

The Alternatives to Nuclear Power: Japan's Renewable Energy Options

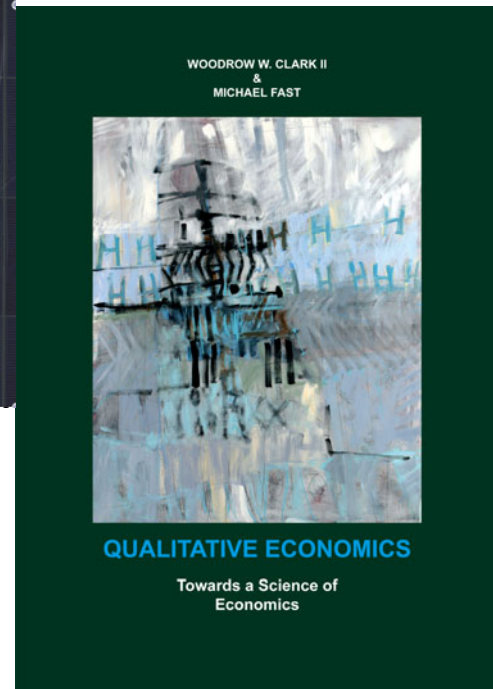
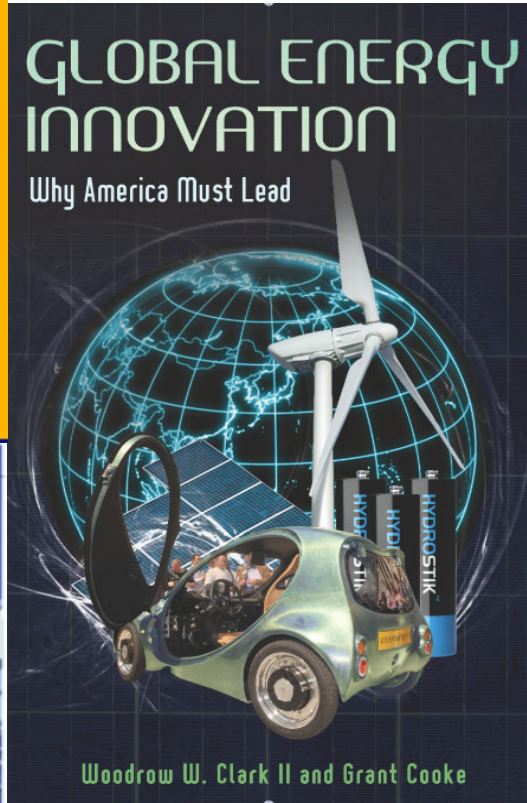
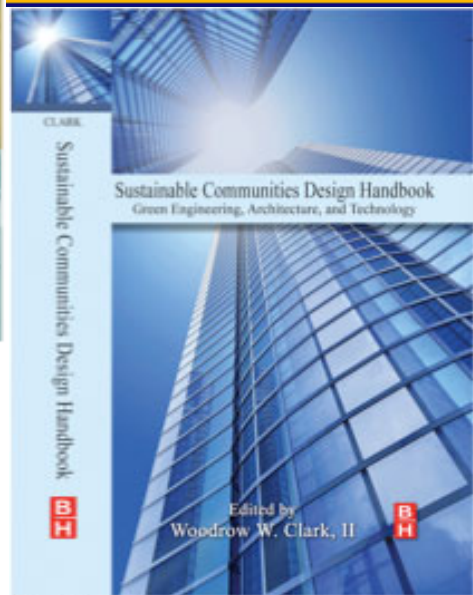
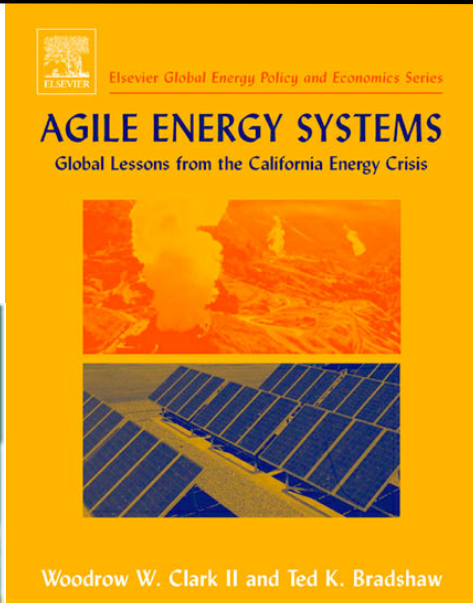


The Economics of The Green Industrial Revolution



ウッドロー・W・クラーク II MA3, PhD
 Woodrow (Woody) W. Clark II MA3, PhD
 Qualitative Economist
 Miyako Hybrid Hotel
 15 May 2013
 Torrance, CA

Sustainable Green Communities

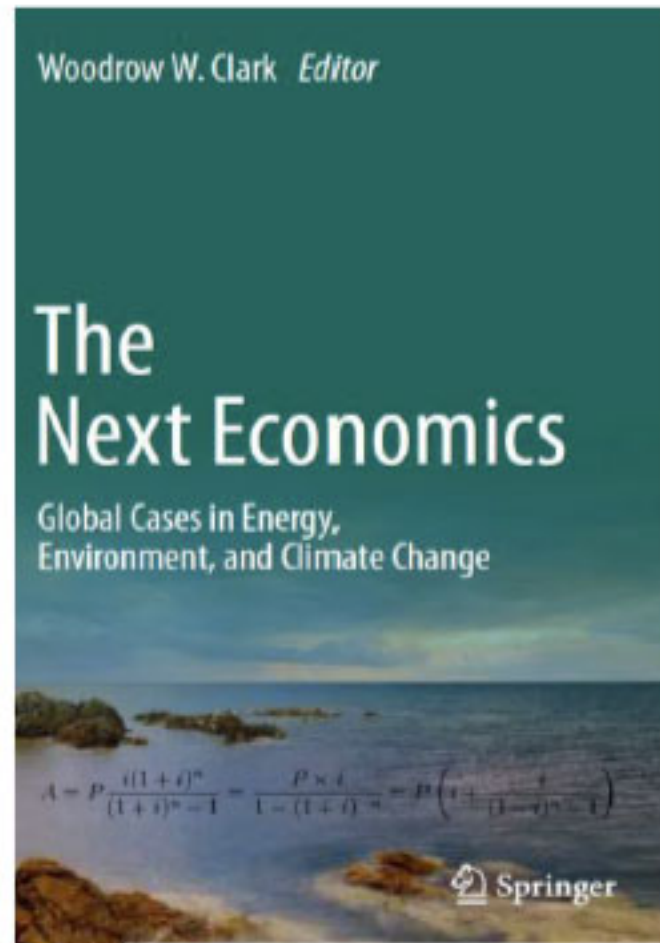


The Failure of Contemporary Economics



The Next Economics

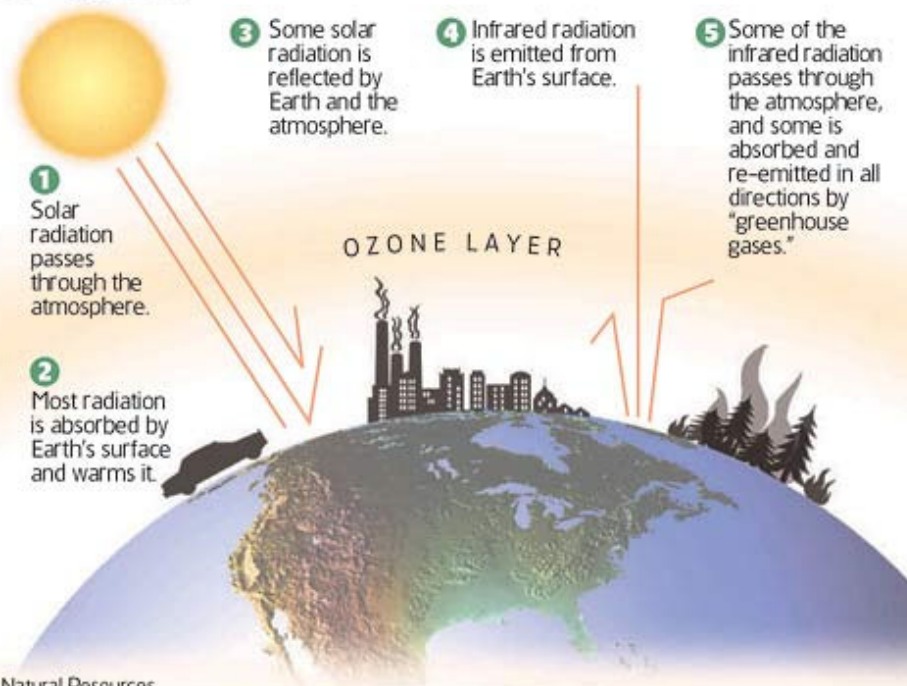
Woodrow W. Clark II, MA³, PhD
(Springer Press, 2012)



