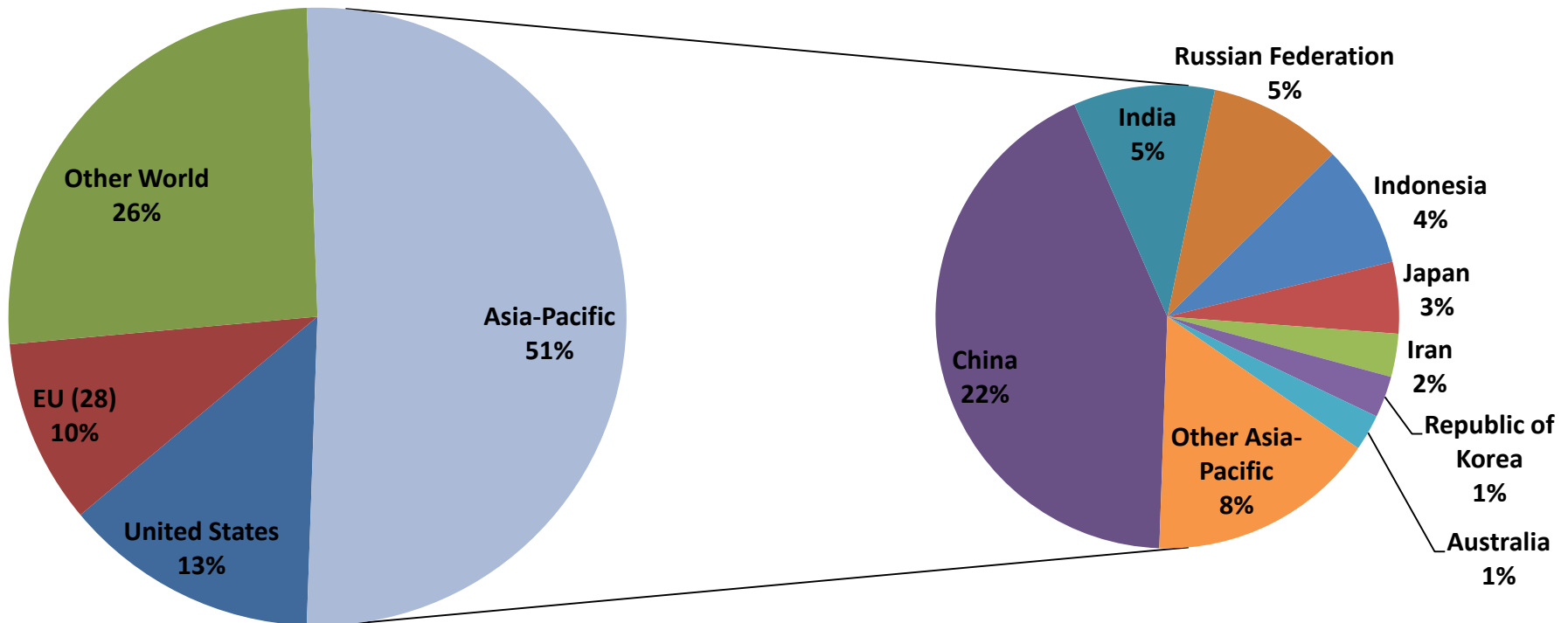


Capturing Green Investment Opportunities in Asia and the Pacific

Masato Abe, Ph.D.
Economic Affairs Officer
Trade and Investment Division
UNESCAP

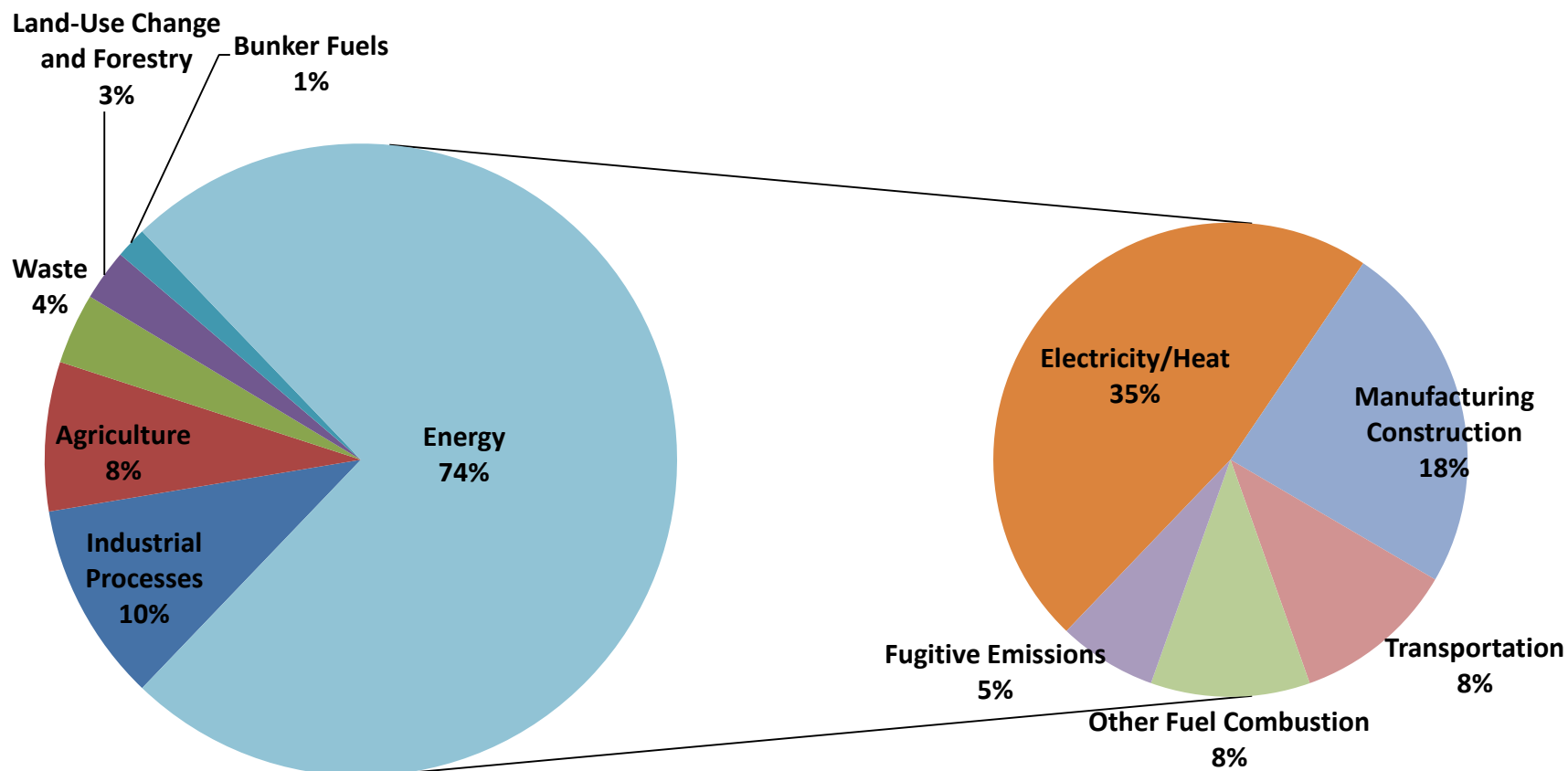
GHG emissions, by region/state



(in 2011)

Source: World Resources Institute (2015).

