

Open Energy System Symposium: Diverging Issues, One Solution

Hiroaki Kitano



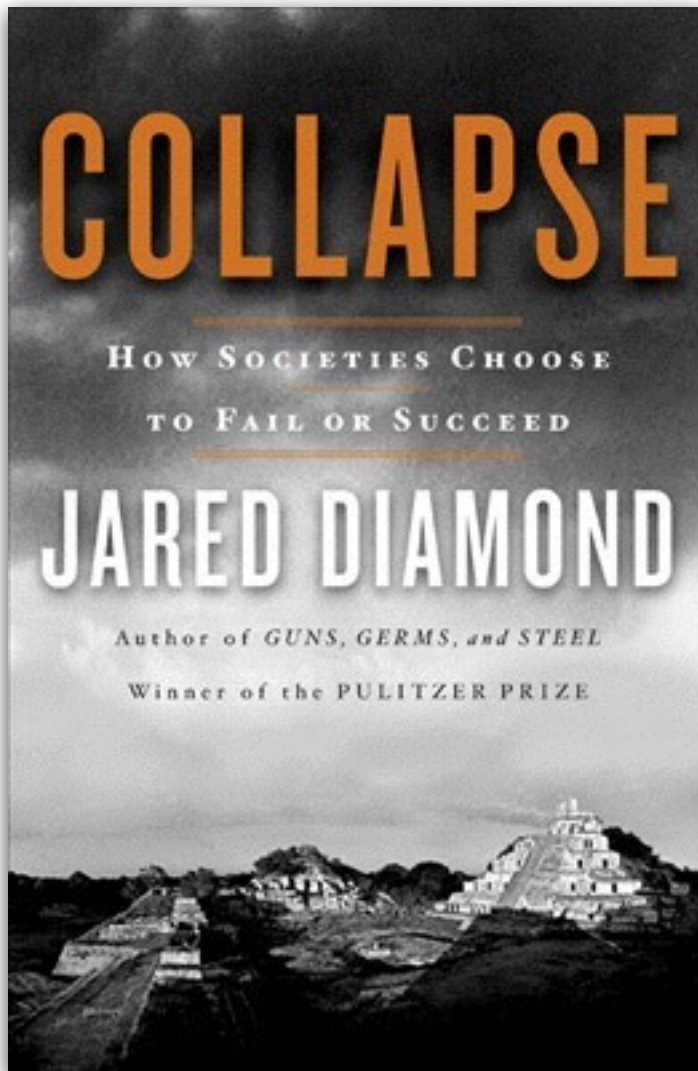
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INTERGOVERNMENTAL PANEL ON climate change

CLIMATE CHANGE 2013

The Physical Science Basis

Summary for Policymakers



“...population and environmental problems created by non-sustainable resource use will ultimately get solved in one way or another: if not by pleasant means of our own choice, then by unpleasant and unchosen means...” Jared Diamond

