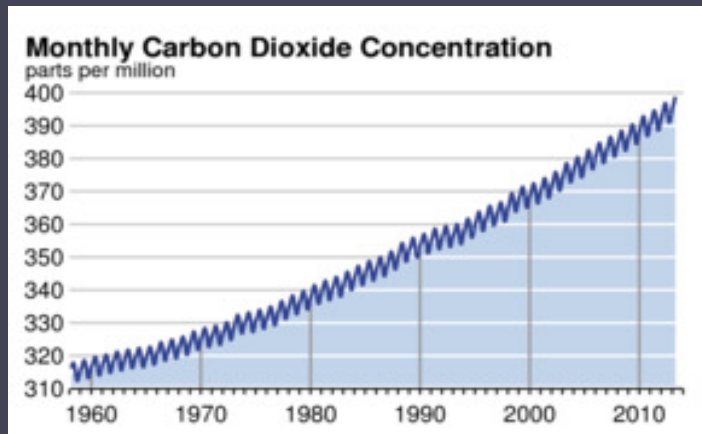


A Smarter Grid for Climate Change?



Hopewell Township, Nov 1, 2012
The Trentonian, Jackie Schear/AP Photo.

Jennie Stephens, Clark University, Worcester, MA USA

Elizabeth Wilson, University of Minnesota, Minneapolis, MN USA

Tarla Peterson, Texas A&M, College Station, TX, USA

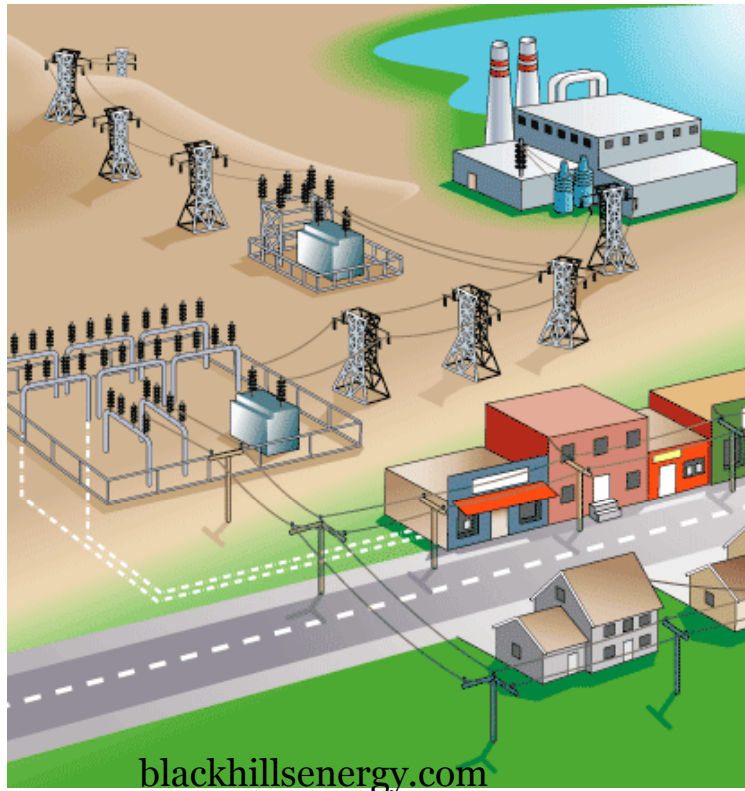
James Meadowcroft, Carleton University, Ottawa, Ontario Canada

May 2, 2013

Wakefield, Quebec

Unlocking the Potential of Smart Grids:
A Partnership to Explore Policy Dimensions

SMART GRID: A Shared Vision of Electricity System Change



Generation

Transmission

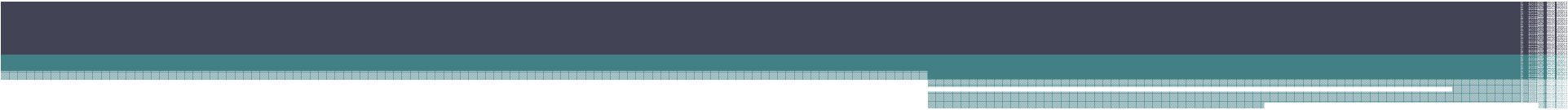
Storage

Distribution

Consumption

A shared vision of change , but different perspectives among key actors on:
Pace, orientation and goals of change

Why the system should change? Who will benefit from the change?
How much change ? How fast?