Asia-Pacific GHG emissions, by sector



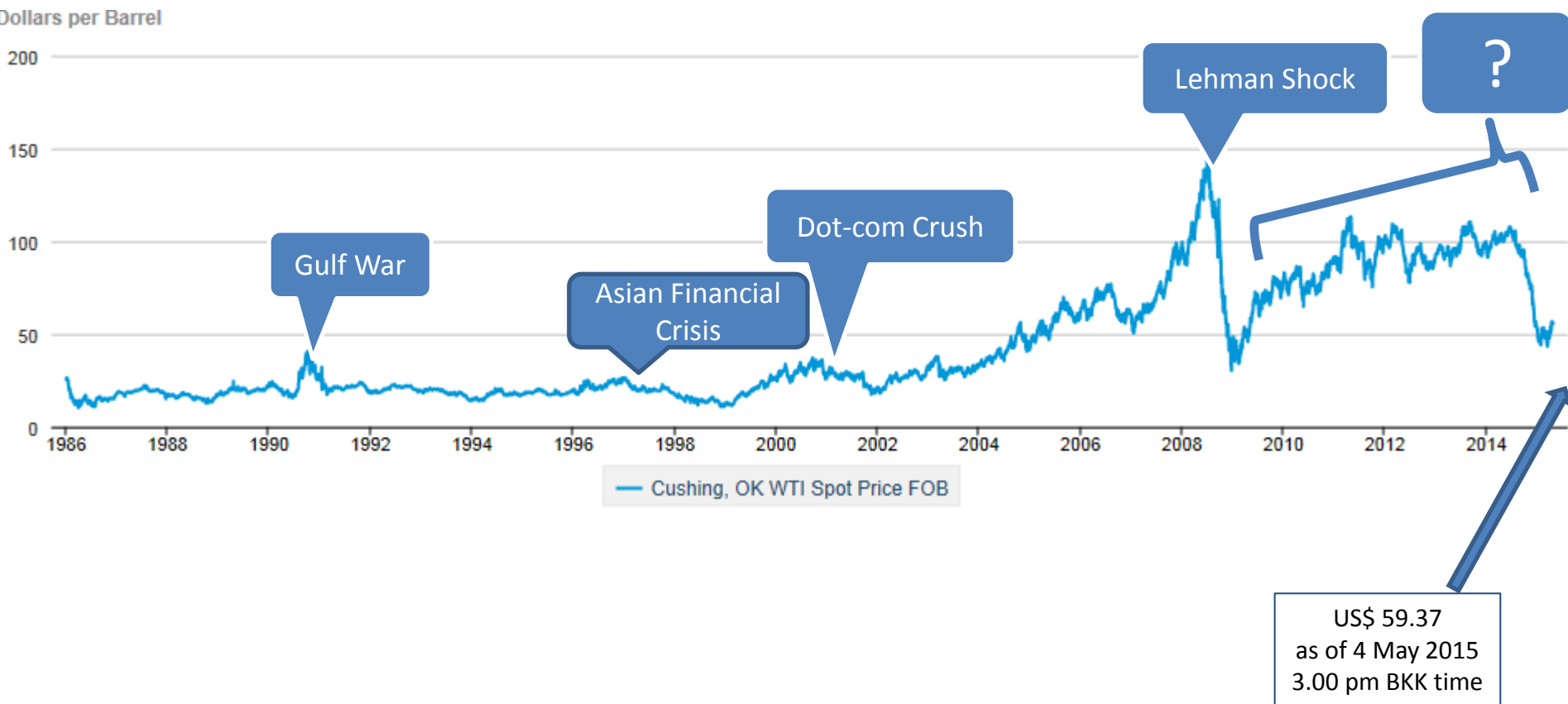
(in 2011)

Source: World Resources Institute (2015).

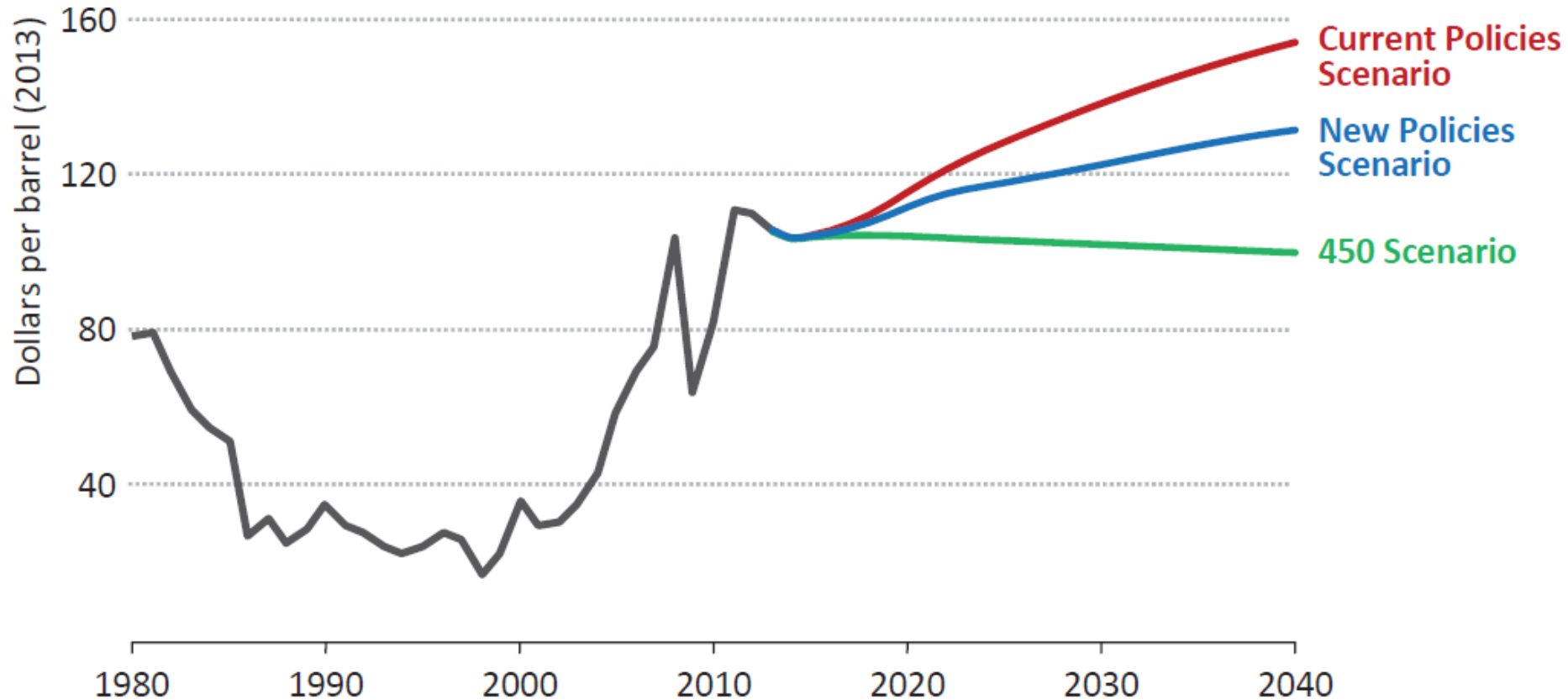
Potential of GHG reduction in 2030, by sector

Sector	Annual abatement opportunity 2010-2015 (GtCO ₂ e/year)	Life-span of infrastructure built ^a (years)	Cumulative emissions caused by each year of inaction (GtCO ₂ e)
Power	0.3	38	12.3
Industry	0.3	24	8.2
Buildings	0.1	15	2.0
Transport	0.1	15	1.3
Waste	0.1	1	0.1
Forestry	0.6	1	0.6
Agriculture	0.3	1	0.3
Total/average	1.8	14	25.0