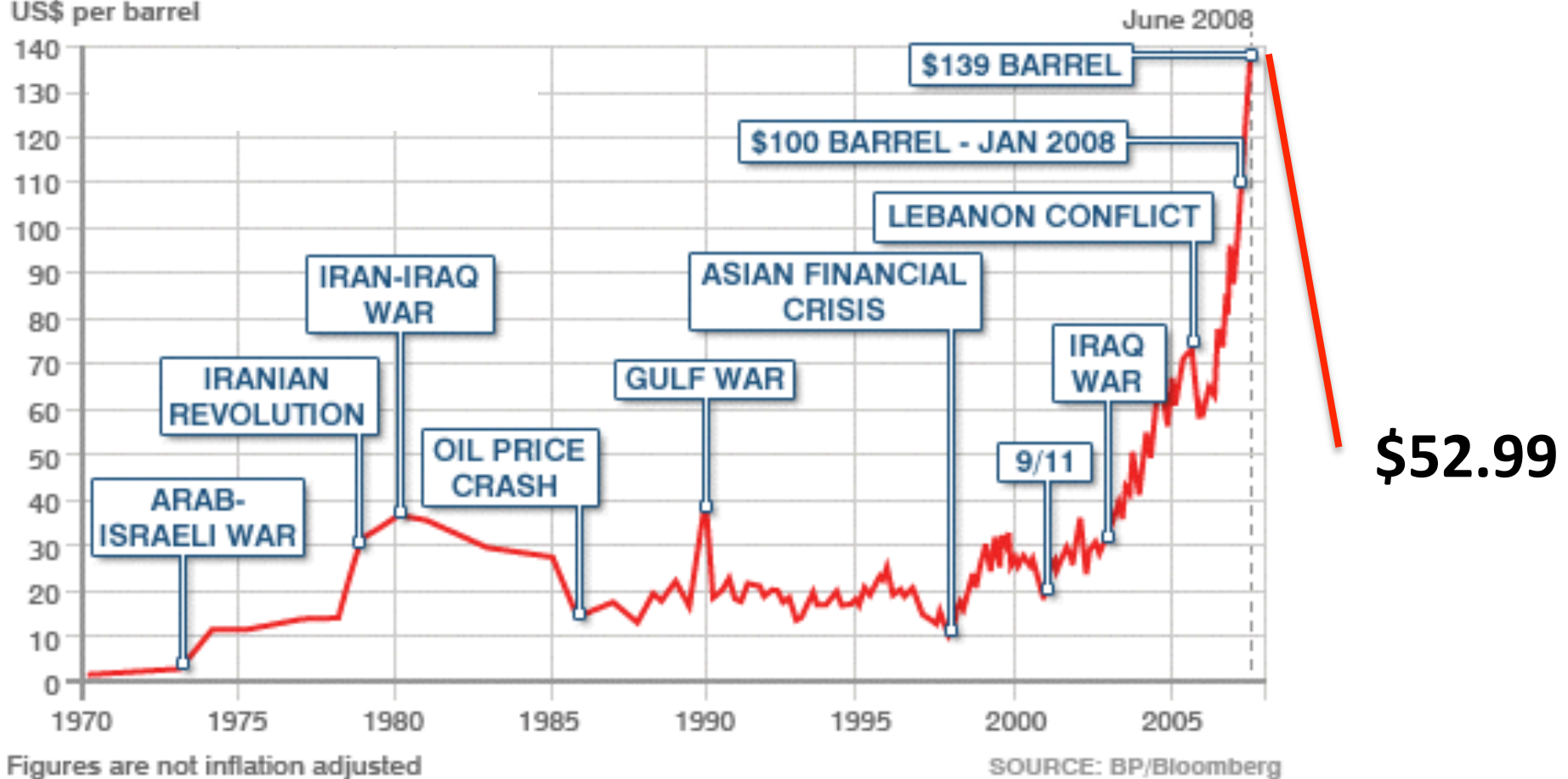


Geopolitical Risk



CRUDE OIL PRICES 1970-2008

US\$ per barrel



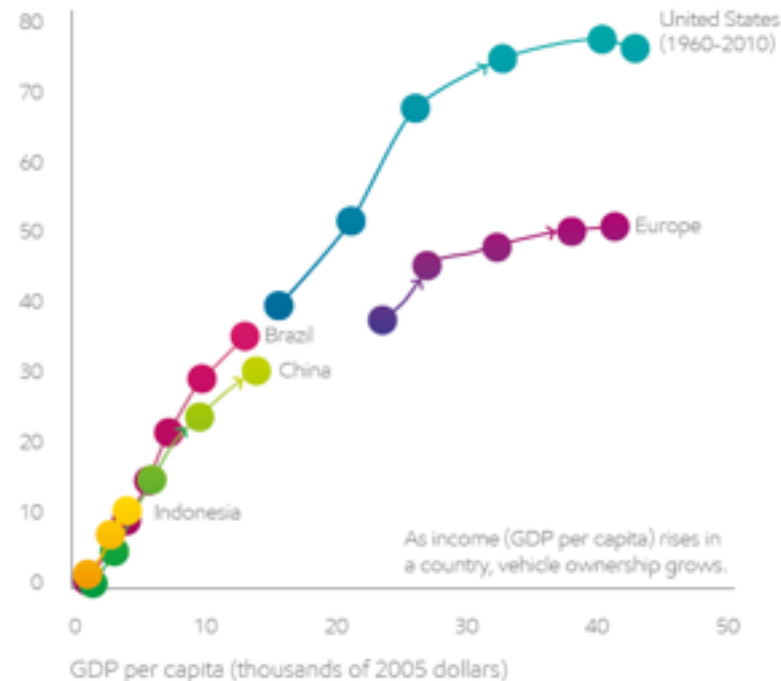
Innovations are Reshaping Global Energy Landscape