Paradigm Change: The World is Round – Not Flat

The “greenhouse” effect

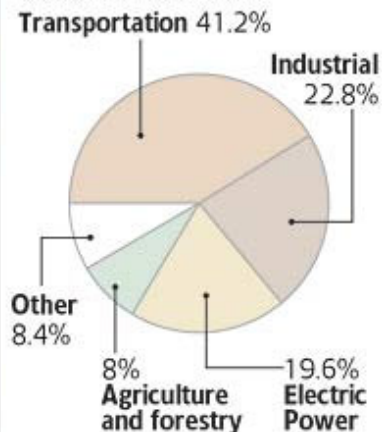
Carbon dioxide does not pose a direct threat to human health, but it absorbs Earth's reflective radiation from the sun, retaining heat like the glass panels of a greenhouse. This and other heat-trapping gases from vehicles, power plants and other sources of fossil fuel combustion help form a thermal blanket around the globe. This has the effect of artificially raising temperatures and changing climate.



Sources: California Energy Commission, Natural Resources Defense Council, U.S. Environmental Protection Agency

California's emissions sources

Vehicle exhausts are the single largest source of California's climate-changing emissions, followed by releases from industrial and power plants, most fueled with natural gas.

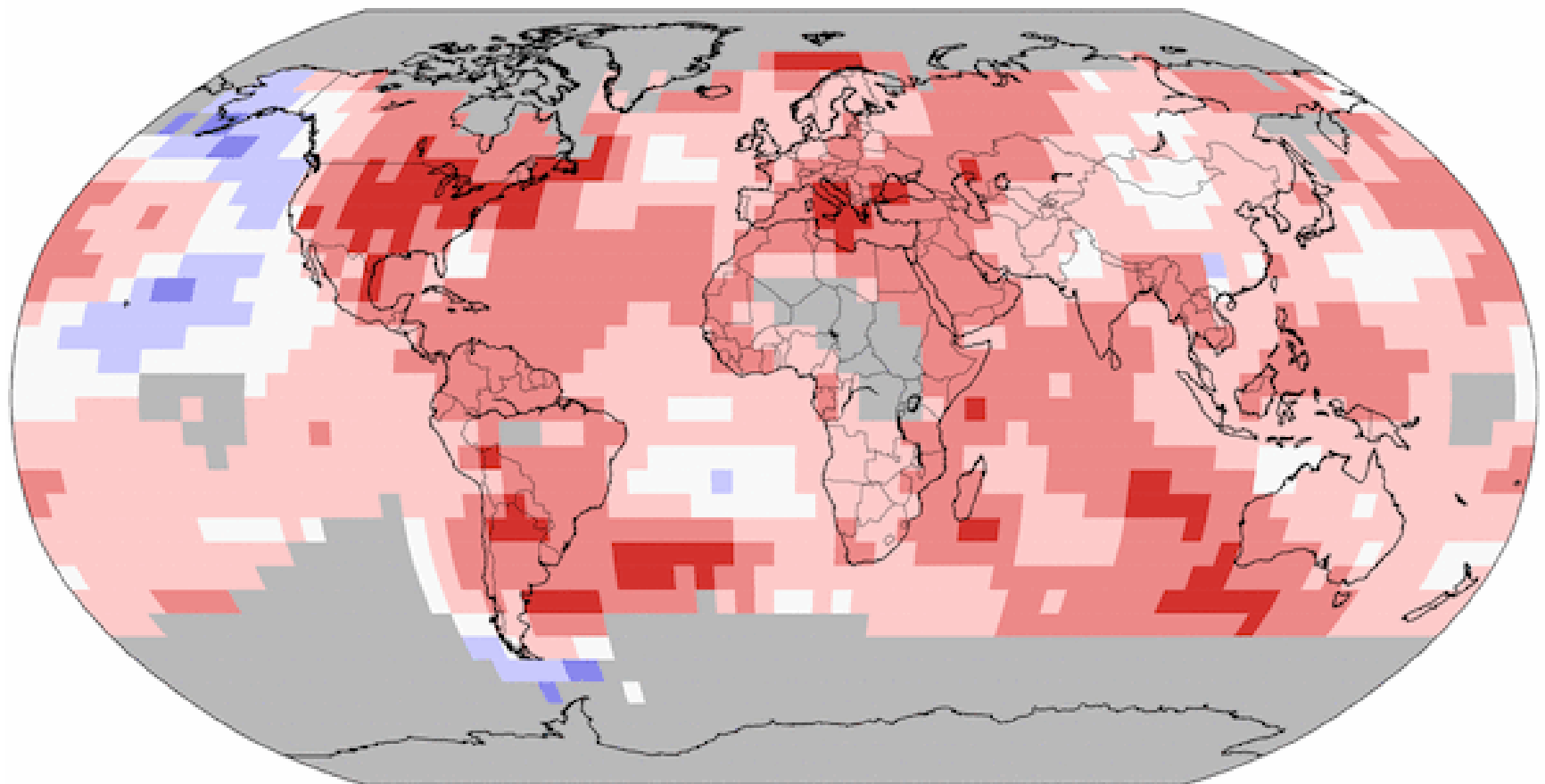


Sacramento Bee/Olivia Nguyen and Nathaniel Levine

Land & Ocean Temperature Percentiles Jan–Nov 2012

NOAA's National Climatic Data Center

Data Source: GHCN–M version 3.2.0 & ERSST version 3b



Record Coldest



Much Cooler than Average



Cooler than Average



Near Average



Warmer than Average



Much Warmer than Average



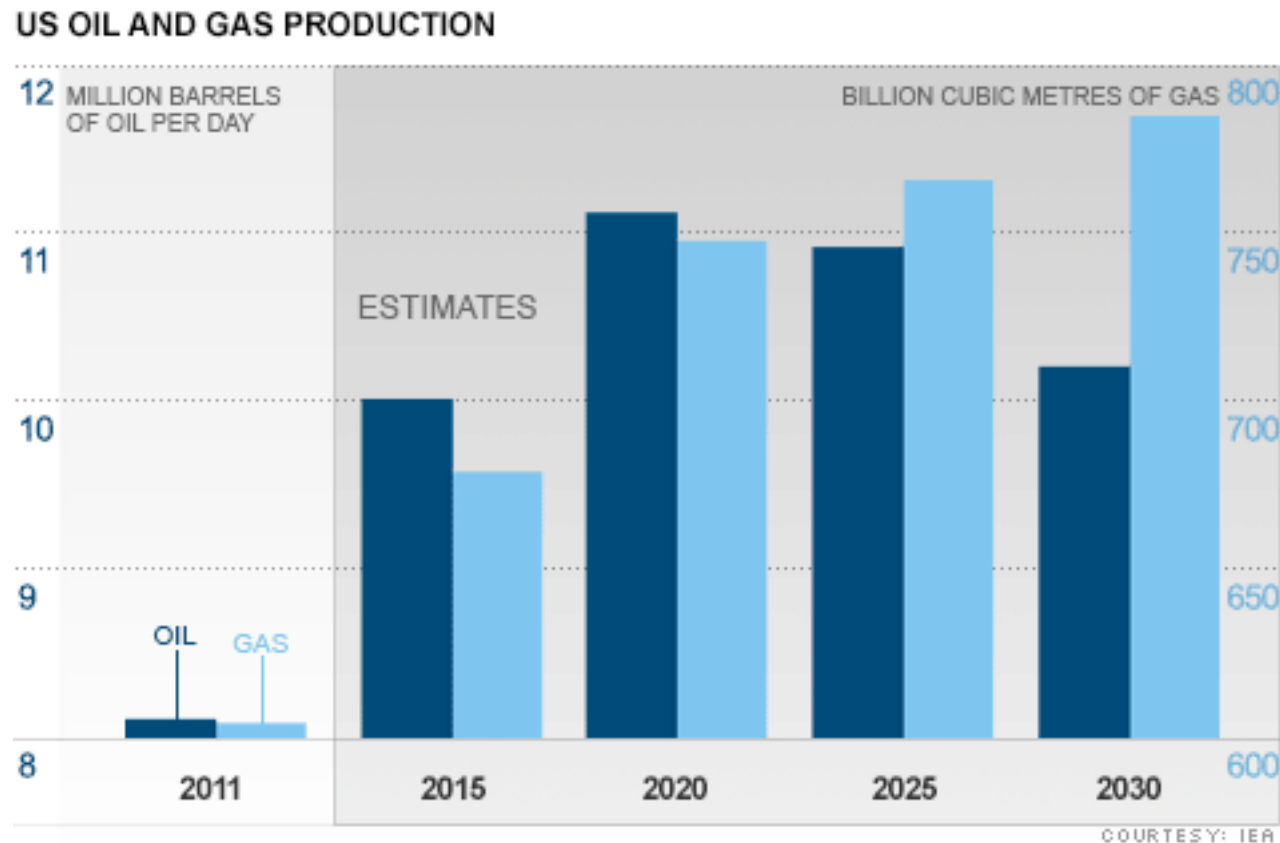
Record Warmest



U.S. to become biggest oil producer – IEA

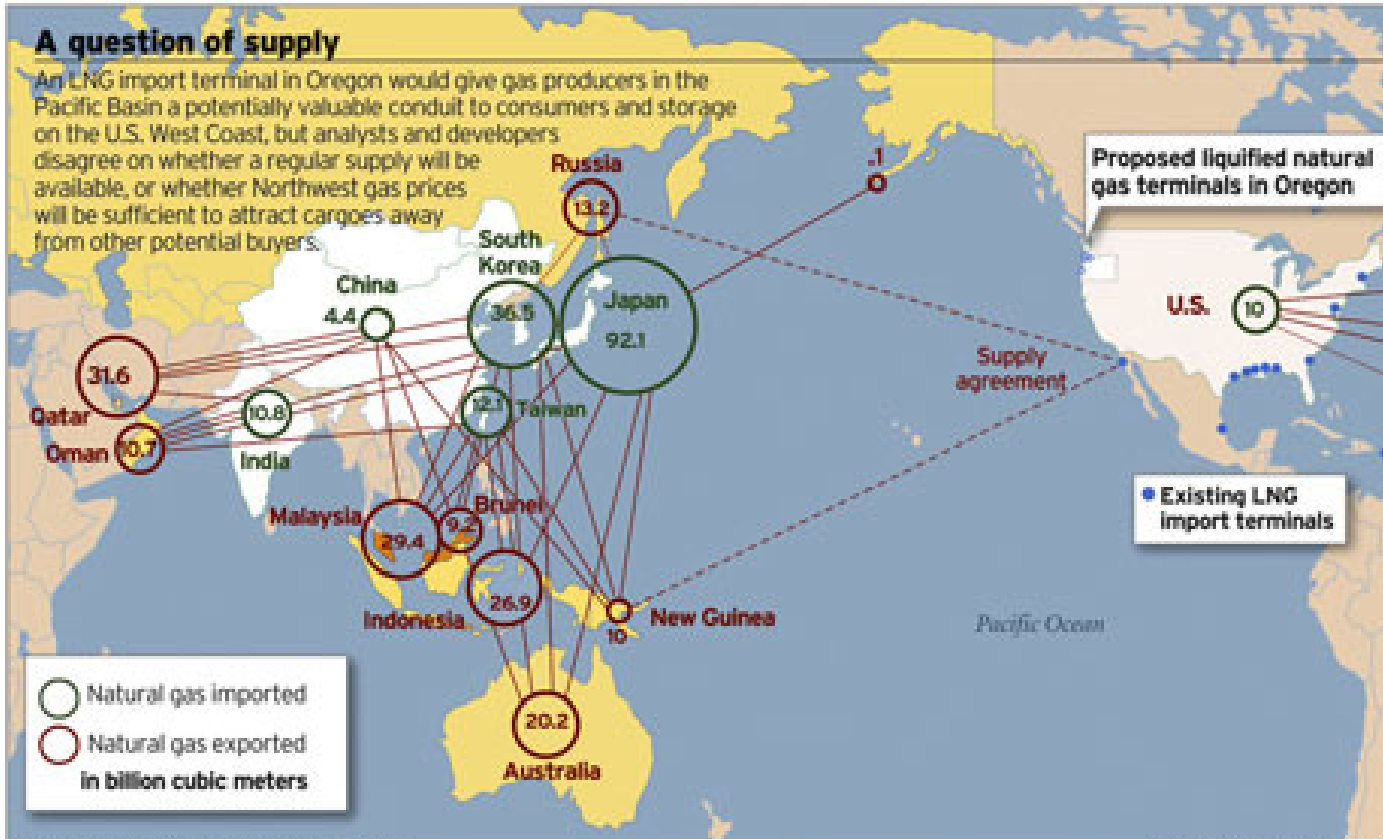
(Mark Thompson, November 12, 2012)

The claim: Oil and gas boom puts US on track for “energy independence”: but at what social and environmental costs?



Energy Supply to China

(2012)



The Green Economic Revolution is The Next Economics

**Vision: Controlling and Mitigating Climate Change
Economic Change through Innovation and Technology:
The Case of Energy**

