

# APERC Annual Conference 2015

9th of June, 2015

Morning session

Energy Demand and Supply S1-1-5

## Exploring Drivers behind Outlooks

Masahiro Kakuwa

Chief Economist, Showa Shell Sekiyu  
Visiting Professor University of Tokyo

# Today's Talk

## 1. Introduction

Econo-energo-metric model

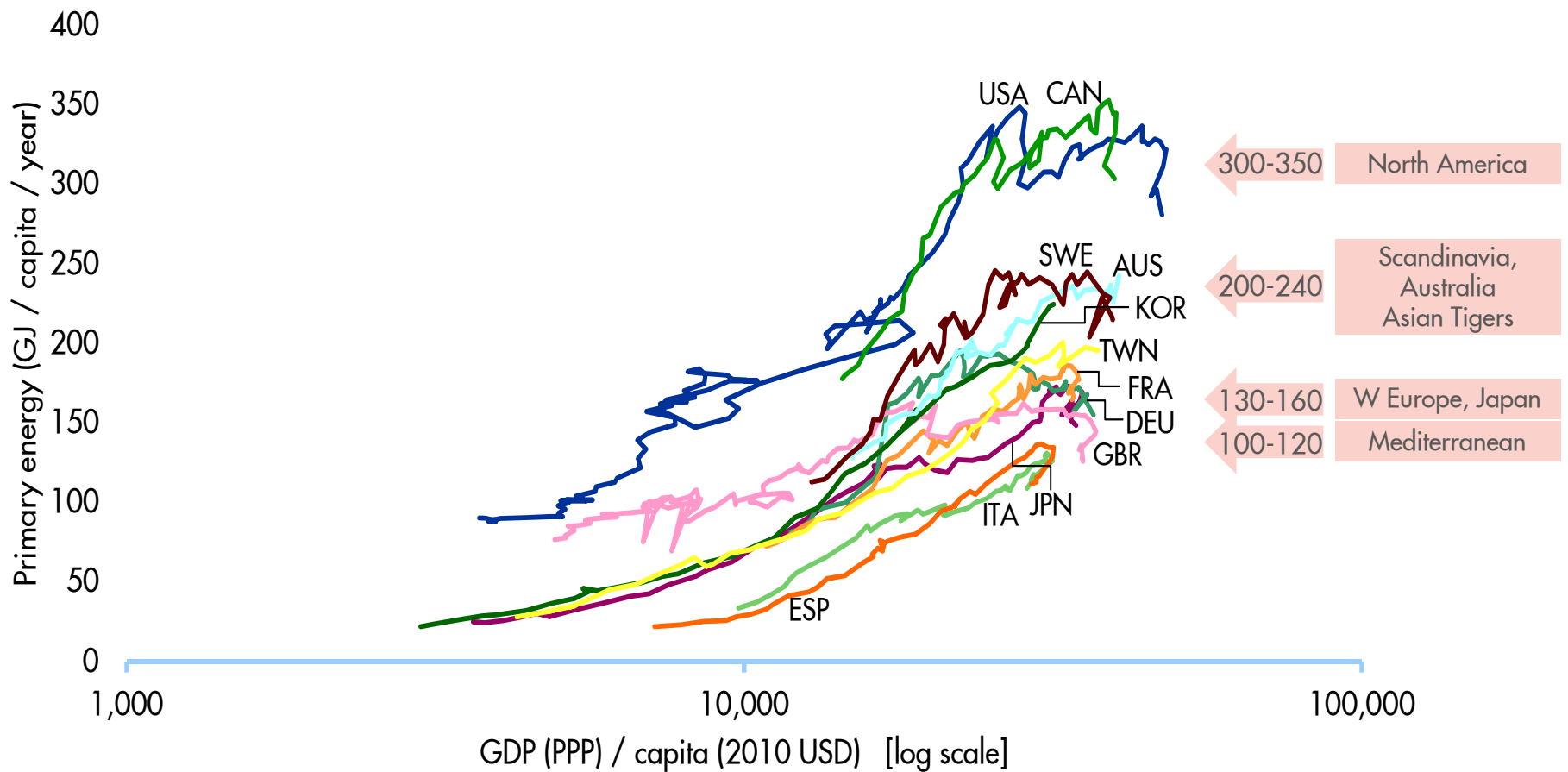
Normative modeling

Scenario planning

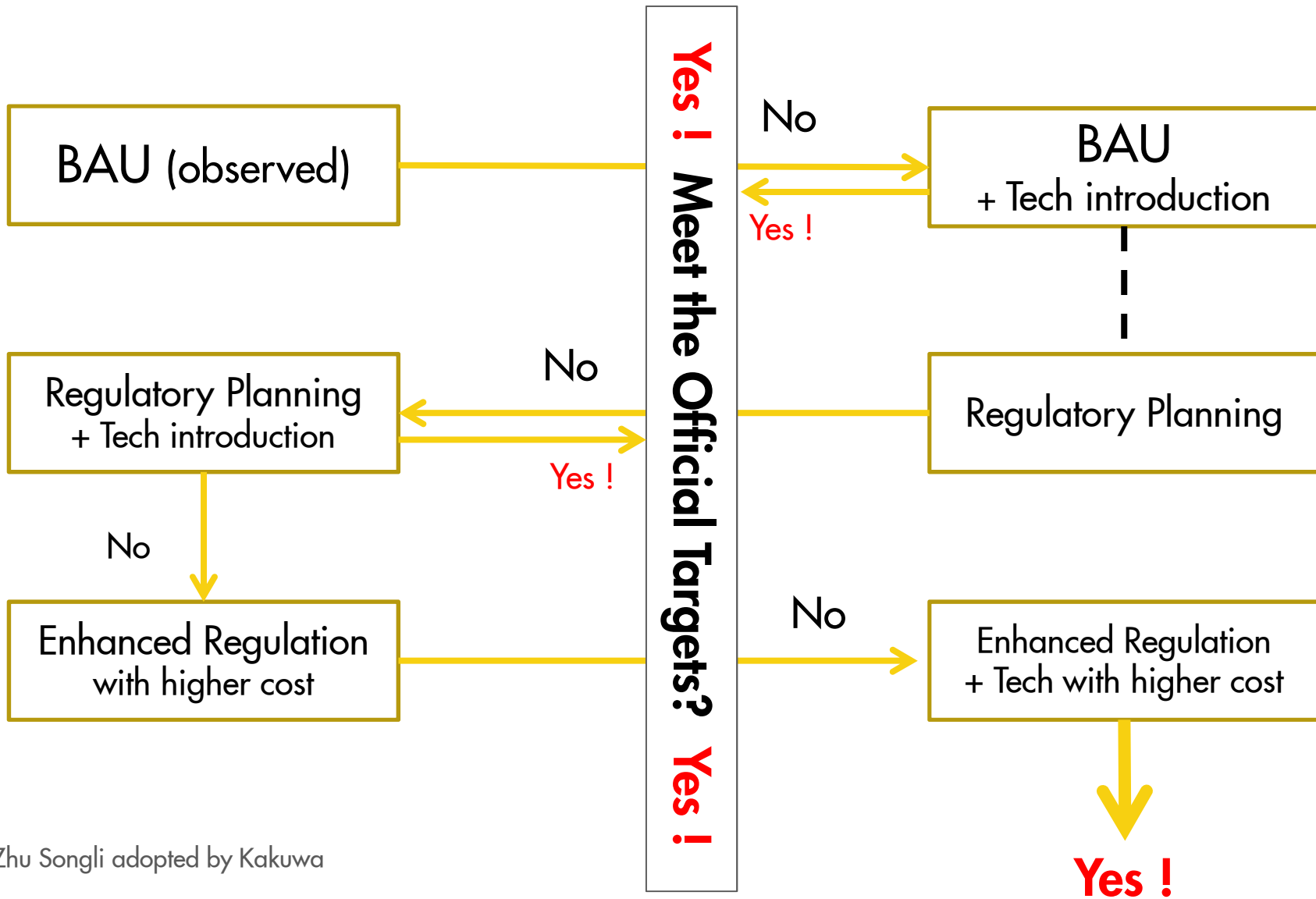
## 2. R.D.Shell New Lens Scenarios, 2013