Increasing vehicle penetration and improving fuel efficiency

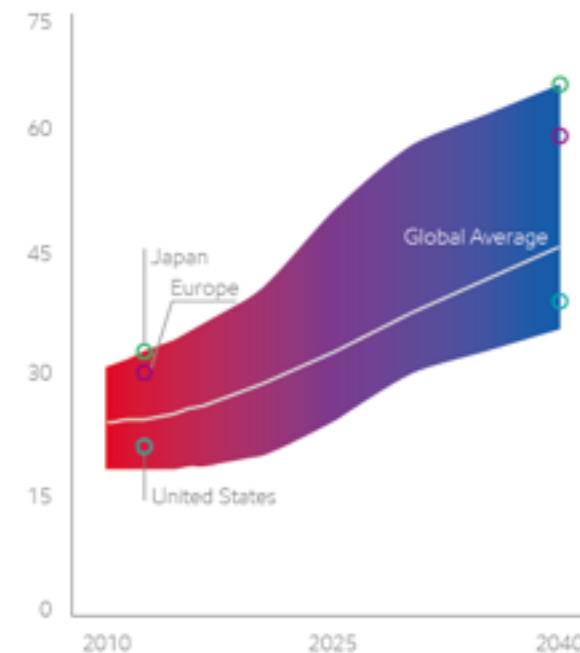
Vehicle penetration 2000 to 2040

Cars per 100 people



Range of average vehicle efficiency

On-road miles per gallon



Exxon Mobile, The Outlook for Energy: A View to 2040, (2014)

Oil's shale shake-up

Growth in US shale oil production and 100 years of natural gas resources are driving hopes of complete energy independence for the USA and fears of a correction in medium-term oil prices. We question this simplistic assessment.

Jan Stuart, Edward Westlake

US energy independence and global tension



Modernizing Energy Services for the Poor: A World Bank Investment Review – Fiscal 2000–08