- 1. Have an Energy Environmental Plan with built in financing mechanisms**
- 2. Efficient and Conservative energy use along with Renewable Energy through On-site power and Central Grid Generation forming Agile Systems**
- 3. Demand Side Management Performance and Power Contracts that are long-term and economical**
- 4. Green and Blue Tech for renewable energy systems such as solar, wind, ocean and wave power integrated with chemical, electronic and engineering technologies**
- 5. Smart Green Grid – central systems and on-site power**
- 6. National, regional, state and local plans integrated green technologies and provide financial support**
- 7. Sustainable Development and Education Cross-Disciplinary Curriculum – Including Science, Health, Medicine Social Studies, and Applied Fields in Infrastructures (water, waste, transportation, IT etc) with Archecuture, Design, Career Education, Training, Entrepreneurship and New Ventures.**
- 8. Global alliances including IP and Finance**

Smart-grid city

Smart-grid technology is designed to allow customers and utility companies to collaboratively manage power generation, delivery and energy consumption in real-time two-way communication.

Wireless sensors: Distributed throughout the grid to communicate with meters and power grid to determine outages and other problems and relay information to utility substation.

Tiered rates: Utilities can change rates based on demand, charging more for power during peak hours and less during nonpeak hours.

Smart house

Features digital meter, smart thermostat and other devices to allow customers to adjust their energy consumption according to preference and rates.

Solar panels: Excess power generated can be sent back to the grid.