# The inexorable link: economic growth and energy demand

## The Energy Ladder, 1960 - 2012 \*



# Government-led, normative modeling





# NEW LENS SCENARIOS

2013

# DISCLAIMER

This scenarios presentation contains forward-looking statements that may affect Shell's financial condition, results of operations, and businesses of Royal Dutch Shell. All statements other than statements of historical fact are, or may be deemed to be, forward-looking statements. Forward-looking statements are statements of future expectations that are based on management's current expectations and assumptions and involve known and unknown risks and uncertainties that could cause actual results, performance or events to differ materially from those expressed or implied in these statements.

Forward-looking statements include, among other things, statements concerning the potential exposure of Royal Dutch Shell to market risks and statements expressing management's expectations, beliefs, estimates, forecasts, projections, and assumptions. These forward-looking statements are identified by their use of terms and phrases such as "anticipate", "believe", "could", "estimate", "expect", "goals", "intend", "may", "objectives", "outlook", "plan", "probably", "project", "risks", "seek", "should", "target", "will", and similar terms and phrases. There are a number of factors that could affect the future operations of Royal Dutch Shell and could cause those results to differ materially from those expressed in the forward-looking statements included in this scenarios book, including (without limitation): (a) price fluctuations in crude oil and natural gas; (b) changes in demand for Shell's products; (c) currency fluctuations; (d) drilling and production results; (e) reserves estimates; (f) loss of market share and industry competition; (g) environmental and physical risks; (h) risks associated with the identification of suitable

potential acquisition properties and targets, and successful negotiation and completion of such transactions; (i) the risk of doing business in developing countries and countries subject to international sanctions; (j) legislative, fiscal, and regulatory developments including regulatory measures addressing climate change; (k) economic and financial market conditions in various countries and regions; (l) political risks, including the risks of expropriation and renegotiation of the terms of contracts with governmental entities, delays or advancements in the approval of projects, and delays in the reimbursement for shared costs; and (m) changes in trading conditions. All forward-looking statements contained in this presentation are expressly qualified in their entirety by the cautionary statements contained or referred to in this section. Readers should not place undue reliance on forward-looking statements. Additional factors that may affect future results are contained in Royal Dutch Shell's 20-F for the year ended December 31, 2012 which is available at [www.shell.com/investor](http://www.shell.com/investor) and [www.sec.gov](http://www.sec.gov).

These factors also should be considered by the reader. Each forward-looking statement speaks only as of the date of this scenarios presentation, **March 2013**. Neither Royal Dutch Shell nor any of its subsidiaries undertake any obligation to publicly update or revise any forward-looking statement as a result of new information, future events or other information. In light of these risks, results could differ materially from those stated, implied or inferred from the forward-looking statements contained in this scenarios presentation.