December 2010

Douglas F. Barnes
Bipul Singh
Xiaoyu Shi

Energy Services for the Millennium Development Goals



Achieving the Millennium Development Goals

MillenniumProject
Initiative for the Millennium Development Goals



ESMAP
Energy Sector Management
Assistance Programme

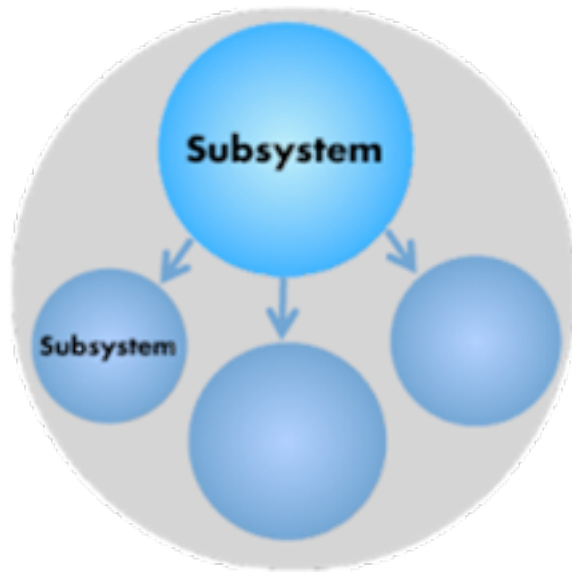


3 hours of electricity may change
their life

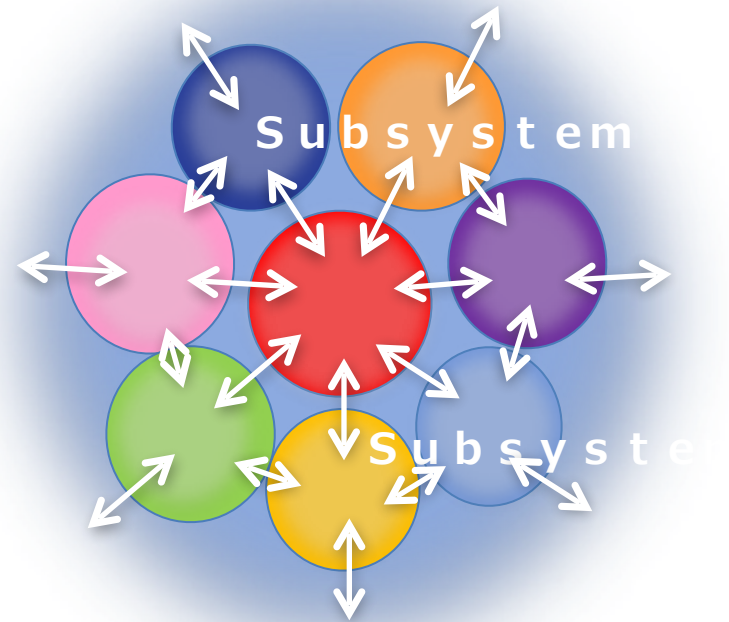


UN Millenium Development Goal

Open Energy System



Closed System
Current system



Open System
Future system

**Economic growth
and development**
(including electricity cost)

Outcomes

Energy security
(including reliability)

**Environmental
sustainability**

Industry Agenda

The Future of Electricity

Attracting investment to build tomorrow's electricity sector

In collaboration with Bain & Company

January 2015



SOFT ENERGY PATHS

TOWARD A DURABLE PEACE

AMORY B. LOVINS



HARPER



COLOPHON BOOKS / CN 653 / \$4.95



SMART GRID

Digital and communications devices installed throughout a power system can track usage and minimize and manage disruptions.


- Communication
- Power lines




We go extreme

M6 go

Consumer Generated Energy

- Paradigm change in energy system
 - status quo: power company to provide electricity
- 
- Future: everyone generates and distribute electricity

Mega-Transformation

- TV station and movie companies create contents and distribute
- 
- YouTube etc: anyone creates and distributes contents



facebook

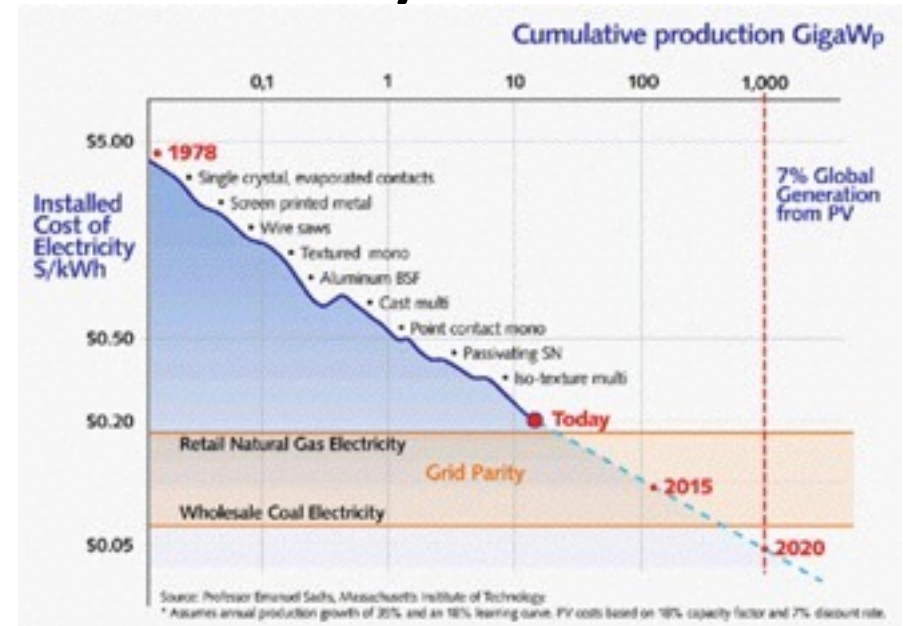
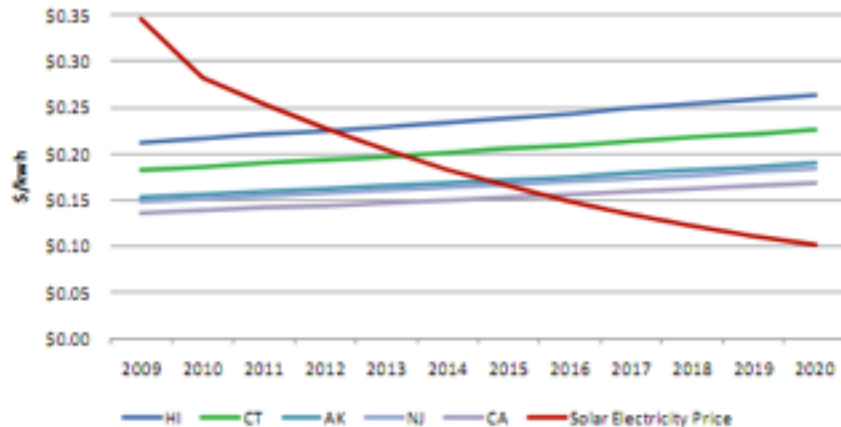
- Hotel and Taxi companies provide services
- 
- AirBnB, Uber, etc: anyone provide services