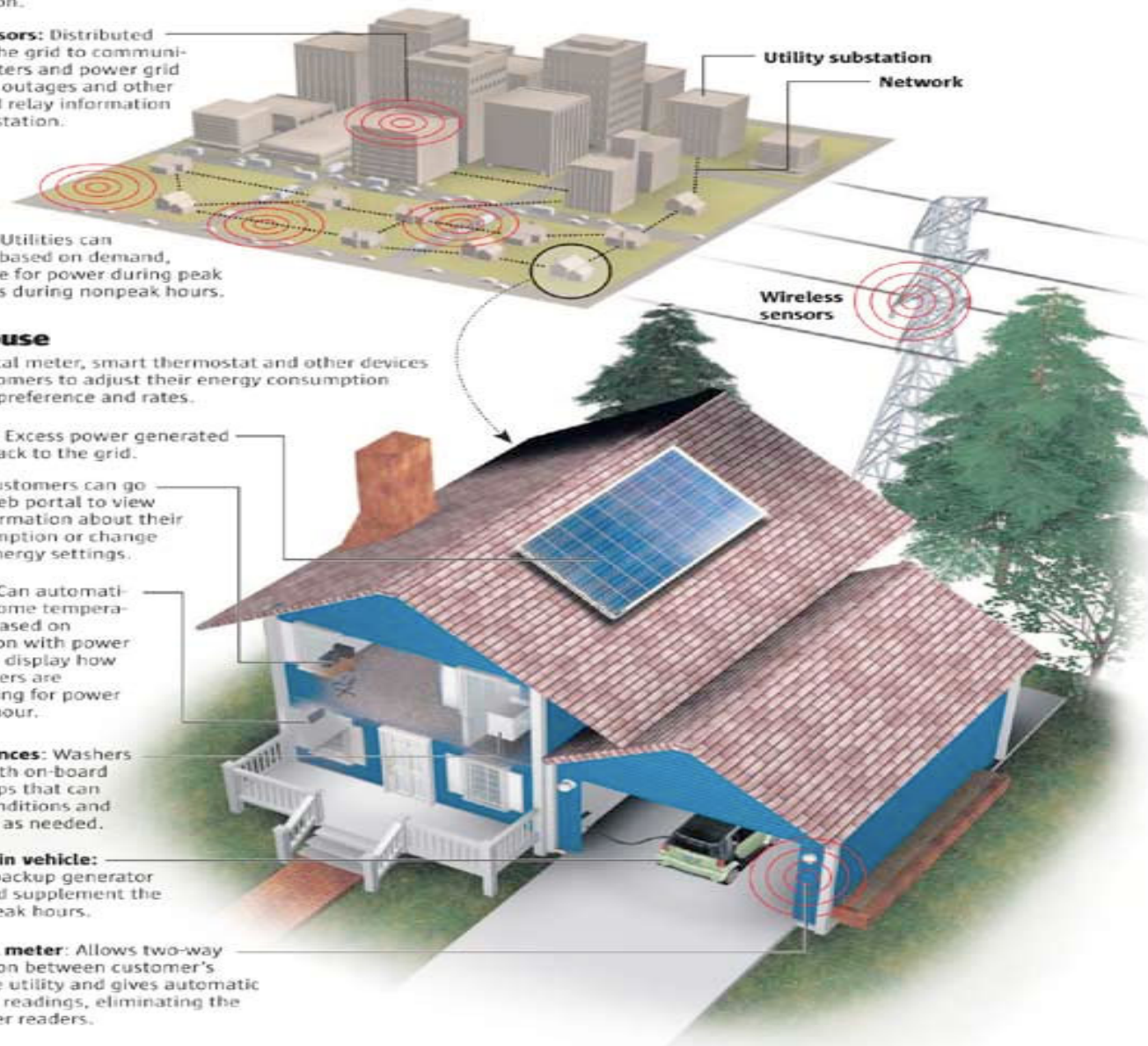
Computer: Customers can go online to a Web portal to view real-time information about their power consumption or change their home energy settings.

Thermostat: Can automatically adjust home temperature setting based on communication with power grid. Can also display how much customers are currently paying for power per kilowatt hour.

Smart appliances: Washers and dryers with on-board computer chips that can sense grid conditions and turn off or on as needed.

Electric plug-in vehicle: Can act as a backup generator for homes and supplement the grid during peak hours.

Smart digital meter: Allows two-way communication between customer's home and the utility and gives automatic energy usage readings, eliminating the need for meter readers.



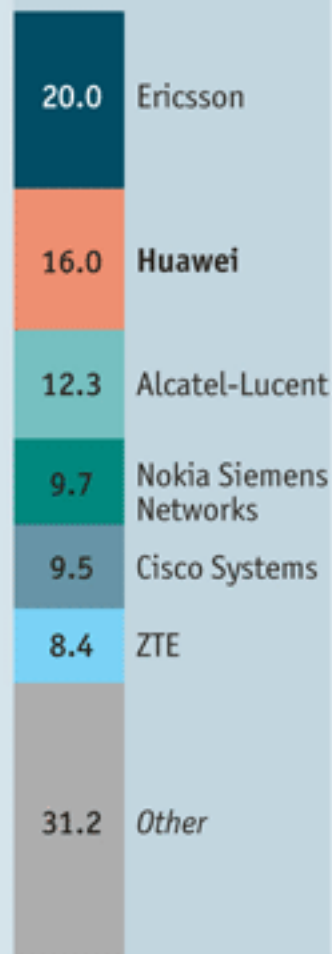
Social Capitalism at Work

(The Next Economics, Chapter #7: Clark and Li, 2012)