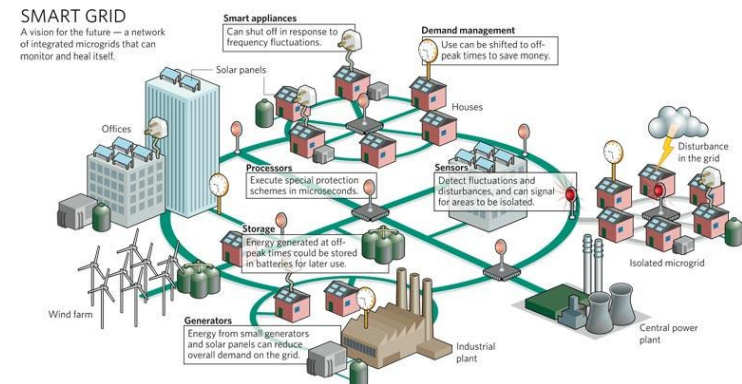


What does “smart grid” demonstrate about connecting climate objectives with other societal objectives?

How can climate objectives be most effectively integrated into “Smart Grid” innovation?

Multiple Potential Benefits of Smart Grid

- Reliability – reduce power outages, storm-proofing, hardening, self-healing – particularly prevalent post-Sandy
- Security – limits to informal/illegal connections
- Efficiency
- Renewable generation/integration
- Electrification of transport
- Local Control – Decentralization
- The SuperGrid – long-distance transmission



http://www.prism-magazine.org/jan11/feature_03.cfm

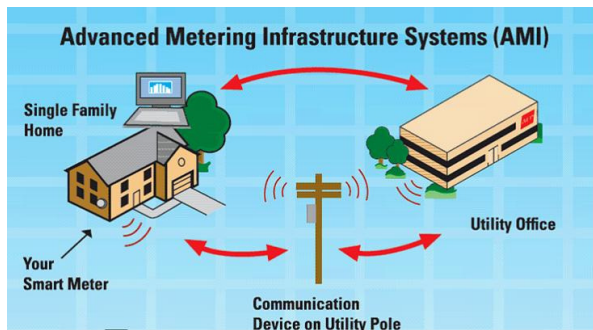
Climate Mitigation Potential ●

Climate Adaptation Potential ●

Co-existing but Diverging Priorities Among Actors

Key Actors	Priorities & Perspectives
Consumers	Reliability, low-rates, limited influence
Government (National, State, Local)	Multiple & jurisdictionally complex
Private Sector	Accountable to shareholders
Electric Utilities	Maintaining reliable service, responding to consumers
Technology companies	Innovative & entrepreneurial & technologically optimistic
IT companies	Fast pace of change
Environmental advocates	Low carbon shift & renewable energy
Energy system researchers	Technologically optimistic