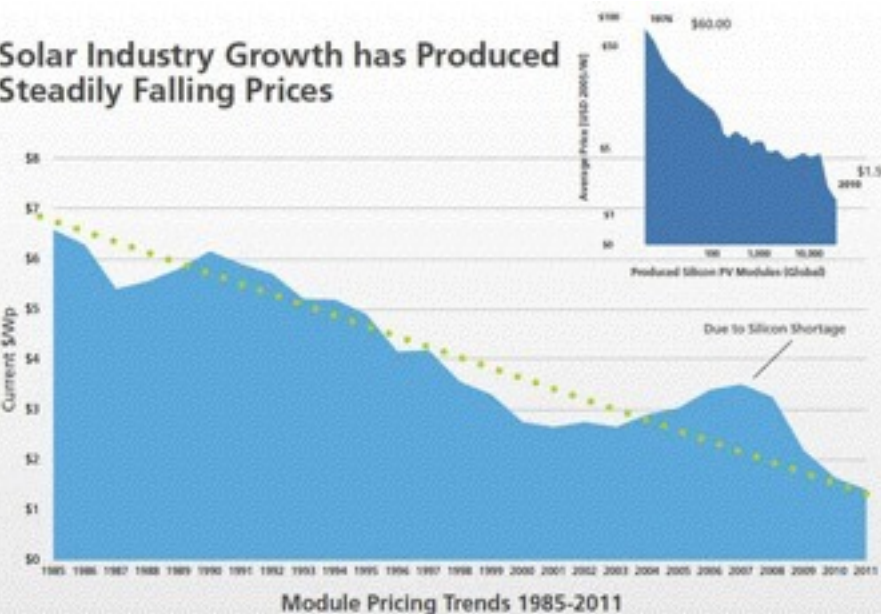
U B E R

Reaching Grid Parity

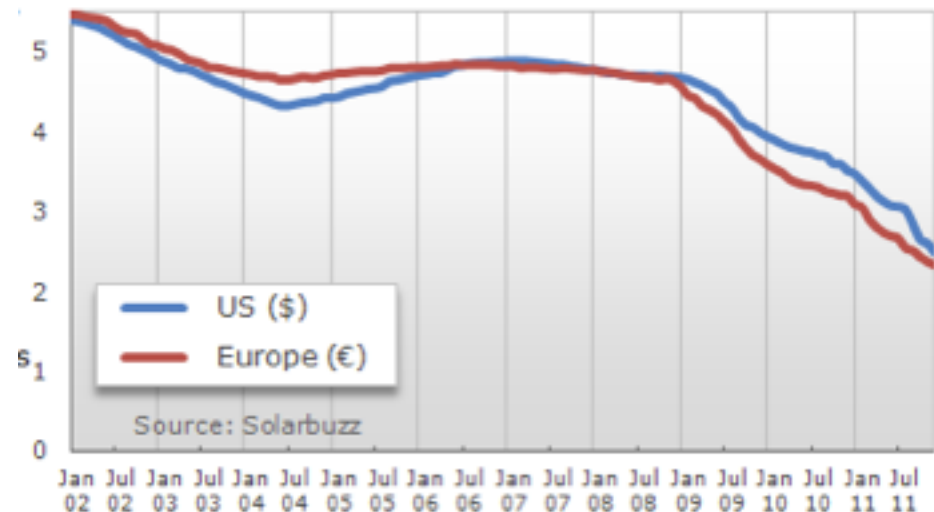
US GRID PARITY PROJECTION FOR KEY STATES



Solar Industry Growth has Produced Steadily Falling Prices



Solarbuzz Retail Module Price Index
Dec 2001: \$5.40 €5.47 — Nov 2011: \$2.49 €2.33
Price per Watt Peak



