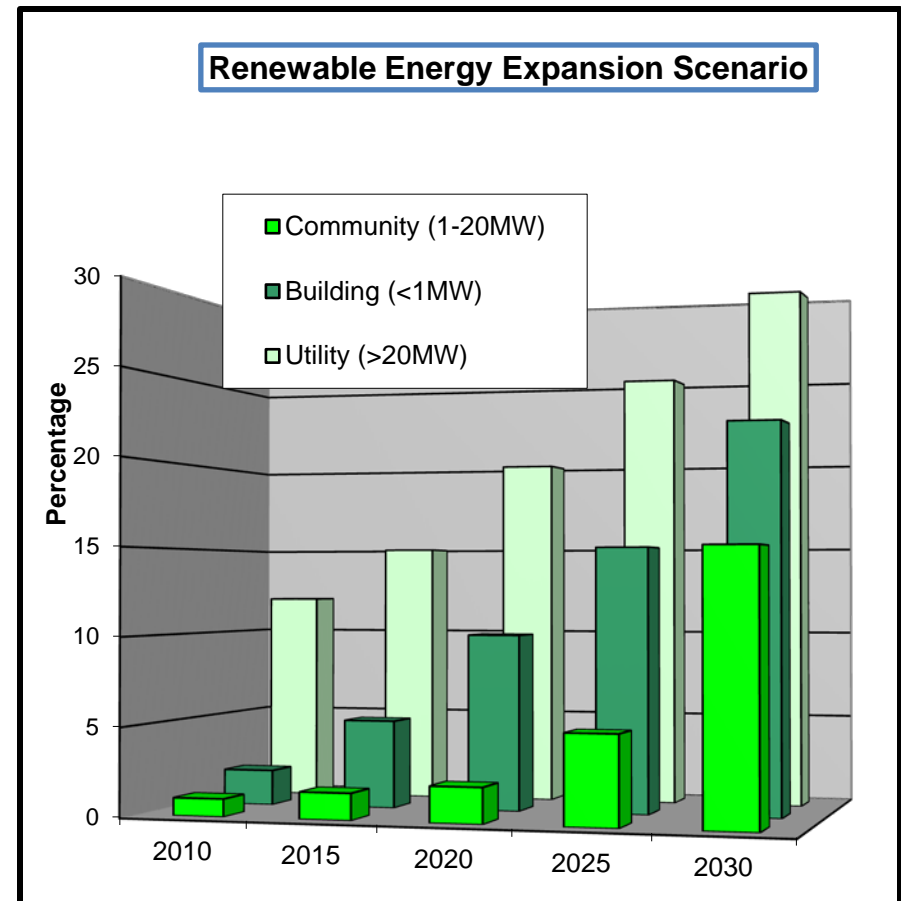
- Solar
- Wind



Predictable revenue streams enable solar and wind energy projects to attract low cost capital

Energy Infrastructure Transformation

- Tactics
 - Add decentralized supply
 - Transform local infrastructure
- Metrics
 - Local investment in local resources
 - Local ownership and planning of smart infrastructure
 - **Net positive buildings and communities**