Volatile crude oil price



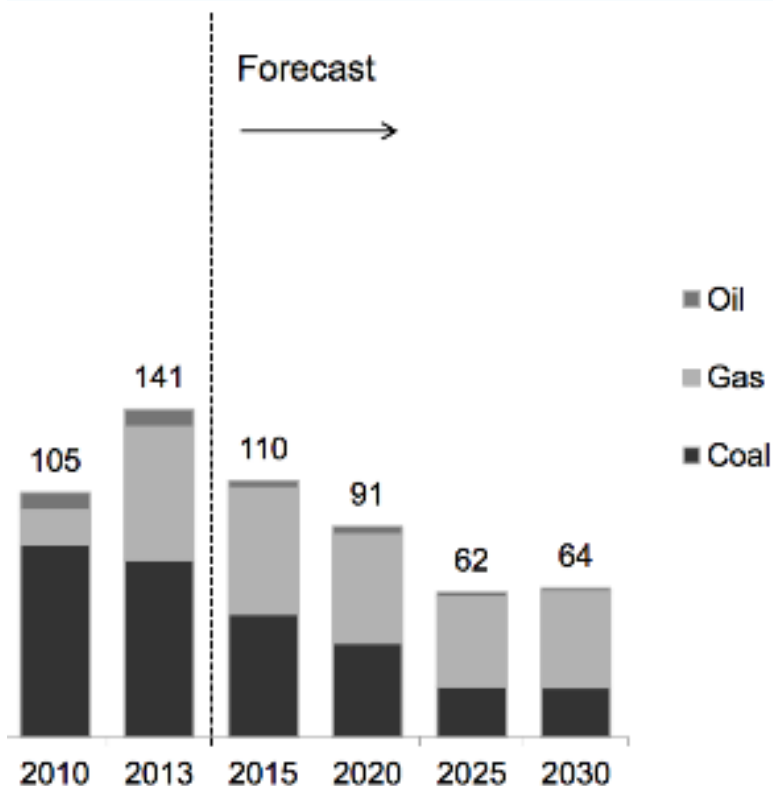
An earlier scenario of crude oil price



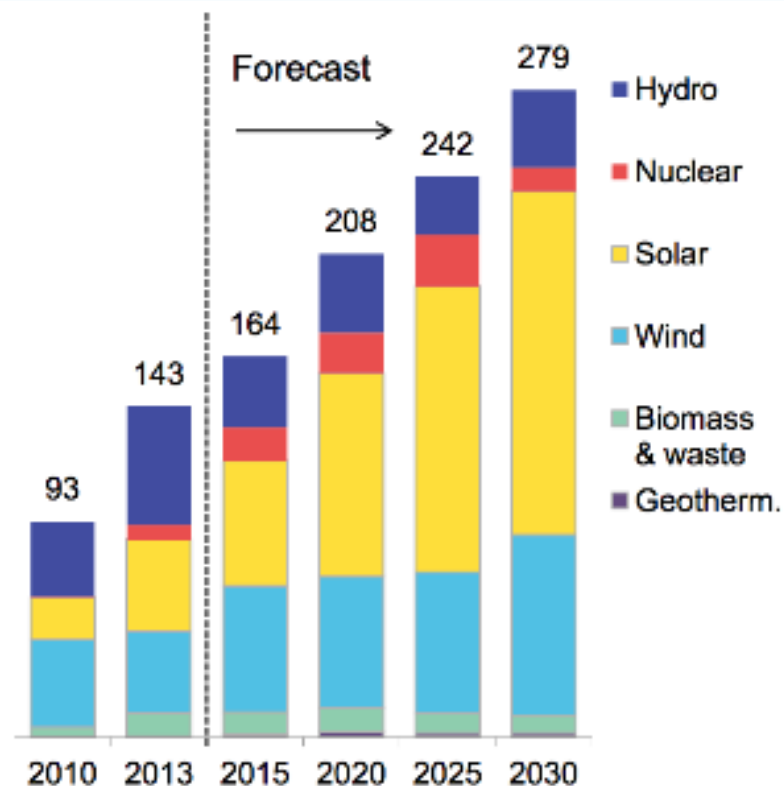
Source: IEA (2014).

Renewables have gained momentum

FOSSIL FUEL



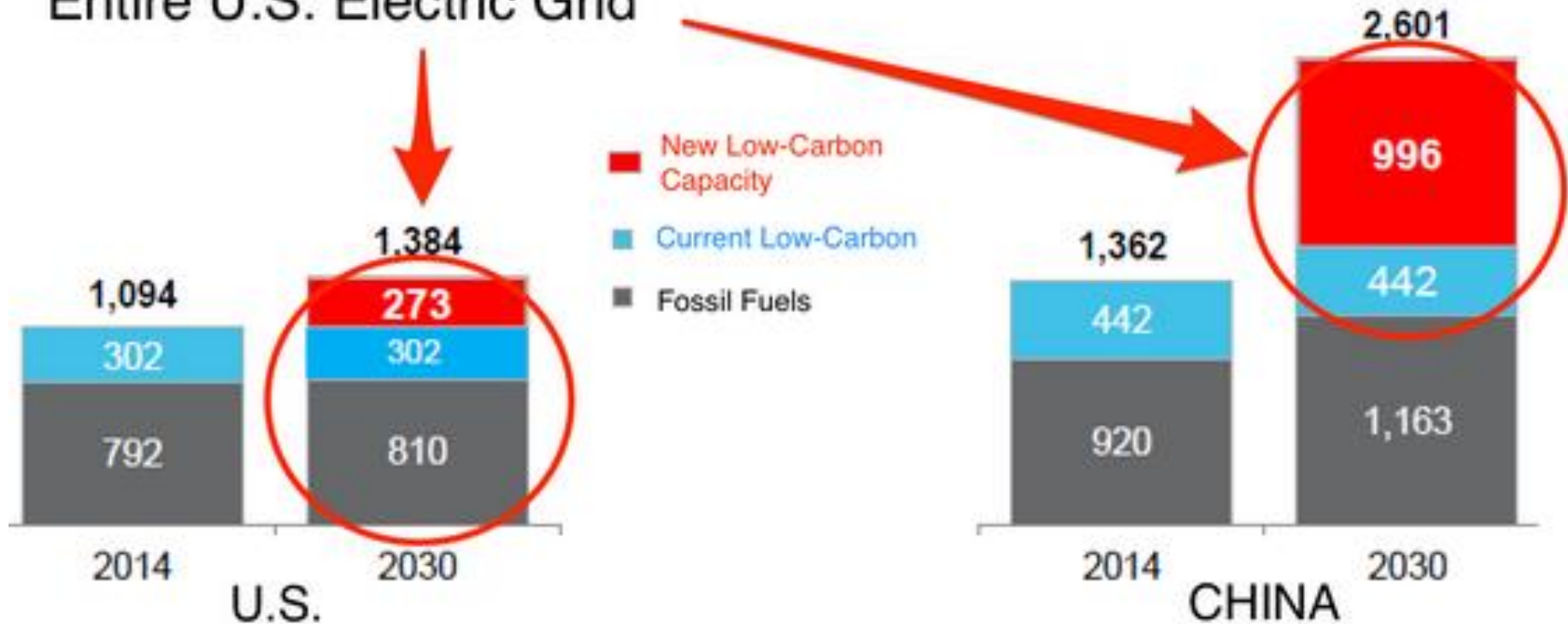
CLEAN ENERGY



Power generation capacity additions (GW)