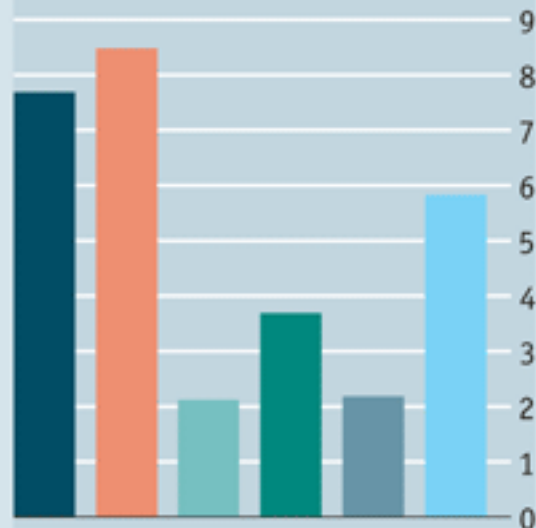
Unequal world

Telecoms-equipment revenues by region, 2011, \$bn

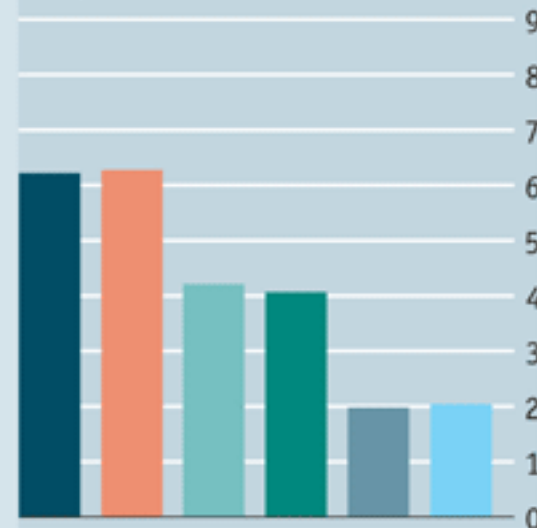
Worldwide



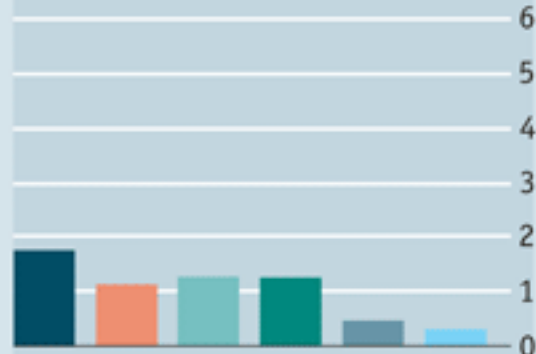
Asia-Pacific



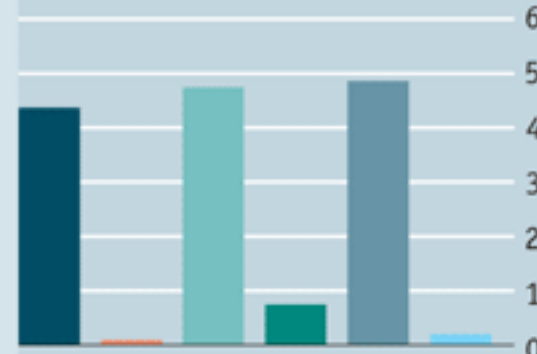
Europe, Middle East and Africa



Caribbean and Latin America



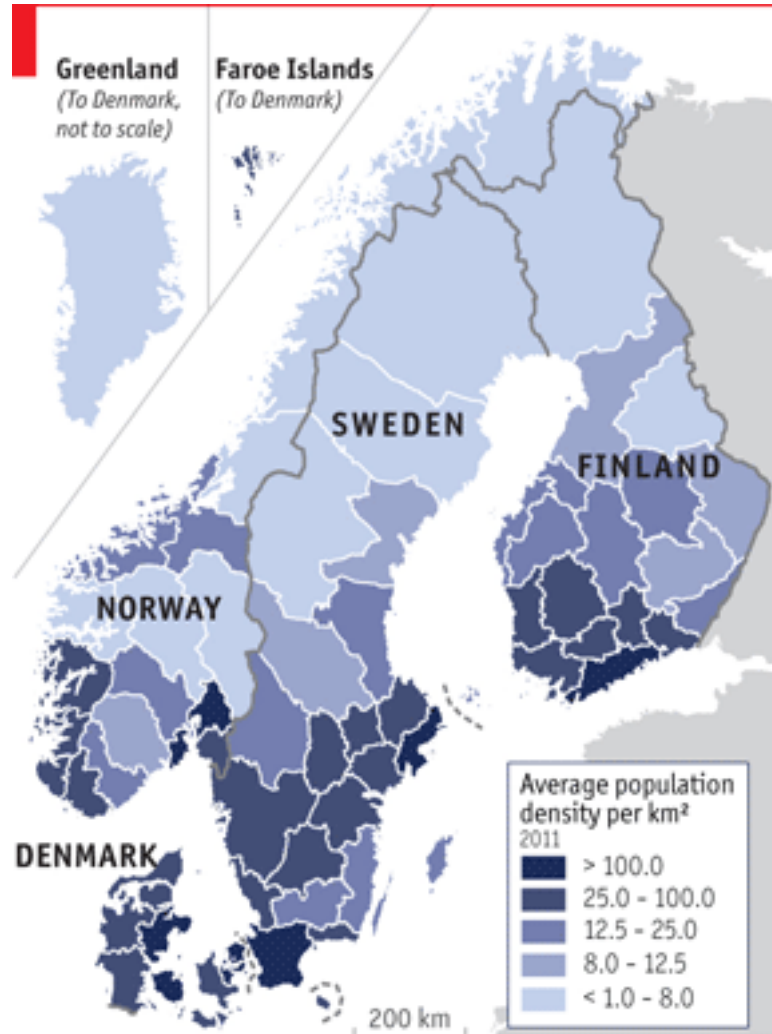
North America



Source: Analysys Mason

Northern Lights Special Issue

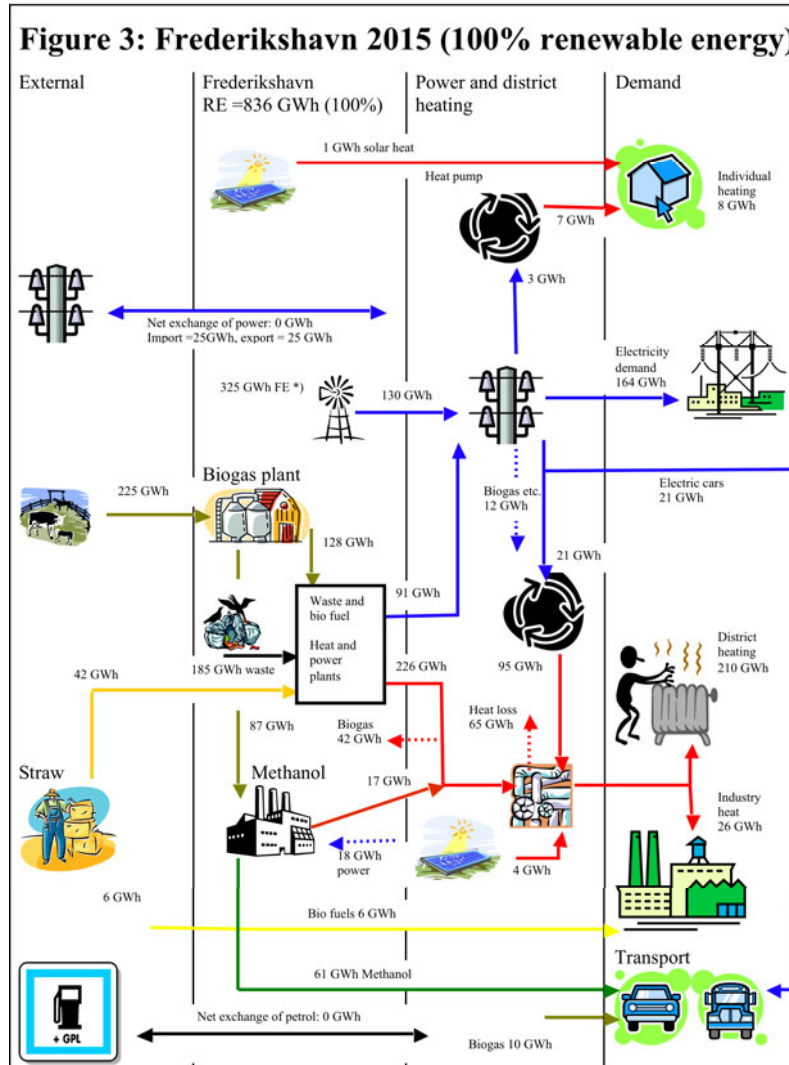
(Economist, 4 February 2013)



Sources: Nordregio & NLS Finland

Sustainable Communities: Chapter # 10: Frederickshavn, DK Energy Independent Plan, 2015

Electricidad distribuida



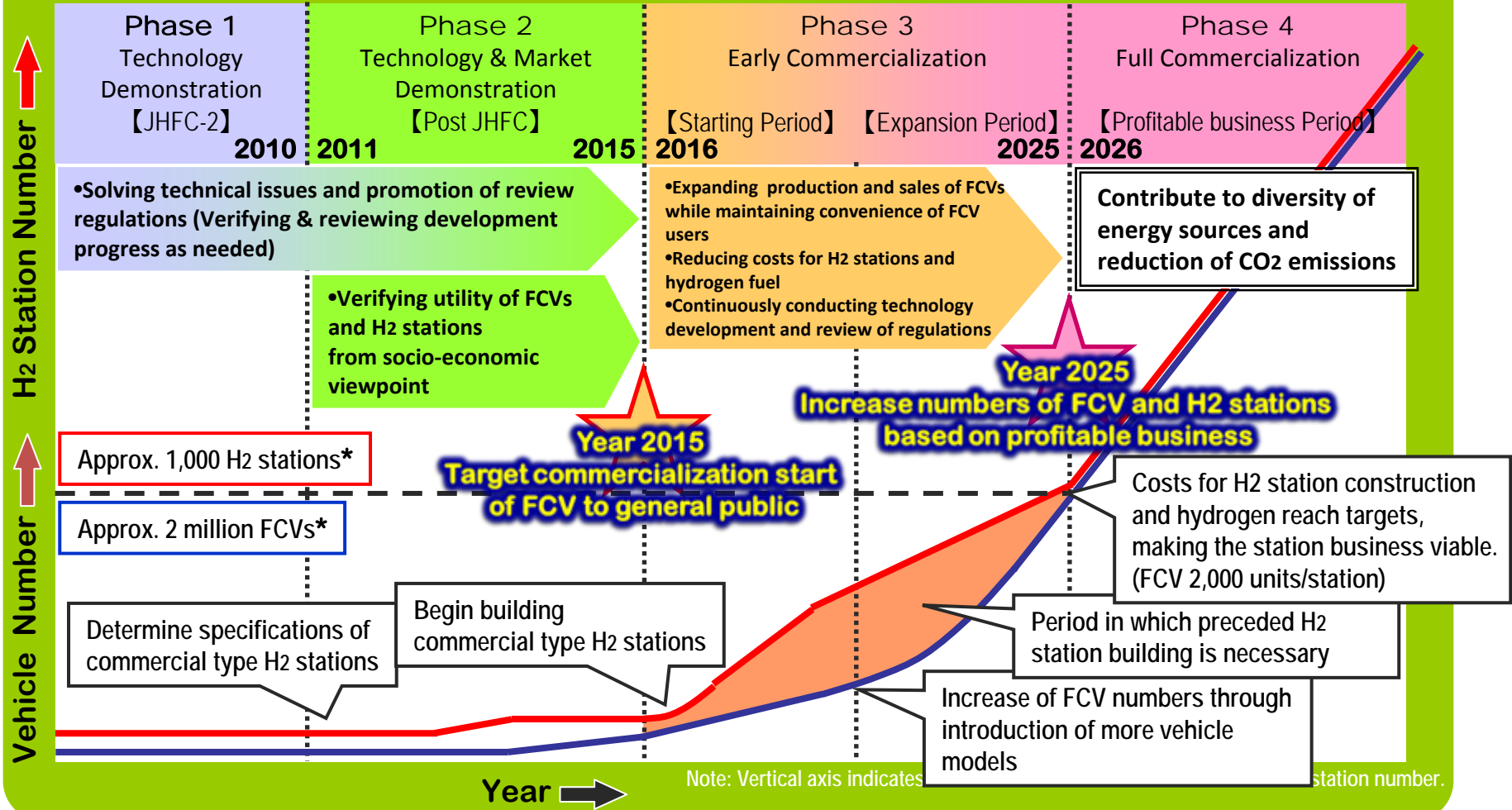
Ch # 11: Ota City Pal-Town Josai-no-mori