**MOUNTAINS**



**OCEANS**

# **MOUNTAINS**

## **return of the state, the long view**

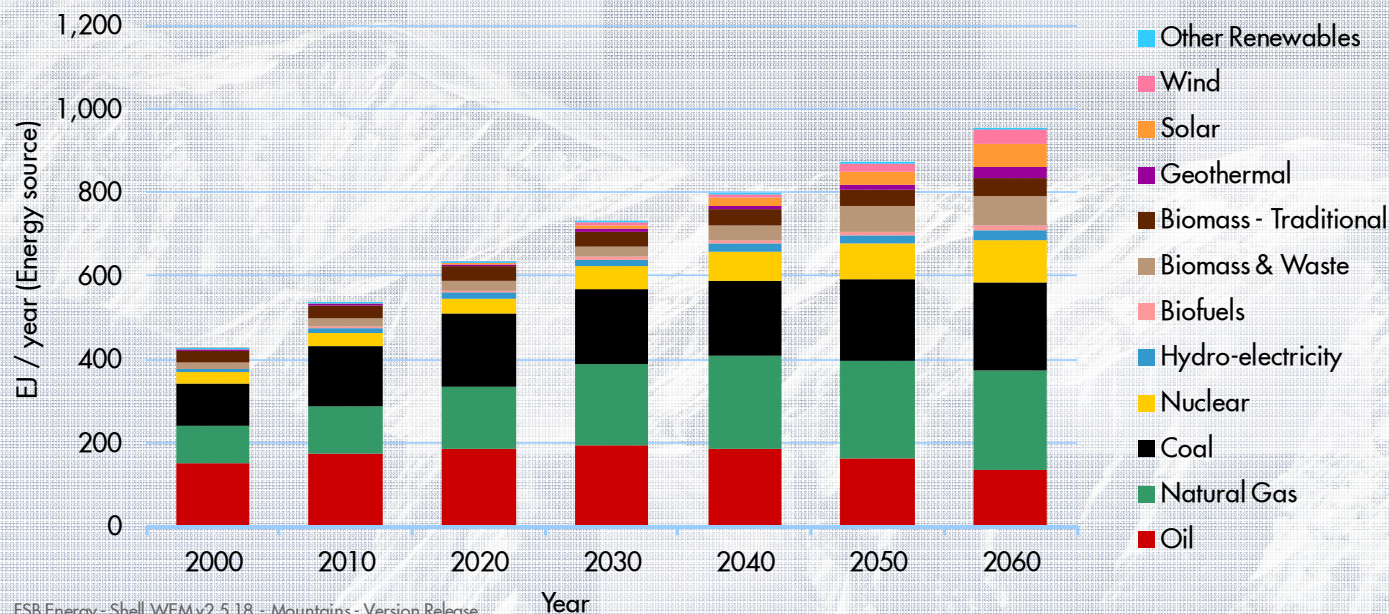
- Stability prized over growth
  - Concentration of power – elites drive policy
  - Global economic growth moderates
  - Nationalist world
- 
- Loose Energy Game with moderate energy prices



# MOUNTAINS

Rising supply, moderating demand → loose energy market

World - Total Primary Energy - By Source



- **Policy-driven initiatives** – enable investment in big projects with long term time horizons
- **The Gas Backbone** – the shale revolution goes global

- **Carbon capture and sequestration** – CCS takes off
- **Urban planning** – compact planned cities, fuel-efficient vehicles