Massive opportunity in China

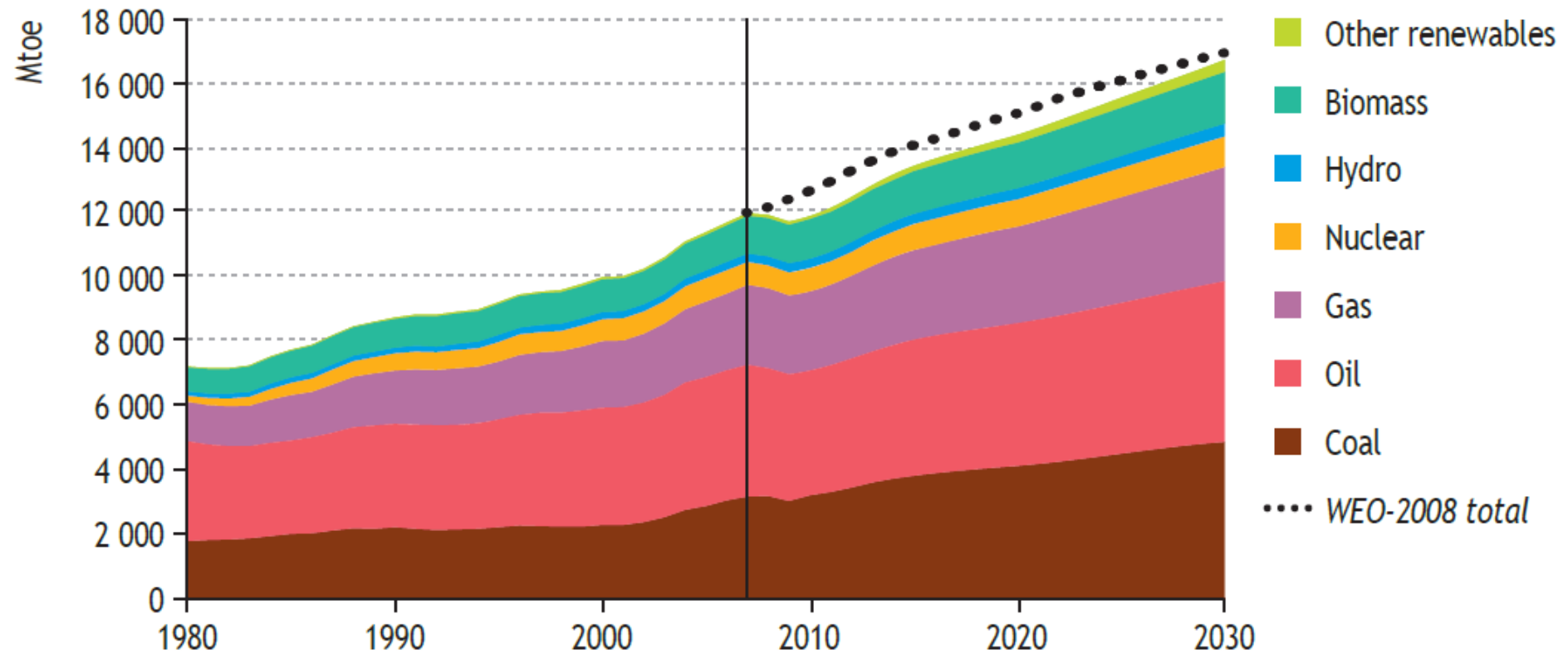
China's Low-Carbon Power Will Be Greater Than the Entire U.S. Electric Grid



Source: Bloomberg New Energy Finance (2015).

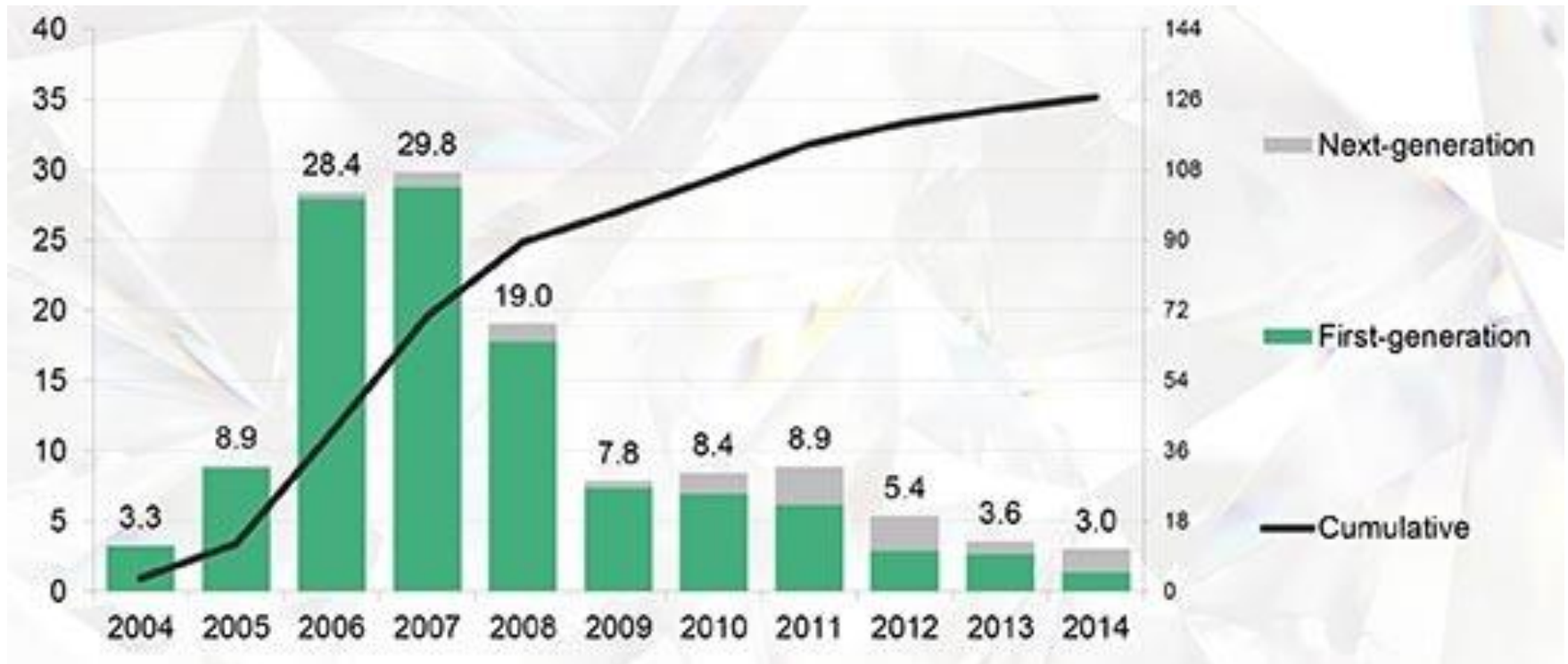
Notes: Power in gigawatts. "Low-carbon" includes hydro and nuclear.

Another scenario of energy mix



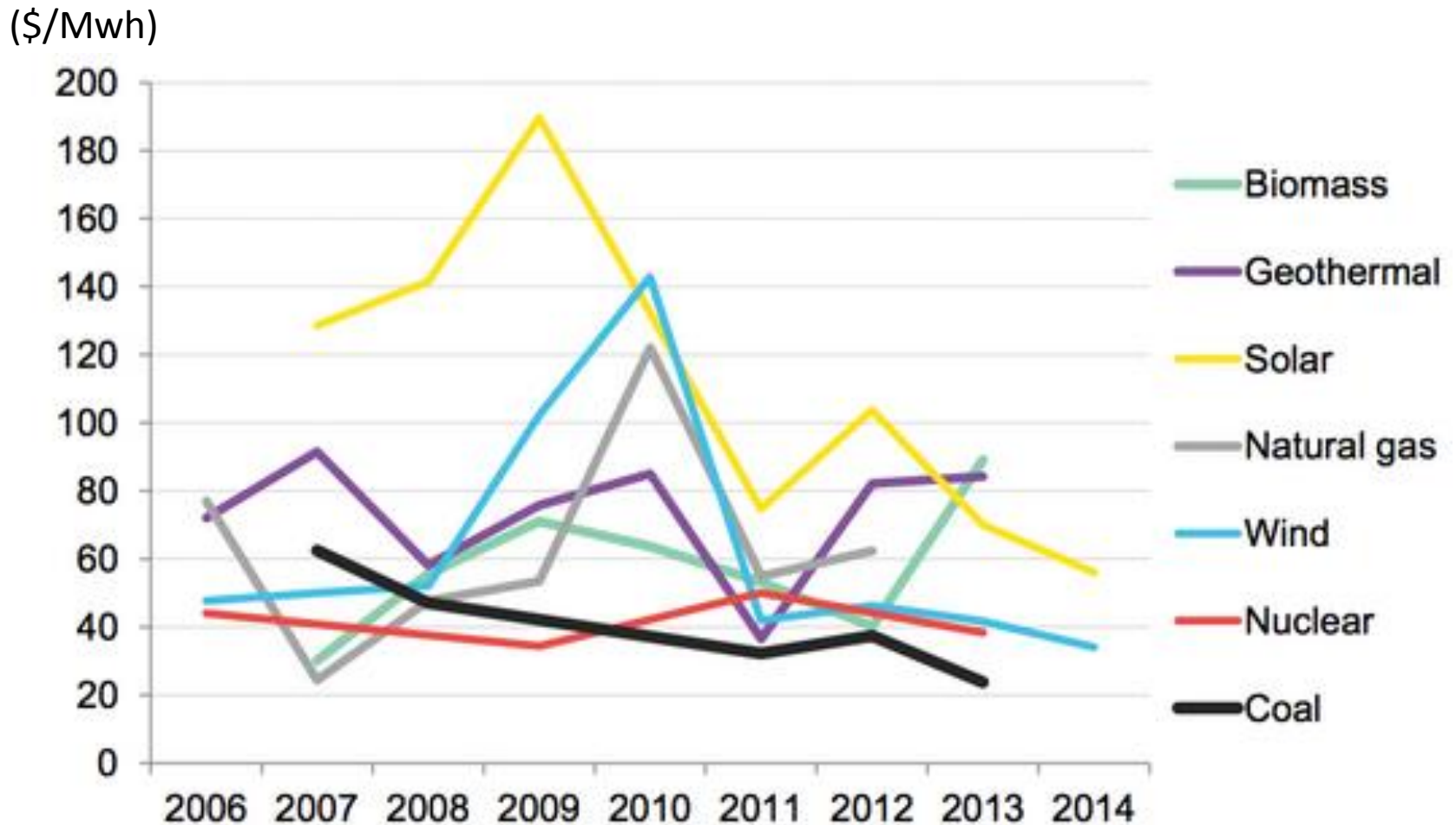
Source: IEA (2009).