Honda Clarity: H2 Fuel Cell Car

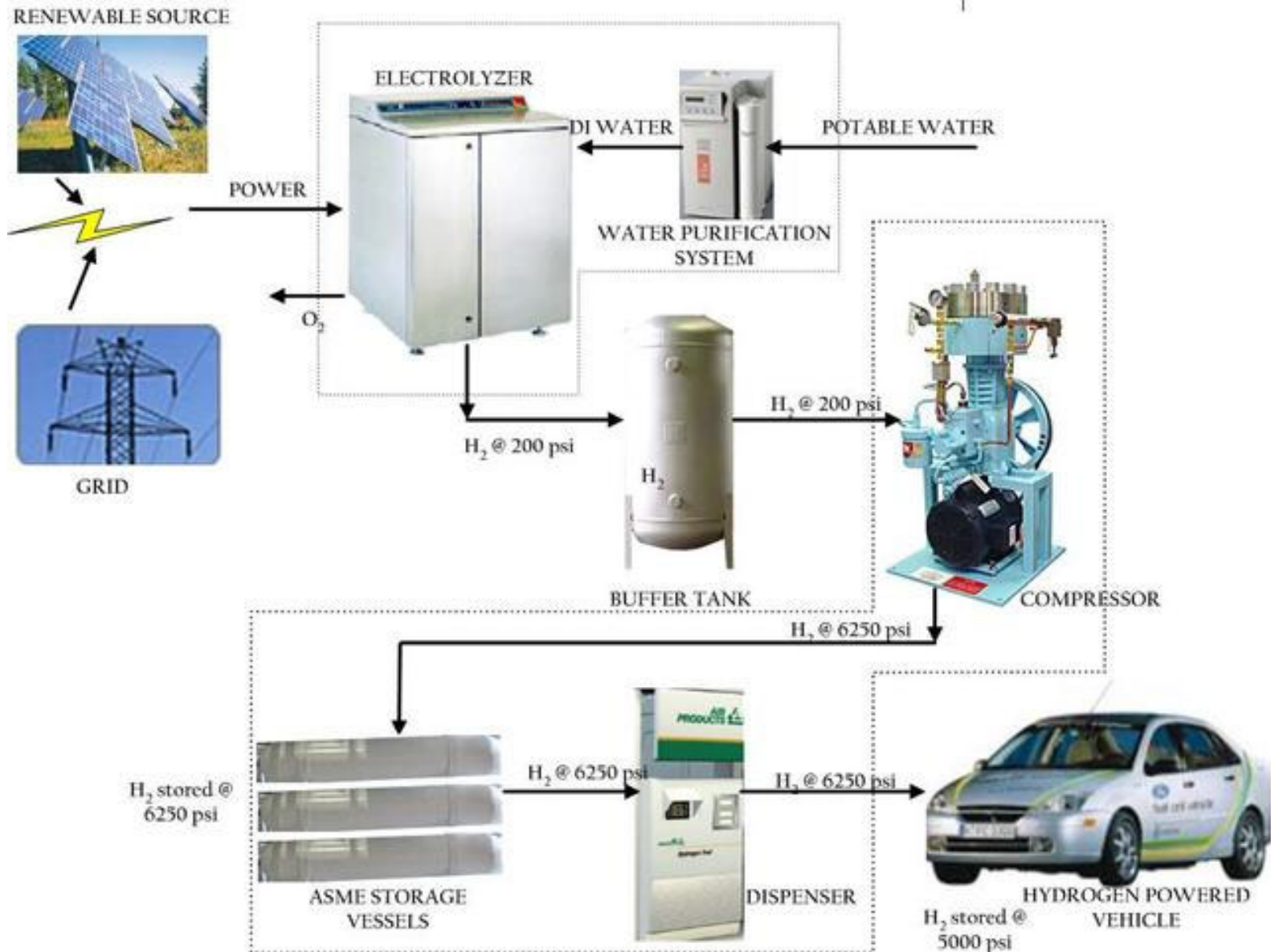


Commercialization Scenario for FCVs and H2 Stations



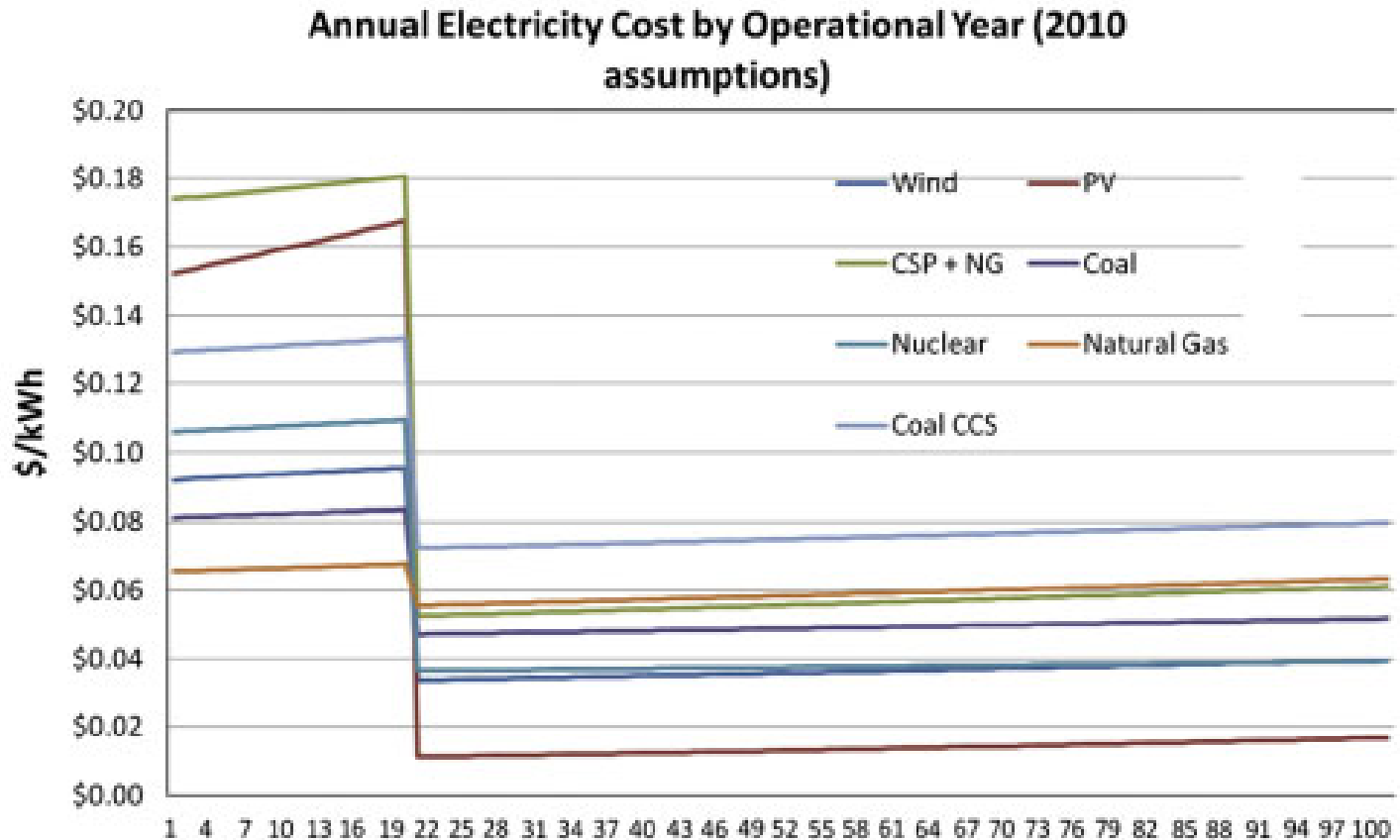
* Precondition: Benefit for FCV users (price/convenience etc.) are secured, and FCVs are widely and smoothly deployed