Tensions Among Actors Evident in Smart Meter Rollout



AEP Texas, 2012



CEPRO, 2013

Opposition to Smart Meters

No obvious benefits to consumers

Privacy and security concerns

Mistrust of government and industry to protect data



<http://mnordan.com/2011/09/26/the-smart-grid-debacle-and-what-to-do-about-it>



StopSmartMeters.org 2013

Variance Across two Dimensions

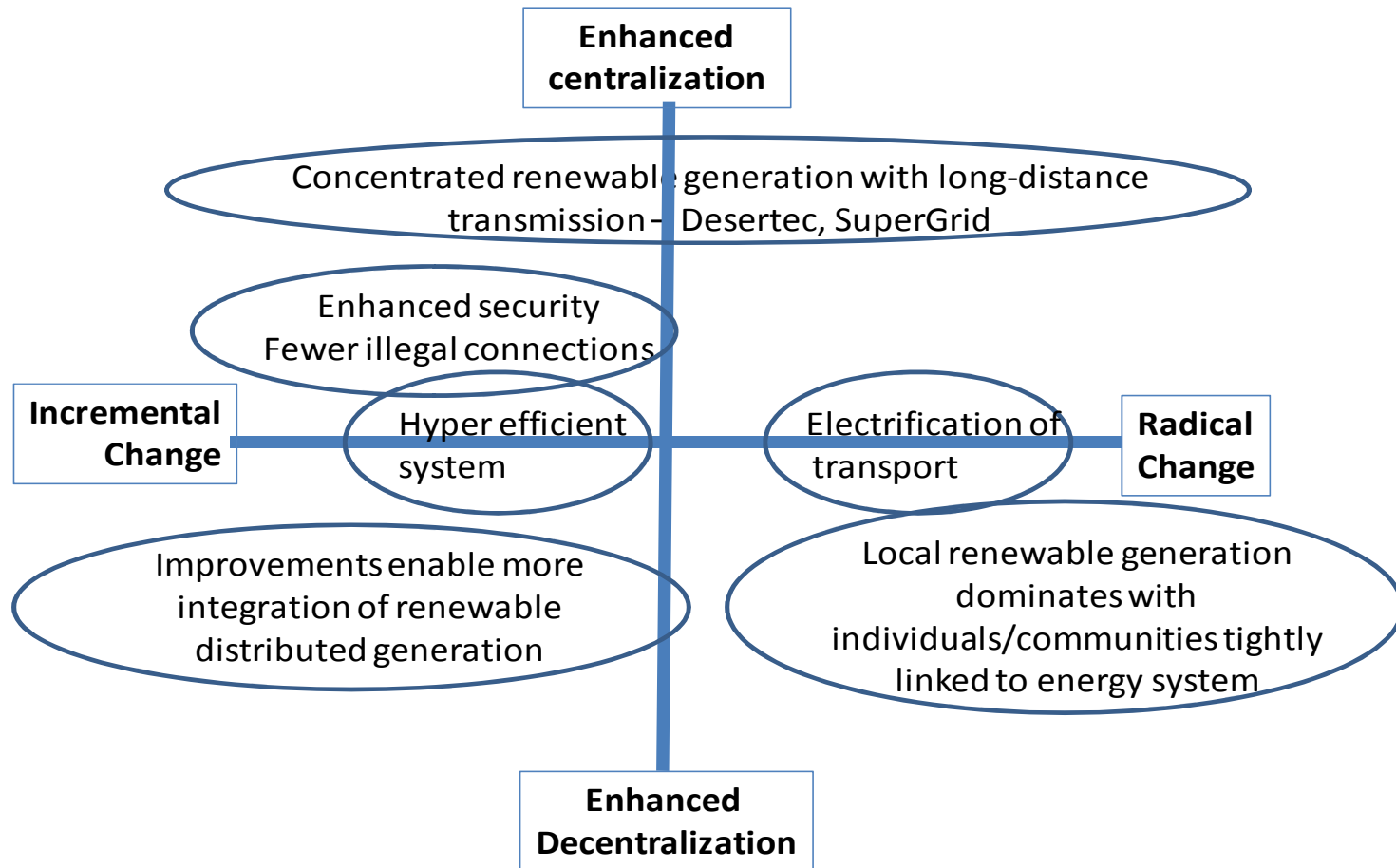


Figure 2. Actors' vision of the potential of Smart Grid can be characterized by perceptions of the possibility and need for radical versus incremental change and perceptions of a future with enhanced centralization or decentralization.

Fundamental Tension: Centralization vs. Decentralization

Decentralized Local Energy Systems

More local control, more community connections, distributed power



Smart Grid Enterprise 2013

Centralized – Supergrid with Long Distance Transmission

More centralized control, advantages of scale



Desertec - Eumena 2012

Example: Boulder Colorado –community with climate objectives struggling with Excel