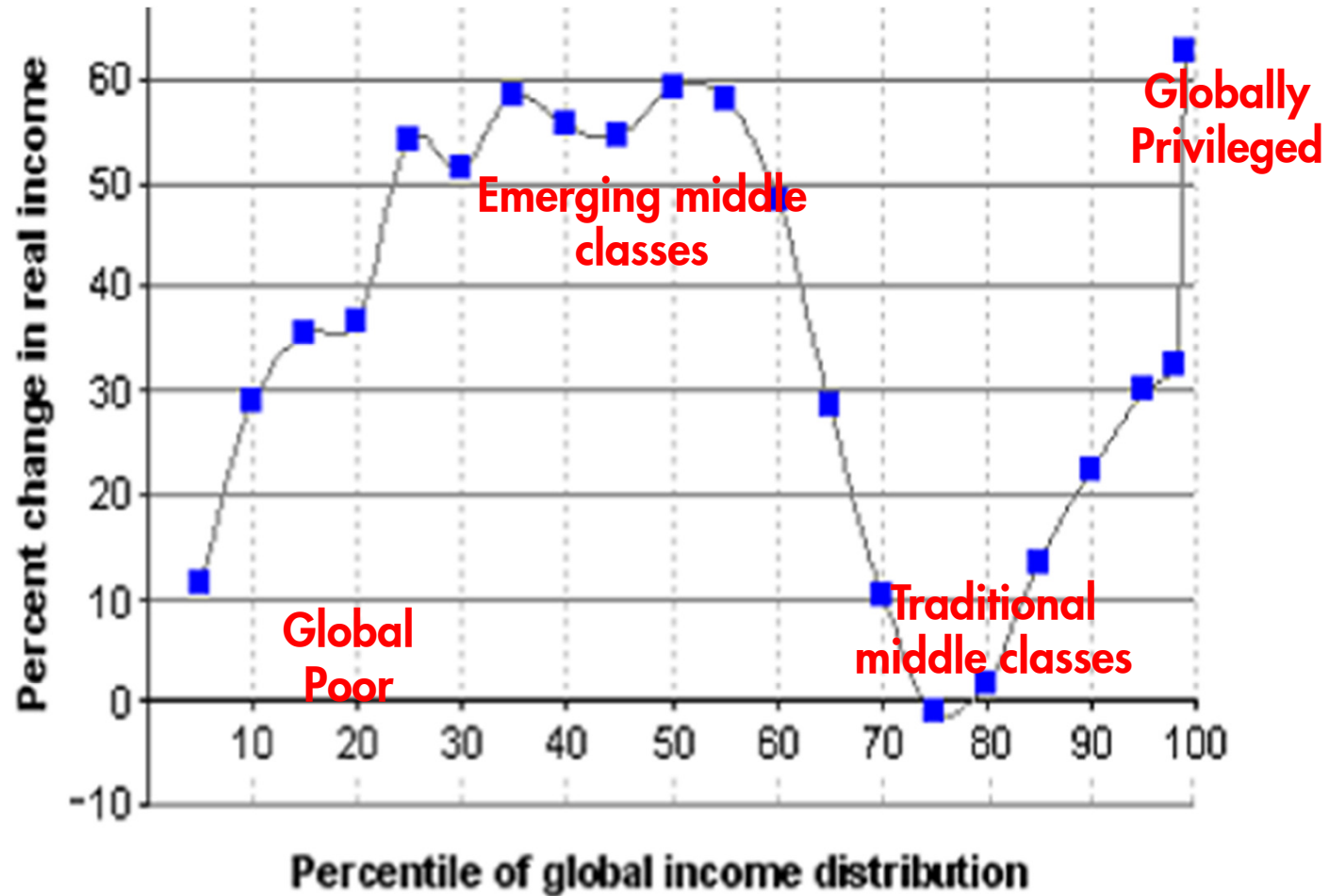


# MOUNTAINS



# OCEANS

# The prosperity tension



Percentage change in real income, 1988-2008, at various percentiles of global income distribution (in 2005 PPP dollars). (Data source: World Bank)