Future Grid Forum: Change and Choice

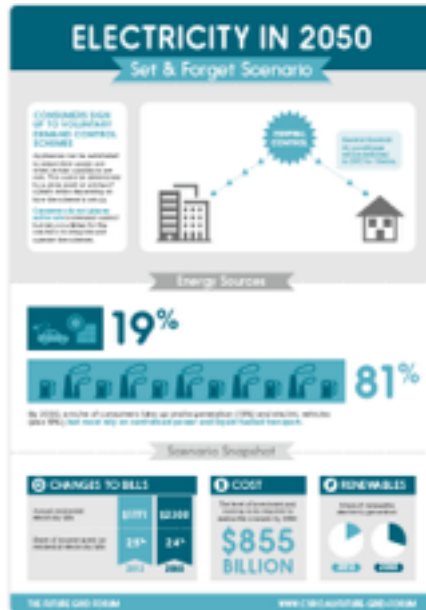
CSIRO, Australia

Set & Forget

Rise of the Prosumer

Leaving the Grid

Renewable Thrive



1/3 of consumers leave the grid

Global Agenda Council on New Energy Architecture

Leap Frog Strategy,
Battery-Centered Distributed Grid &
Deep Demand Management



Summit on the Global Agenda 2012

Dubai, United Arab Emirates 12-14 November

WORLD
ECONOMIC
FORUM

COMMITTED TO
IMPROVING THE STATE
OF THE WORLD



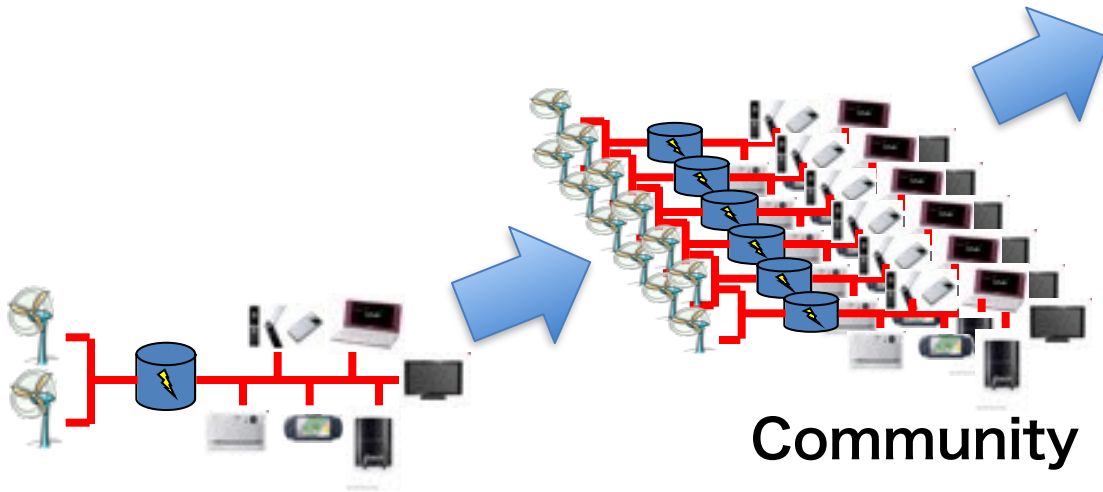
Milestones of Open Energy System

IAEA forecast of electricity demands in 2030:
31,524 TWh (20,037 TWh as of 2010)

US\$ 10 Trillion cumulative investment
+
US \$6Trillion / year (\$0.2 = 1kW) electricity sales

**Energy Cloud at
market scale**

W9LK6J 2C9IG



Community

Stand Alone

OIST as a global hub of Open Energy Systems research and industrial development





We are on inflection point



Deployment strategy
Alliance formation
Action plans