Different Perspectives on How Much Change in the Smart Grid Vision

Incremental
Change

Radical
Change



Upgrades, modernization
of current system
Improving status quo

Technological nirvana
potential to solve all
problems

Variance Across two Dimensions

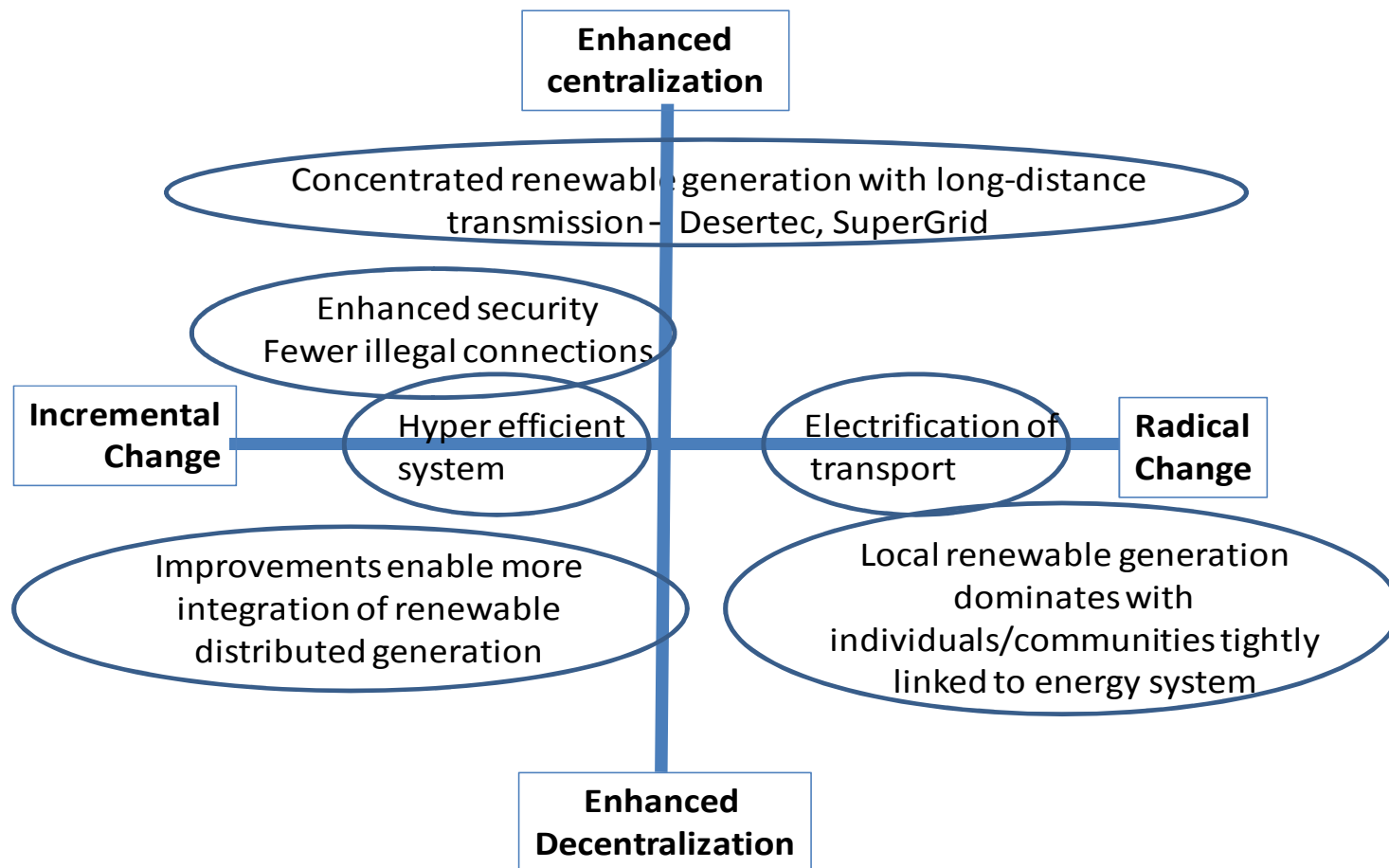


Figure 2. Actors' vision of the potential of Smart Grid can be characterized by perceptions of the possibility and need for radical versus incremental change and perceptions of a future with enhanced centralization or decentralization.

Linking Smart Grid (SG) Development with Climate Change (CC)

- Recognize plurality of societal benefits
 - Balance economic, social and environmental benefits
- Need to explicitly integrate climate mitigation and adaptation benefits
 - Current institutional structures and processes limit the potential to do this
- Potential Policy Principles for Linking CC and SG
 - Prioritize investments that reduce electricity demand
 - Support regulation that moves beyond electricity markets
 - Broaden regulatory framework to integrate longer-time horizon

Acknowledgements

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