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

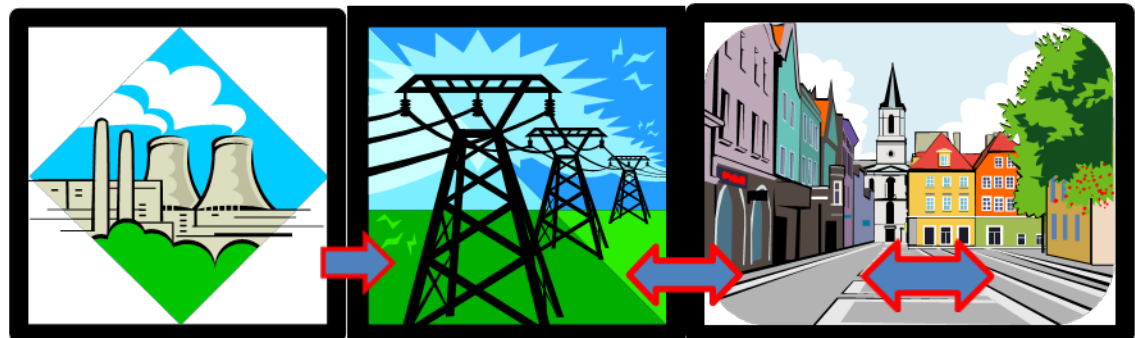
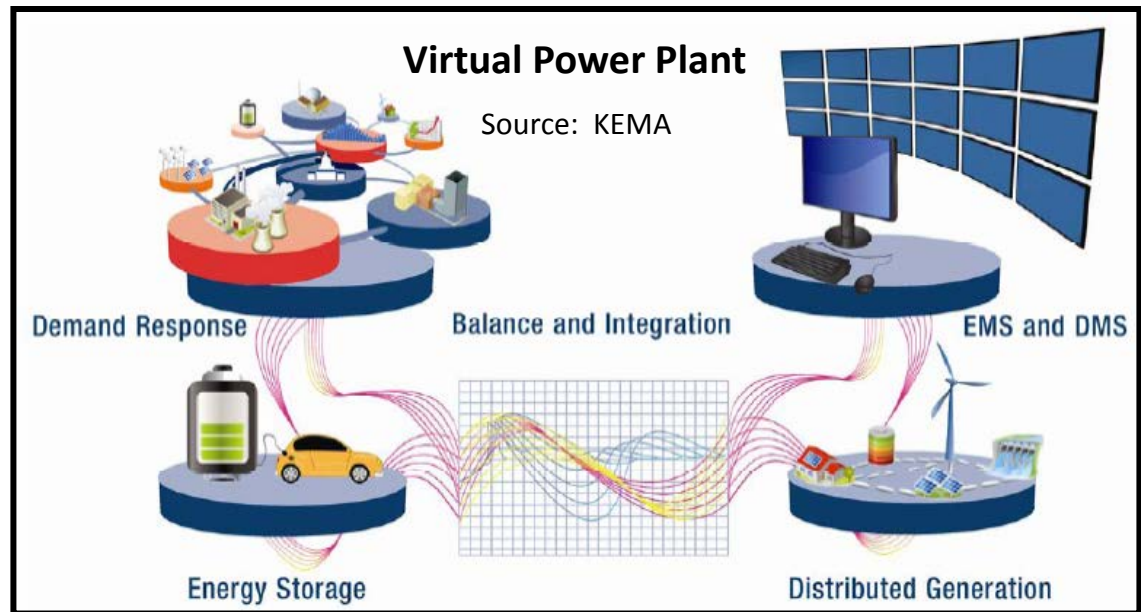
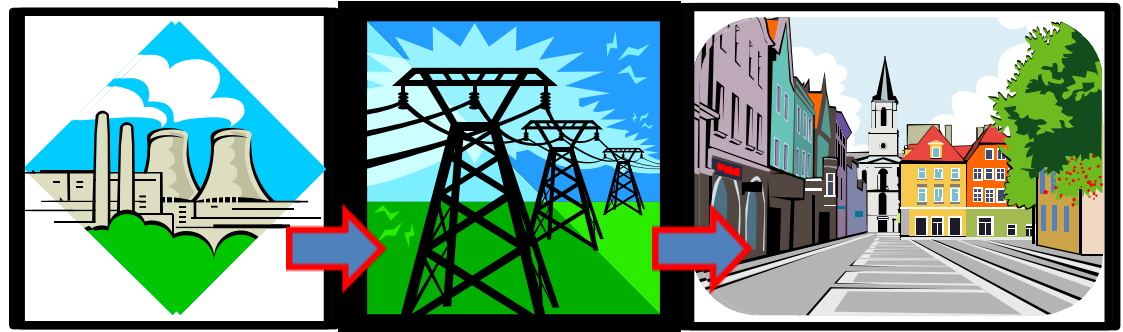


Electricity Grid Innovation Drivers

- **Distributed and centralized electricity supply**
 - Bi-directional power flow at the meter and upstream
 - Pervasive “net” metering and “smart” meters
- **Actionable real time price information** (plus automated response at the point of use)
- **Energy user cost build-up:**
 - Supply and efficiency investments
 - Grid electricity and natural gas purchases
 - Virtual electricity and bio-gas purchases
 - Opportunity costs related to “use or sell” decisions
- **Policy emphasis on infrastructure modernization**