But biofuel has plunged



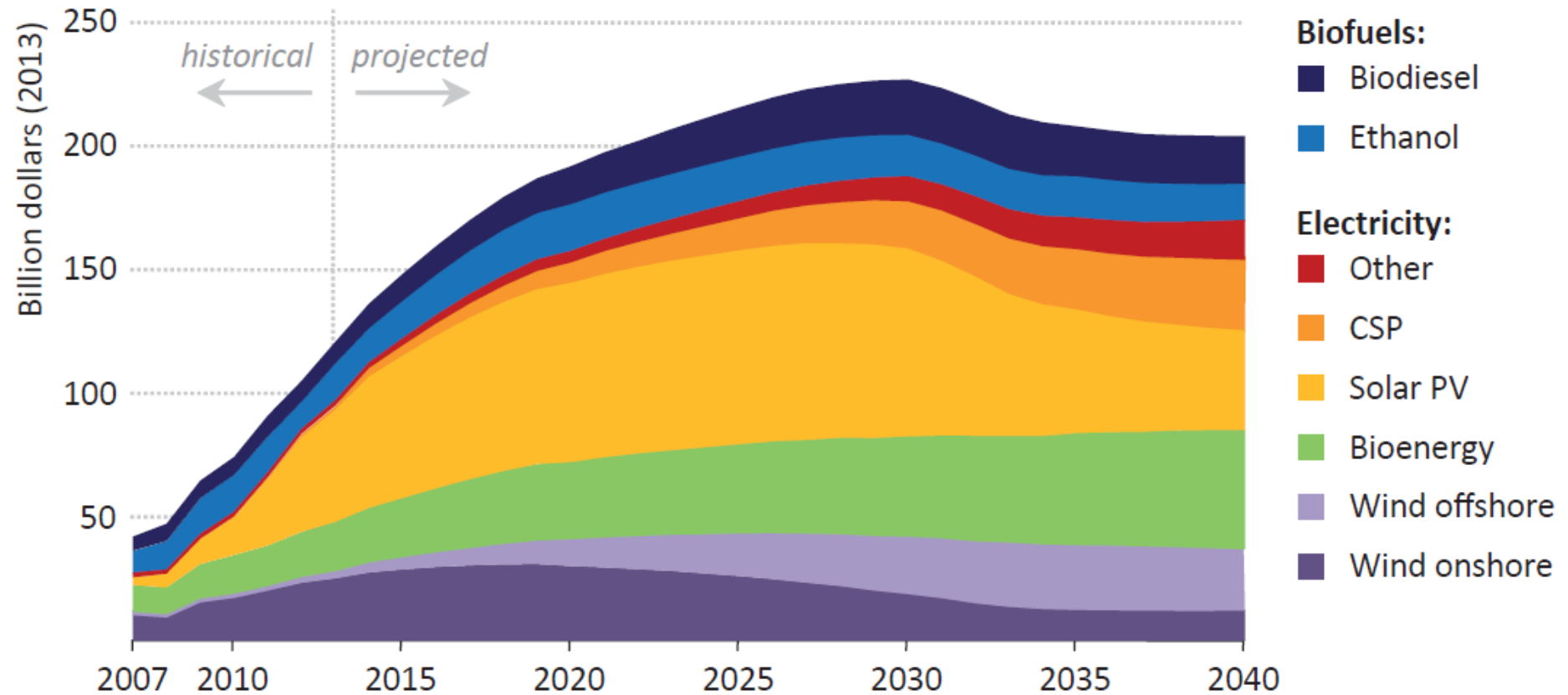
Source: Bloomberg (2015).

Solar prices are going down



Source: Bloomberg New Energy Finance (2015).

Global subsidies to renewables



Source: IEA (2014).

Electric vehicle sales, by region

2011 – 2014 (thousand units, % of total new sales)