Renewable Hydrogen Station

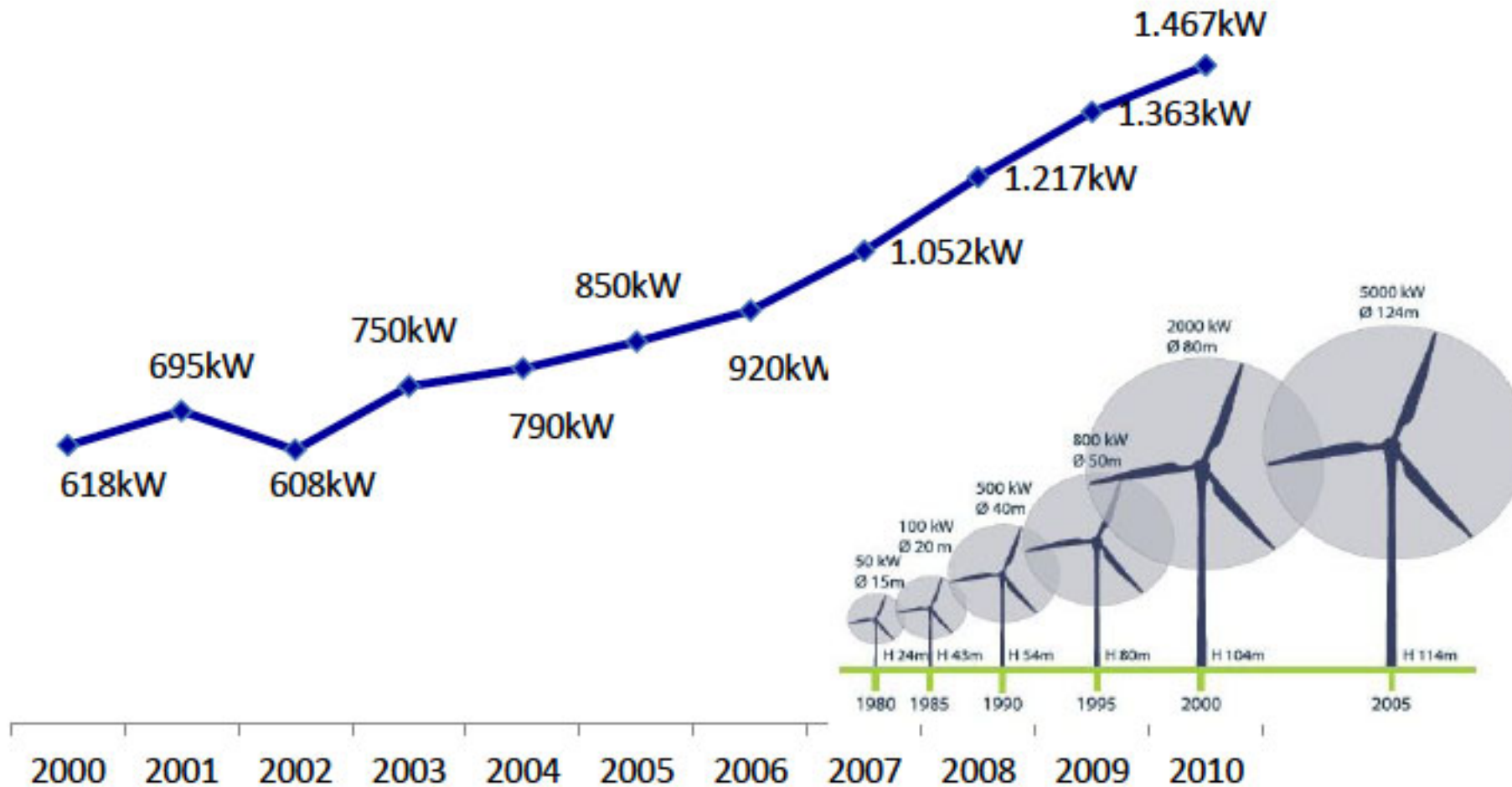


Solar is about to change our World

(Michael Sankowski, 18 April 2013)



Average Size of Wind Turbines

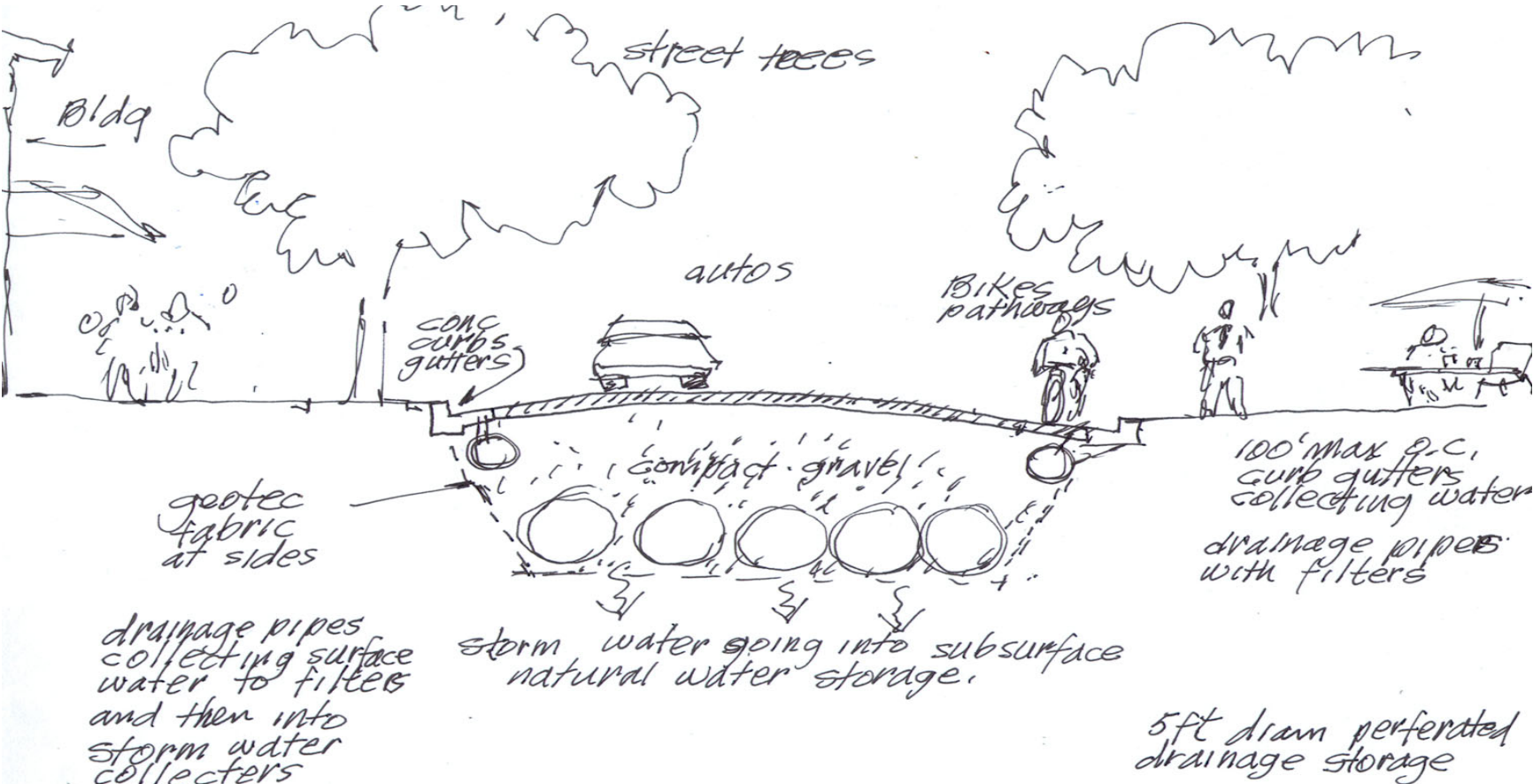


Development Phases of Renewable Energy Technologies



Renewables	R&D	Demonstration	Early commercialized	Commercialized
Hydro				Commercialized
Small-scale biomass gasification				Commercialized
Biomass IGCC	R&D			
Biogas power generation		Demonstration		
Biofuel production		Demonstration		
Onshore wind				Commercialized
Offshore wind			Early commercialized	
Solar water heater				Commercialized
PV			Early commercialized	
CSP		Demonstration		
Geothermal heating				Commercialized
Geothermal power generation		Demonstration		
Tidal		Demonstration		
Wave	R&D			