# OCEANS

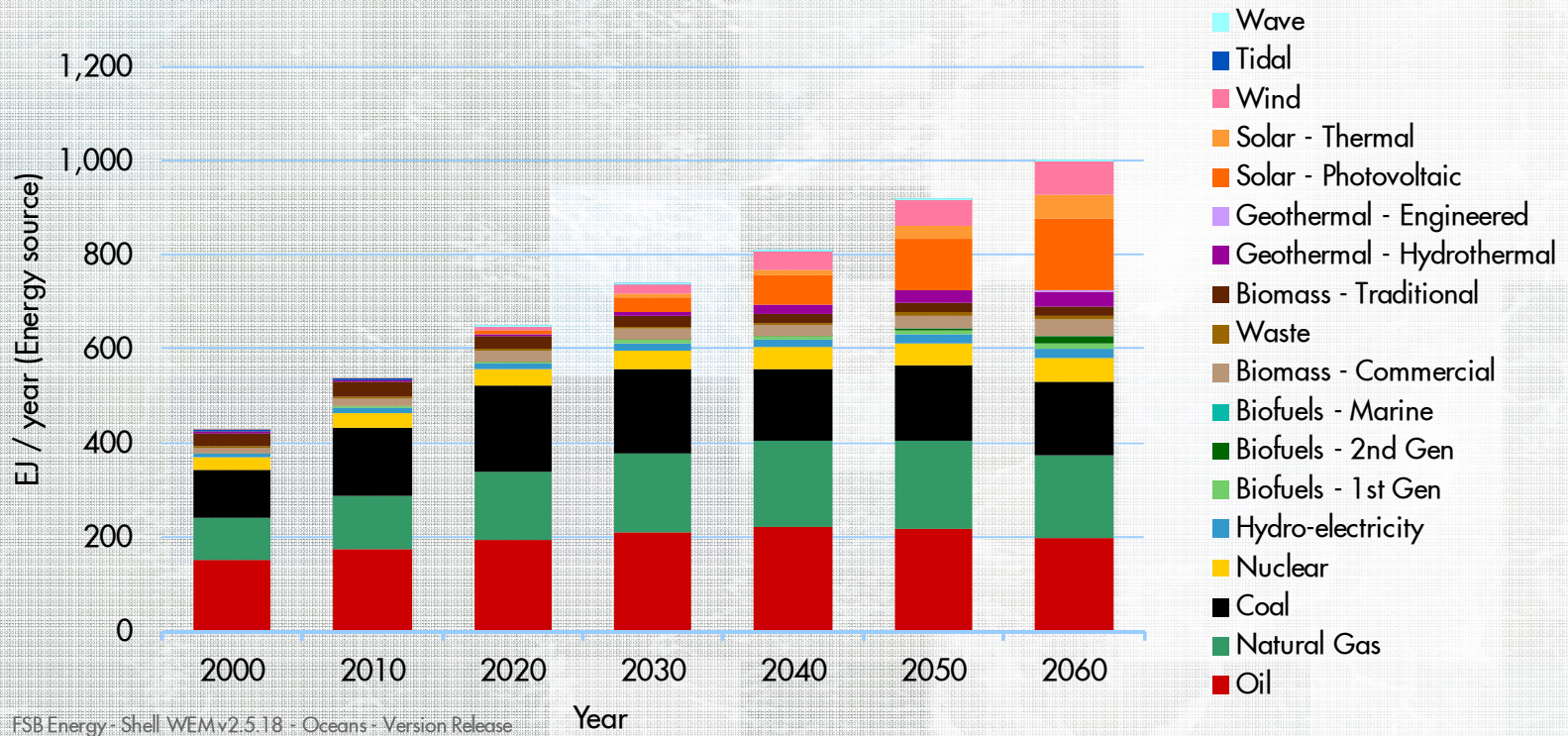
## Churn, innovation, reform

- Rising aspirations drive people power
- Reform unleashes market forces and economic growth
- Nimble, open borders world
  
- Long liquid fuel game with high energy prices

# OCEANS

rising demand, squeeze on supply → tight energy market

World - Total Primary Energy - By Source



- **Revitalised economic growth**  
→ surge in energy demand and rising energy prices
- Relentless drive for **efficiency gains**

- Renewables take off;  
**King Solar** replaces **King Coal**
- **Climate shocks** eventually drive adaptation and CCS ... but late<sup>13</sup>