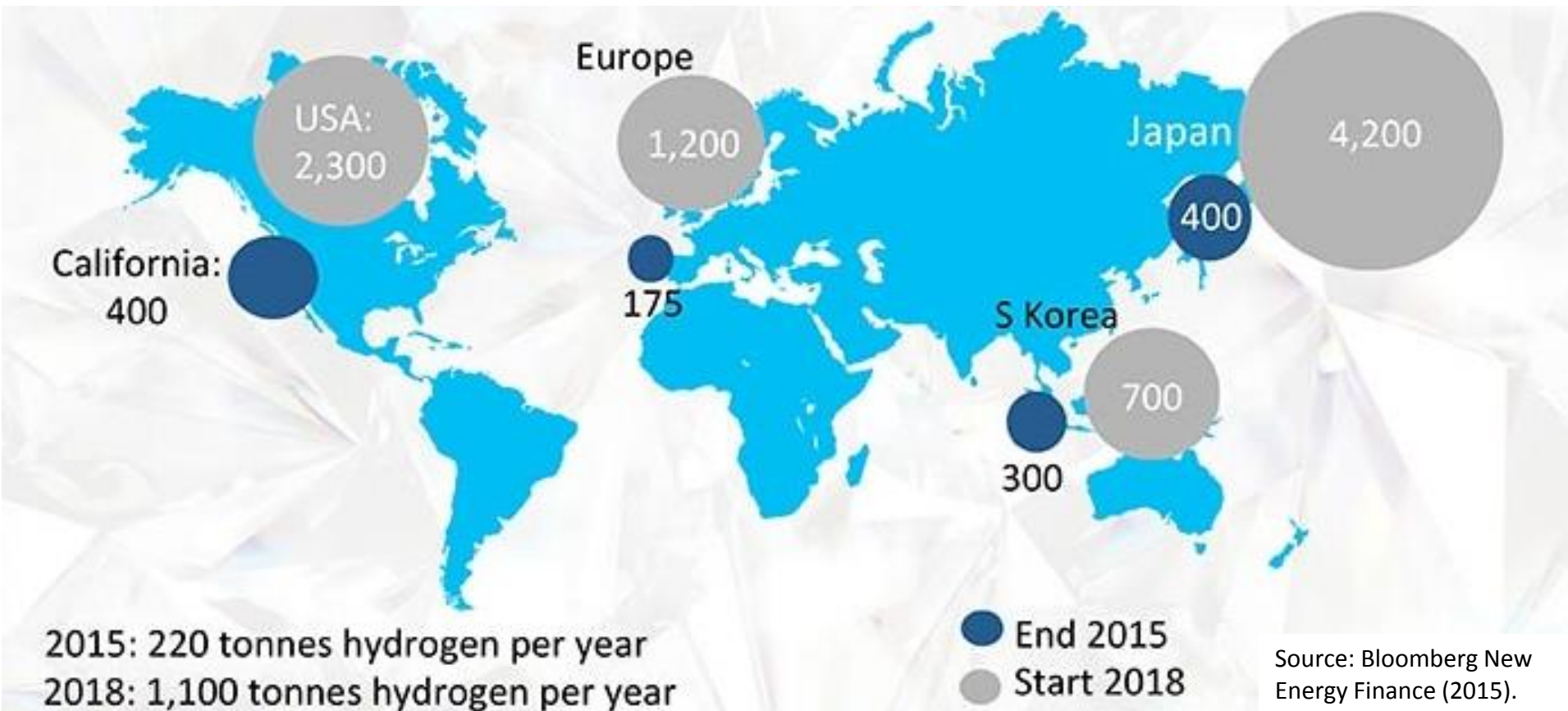


Q1 – Q4 2014 (thousand units)

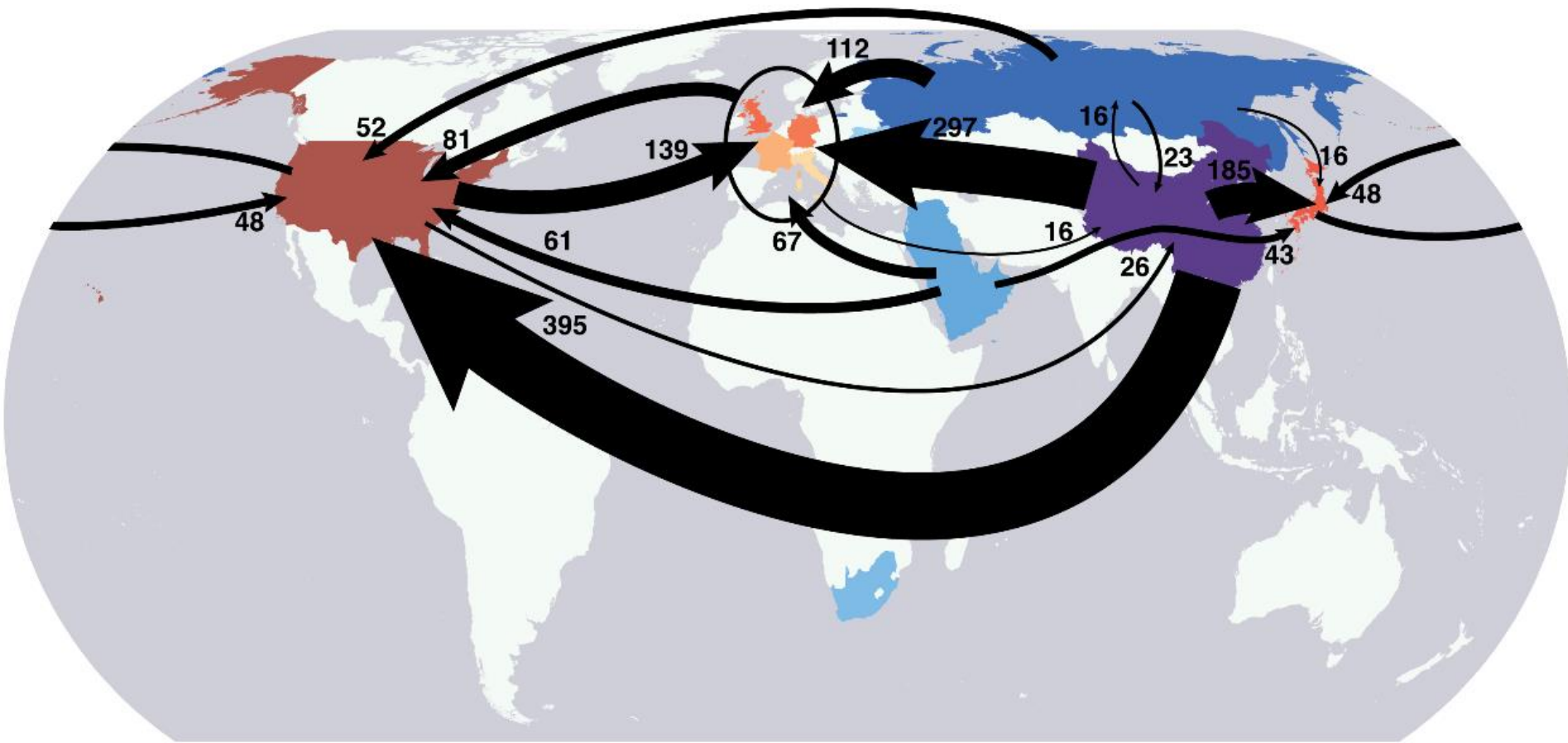


Source: Bloomberg (2015).

Fuel-cell vehicles are finally moving out



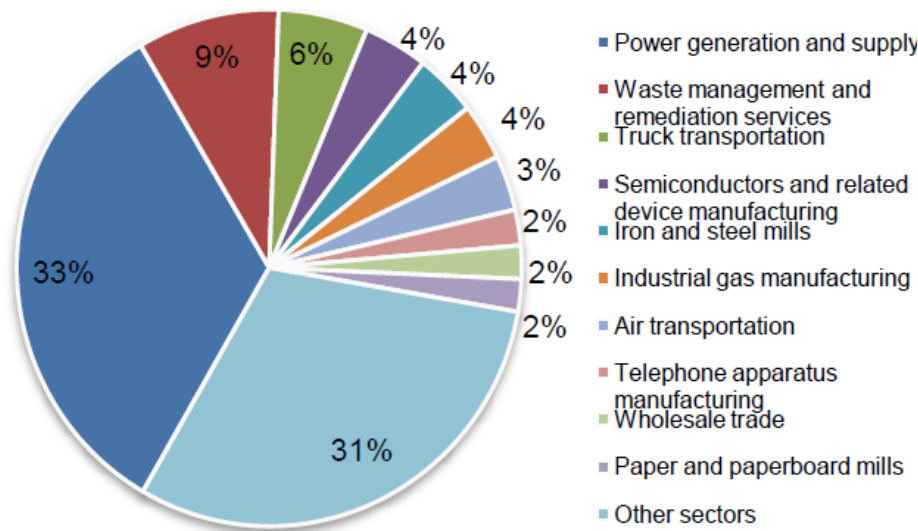
Emissions via global value chains



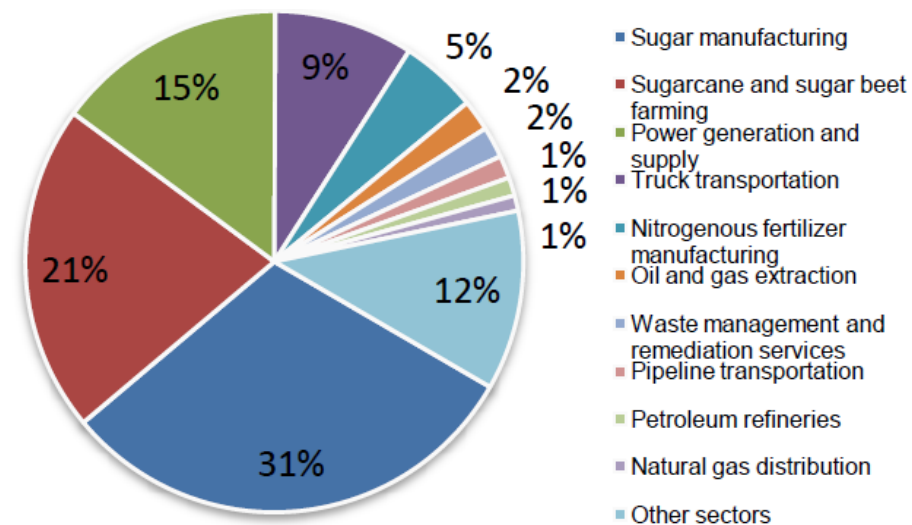
(Megatons of CO2 in 2004)