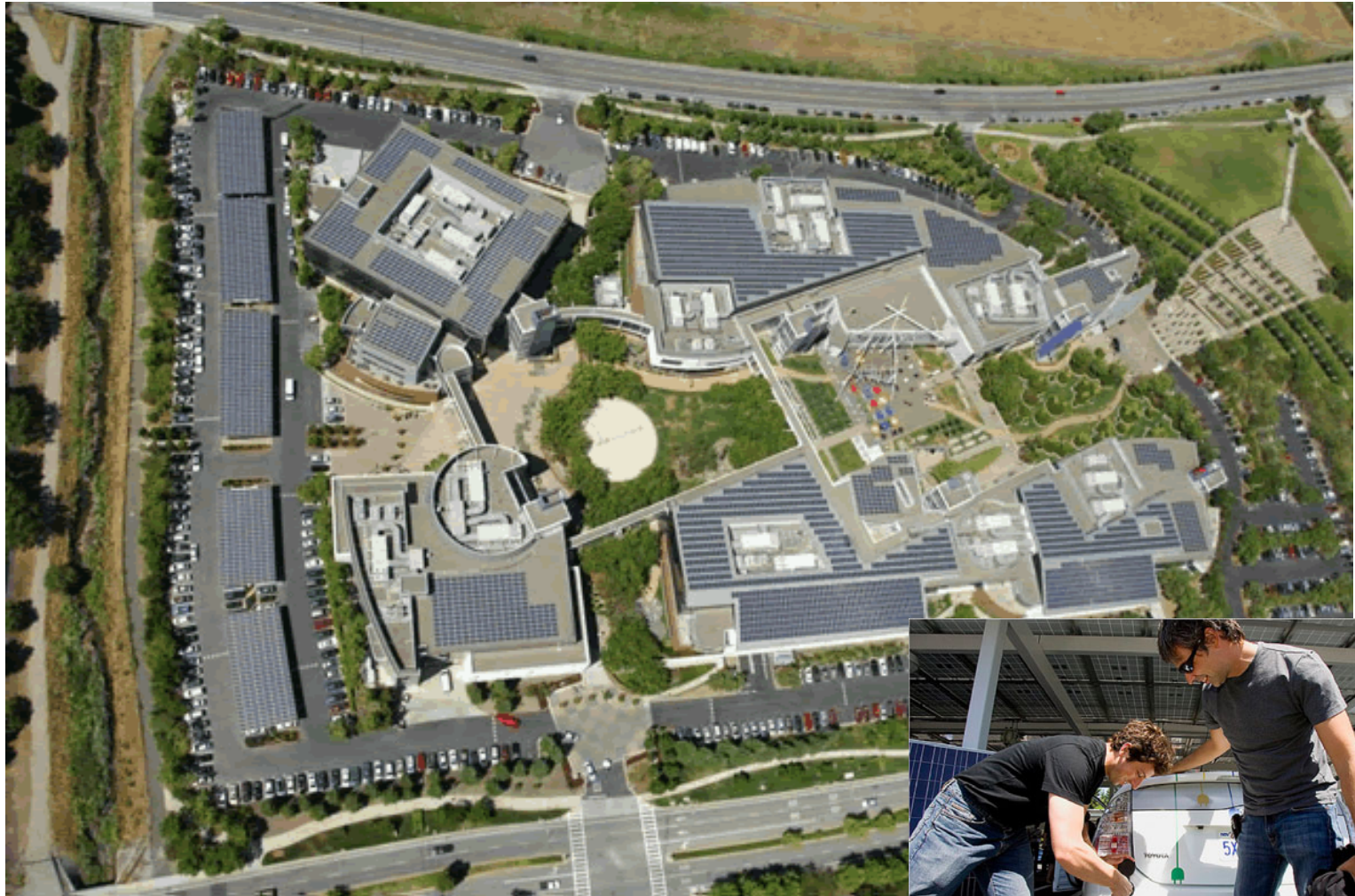
Sustainable Communities (Springer Press, 2009) Chapter #4: Sustainable Community Design



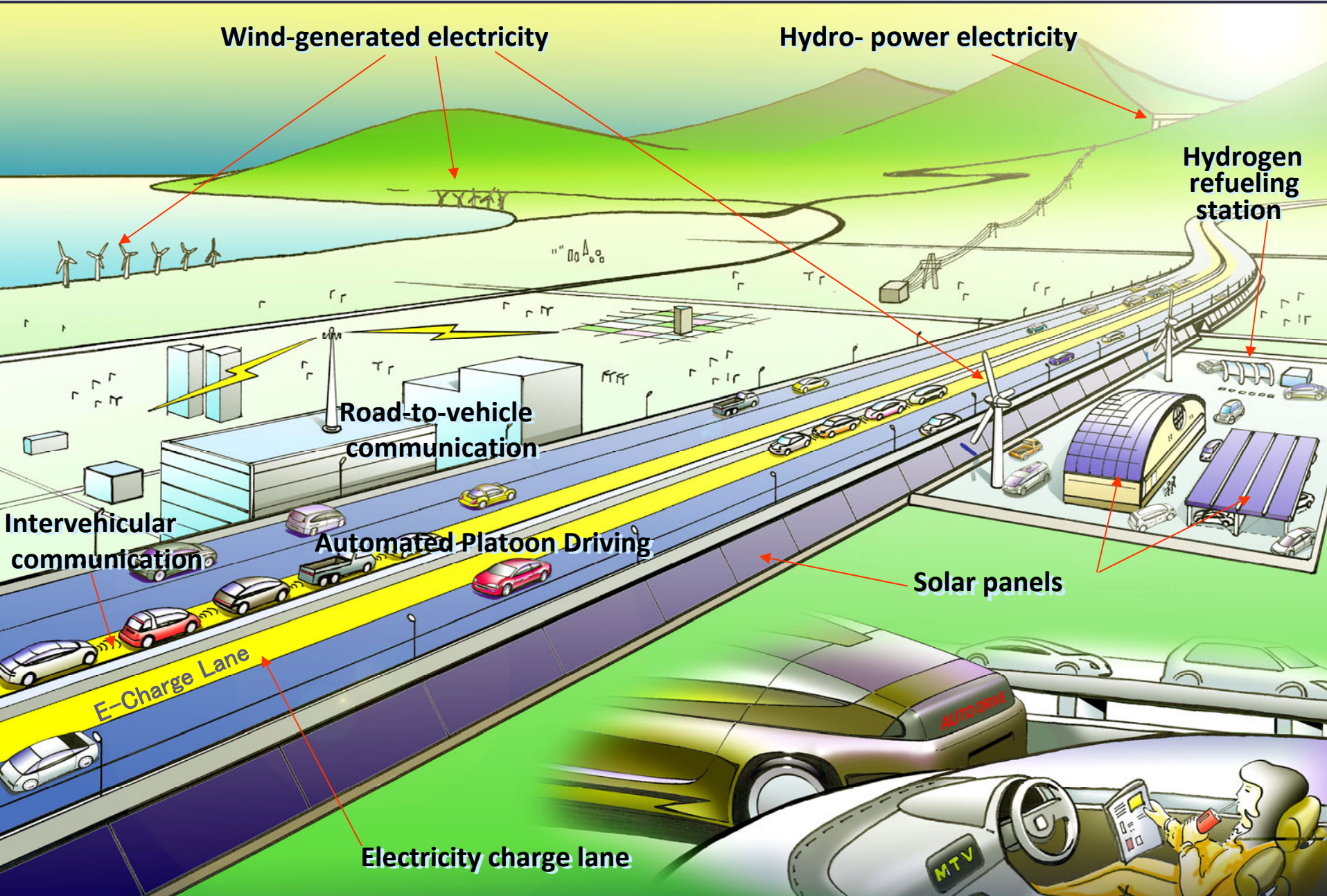
STREET SECTION @ smaller streets

2nd Eco-Charrette
09.17.08

Sustainable Communities (Springer Press, 2009) Ch # 8: Google Sharp (1.6MW) Solar Campus: Goal: carbon neutral by end of 07



A Vision of Future Sustainable Mobility



Wind-generated electricity

Hydro-power electricity

Hydrogen refueling station

Road-to-vehicle communication

Intervehicular communication

Automated Platoon Driving

Solar panels

E-Charge Lane

Electricity charge lane

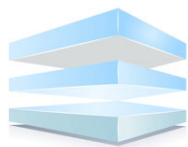
AUTO DRIVE

MTV



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