# OCEANS

## Shale gas and Nimbyism



Shale-rich Spanish region vote to ban fracking



## The Daily Telegraph

**Frack the 'desolate' North East, says Tory peer (who lives in the south)**

Lord Howell, a Government energy adviser and father-in-law to George Osborne

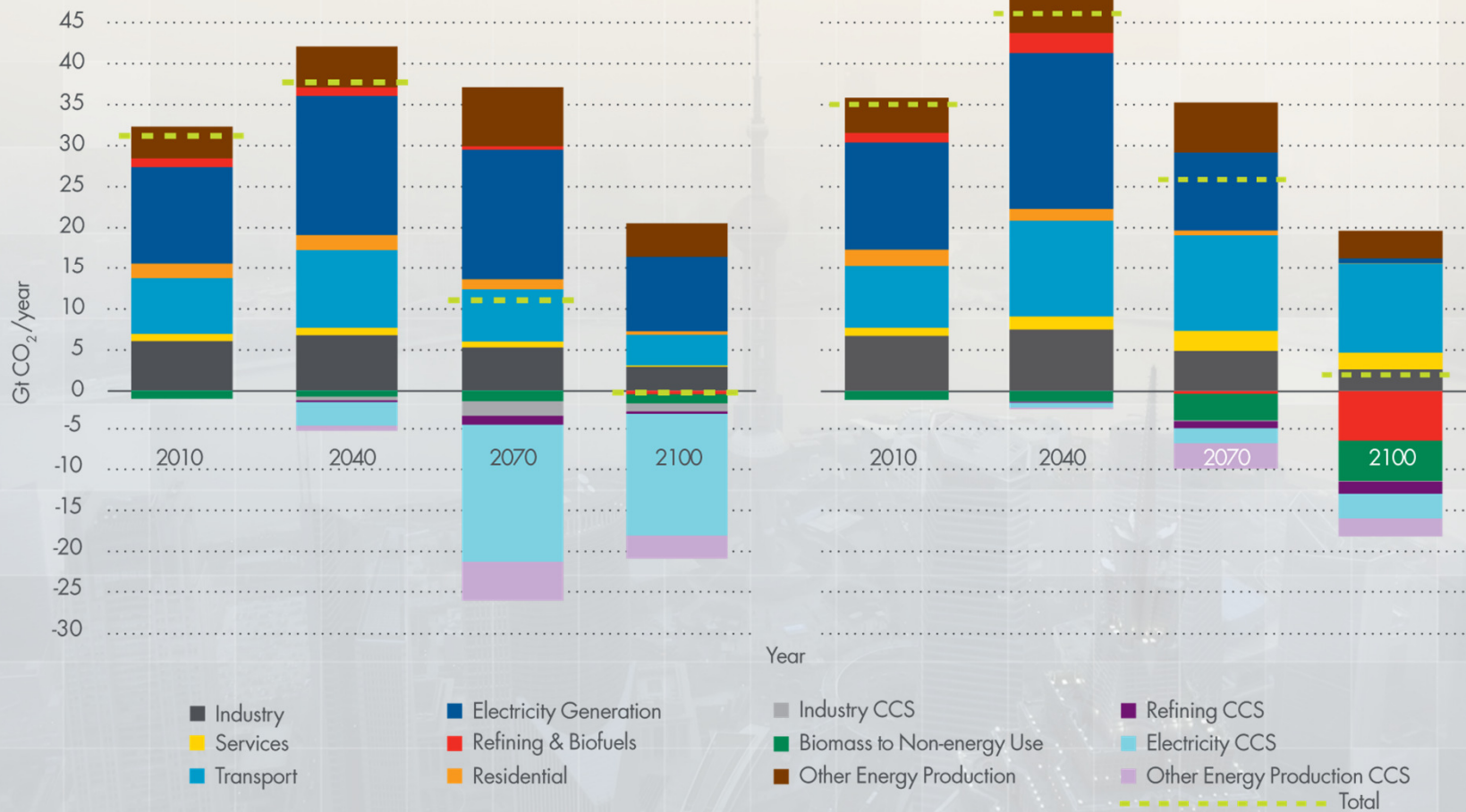


Bakken, N Dakota,  
Google Maps, July 2013

# CO<sub>2</sub> BY POINT OF EMISSION

## Mountains

## Oceans



## Comments on APERC outlook : CONCLUDING REMARKS

- Value in considering longer time horizons & taking a broad view of drivers & interactions between markets, economics, & politics
- Both scenarios have positive and troubling features  
Technology deployment important... But political, policy and societal choices as influential as resources and technology
- Clean *and* Green important: Cleaner fossil fuels (with CCS) a backbone – with a revolution in renewable energy as well
- Innovative cross-boundary collaborations are key to success