Difficulty in providing a simple solution

Mobile phone



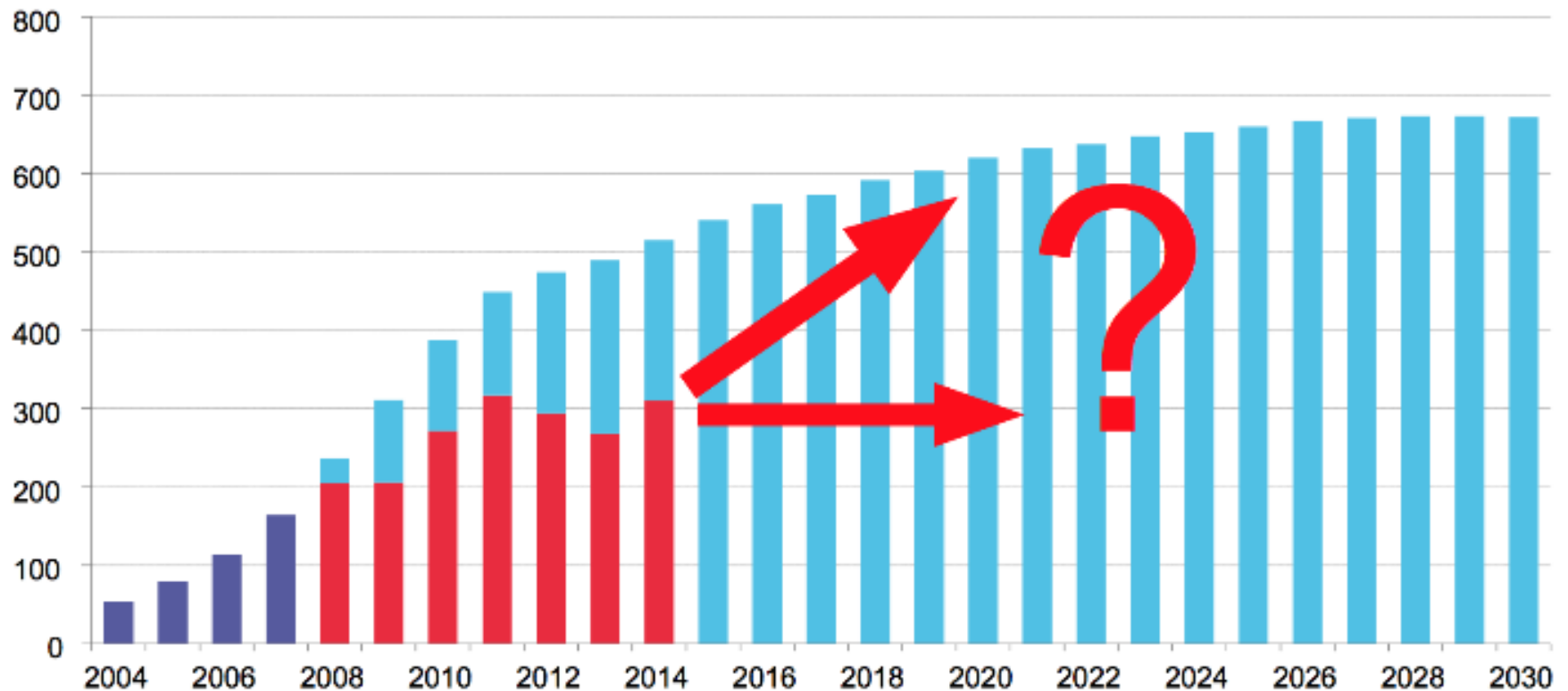
Sugar



Source: WEF (2009).

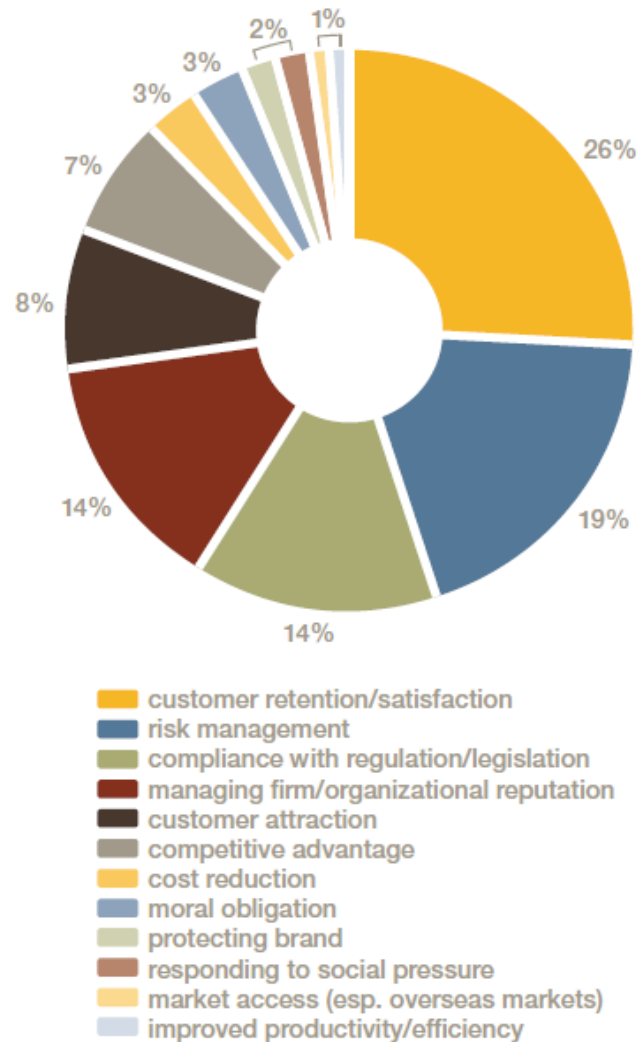
Green investment: Market failure?

USD in billion



Source: Bloomberg New Energy Finance (2015).

Reactive motivations for green investment



Trends and challenges

- Diversified status
 - Gaps among region and countries
 - Large GHG emissions by some states
 - Business opportunities
- Increasing industrial activities
- Dominance of energy generation
 - Electricity/heat; manufacturing; transportation
- Emergence of new energy mix
- Technology development
 - Product efficiency
 - Manufacturing efficiencies
 - Transmission, distribution and storage efficiency
- Production capacity/consolidation
- International competition
- Unpredictable/uncontrollable business environment
 - Risk in green investment

Implications for Asia-Pacific business

- Market effectiveness and failure
 - Who will/should win?
 - Change the rule of game?
- Energy efficient products
 - Products/services
 - Process
 - Energy efficient value chains
- Asia-Pacific as a major destination for green investment by both locals and foreigners
 - Advanced technology
 - Cost advantage
- New strategies for global value chains
- Further public interventions needed
 - Reduced risk on the market failure
 - Rules and regulations
 - Policies and subsidies
 - Regional cooperation