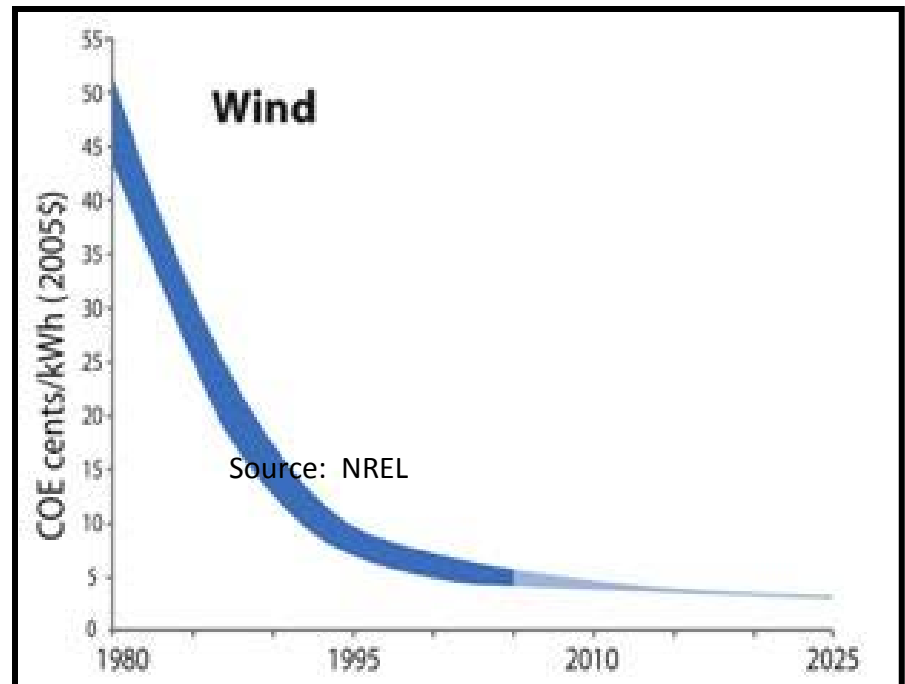
Resiliency and Innovation Targets

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



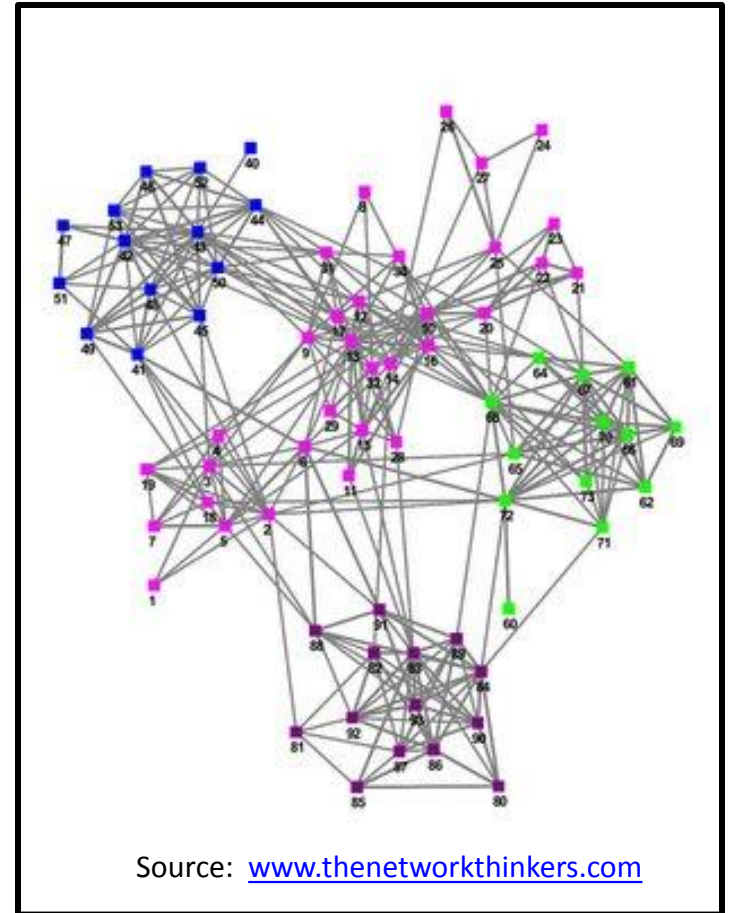
Clean Energy Innovation

- Modular technologies are subject to incremental innovation as well as production scale economies. Large centralized projects typically are not.
- Replace energy monopolies with competitive structures. Innovation responds to need and requires attentive investment. Monopolists do not need to innovate and are poor stewards of innovation.



Technology Transfer

- **Private sector competition** motivates healthy and focused interest in best practices and expedient collaboration. **Collaboration teaches.**
- Shared interests and vision motivate conversation. People are the most effective agents of technology transfer. Intentional **human networks** outperform conference industries.
- Public energy agencies and laboratories in the US face major technology transfer challenges.



Summary

- **The pivot of our energy future is the city or community that integrates its information, energy, water and waste infrastructure for sustainable economic purposes.**
- Need for specialists and generalists to more quickly, completely and confidently understand one another. **Need for purpose driven human networks and educational transformation.**

Thank You!

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<http://www.iresn.org>