The end of presentation

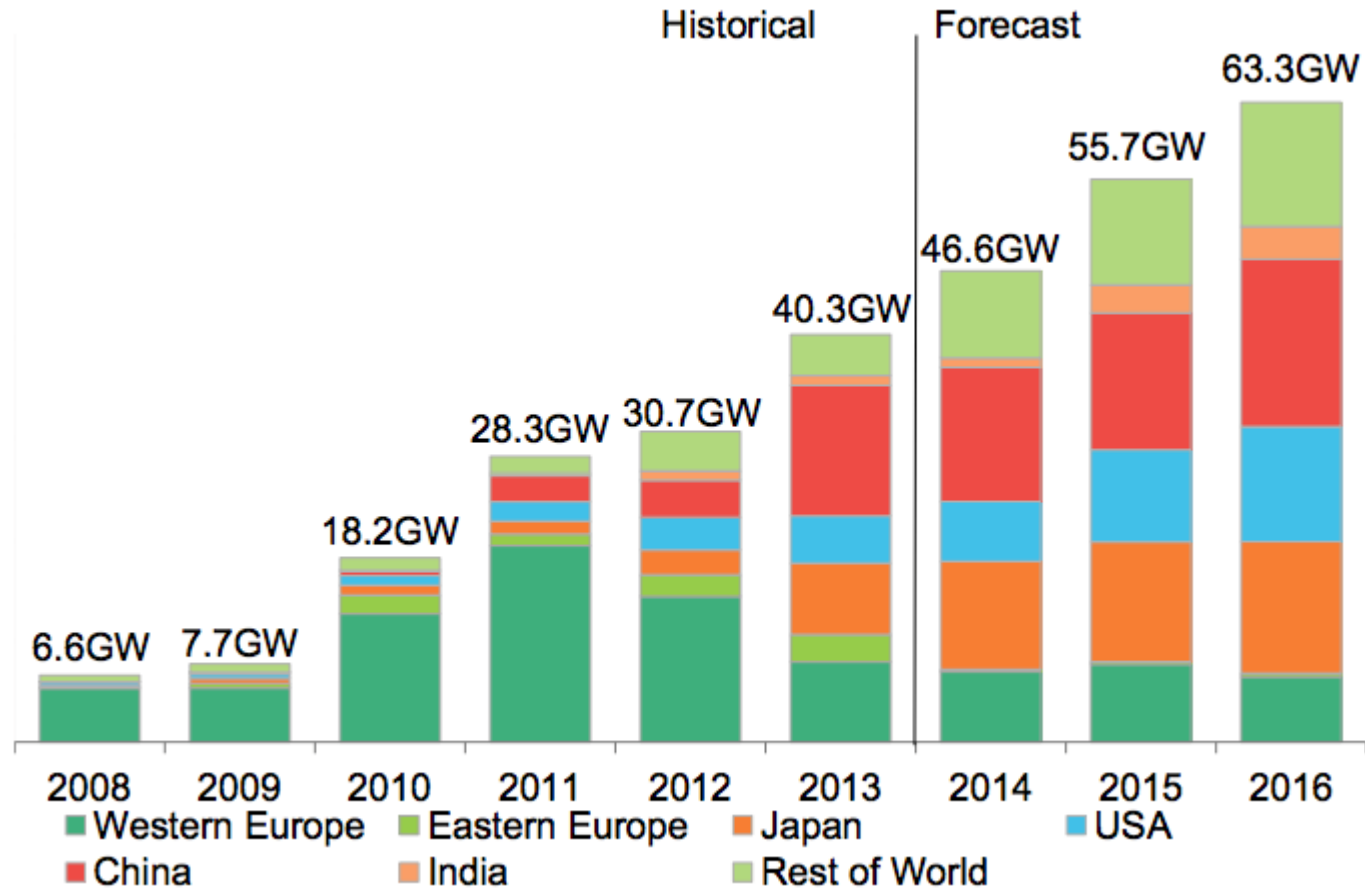
Solar energy

- Solar is the newest major source of energy in the mix
- It makes up less than 1 percent of the electricity market today
- It became a rising star, seen to be the world's biggest single source by 2050 (IEA, 2014)

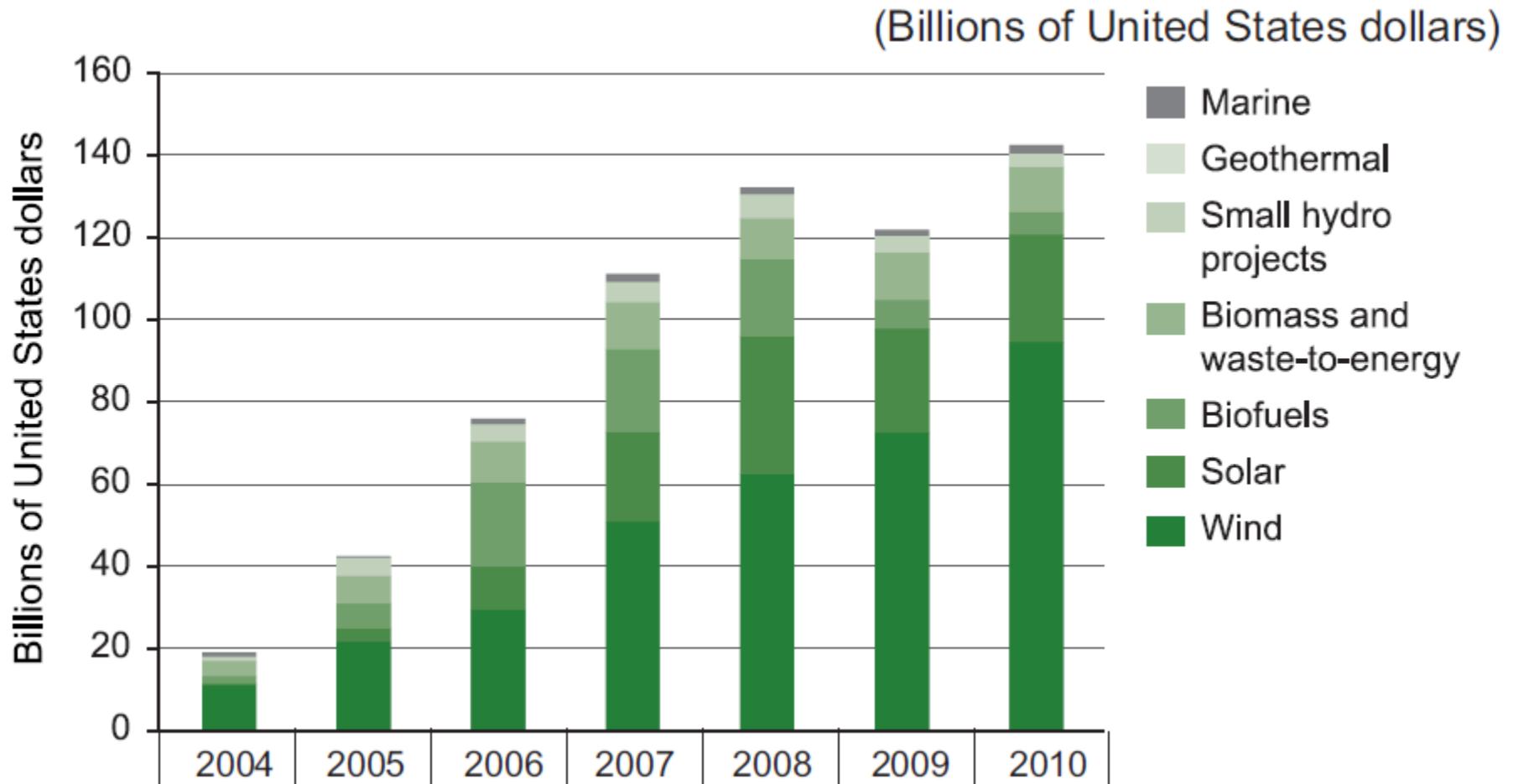
Rapid cost down in solar energy

- Hardware costs
 - Polysilicon, solar panels or solar modules
 - Increasing efficiency of solar cells
 - Manufacturing technology improvements
 - Economies of scale
 - Intense competition
 - Overproduction and fire sales
 - e.g. Chinese producers in 2009-10
 - Land
- Software costs
 - Permission
 - Installation
 - Supply chains
 - Channels and distribution
 - Operations
- Heavy and sustained subsidies and tax break

Green investment (renewable energy)



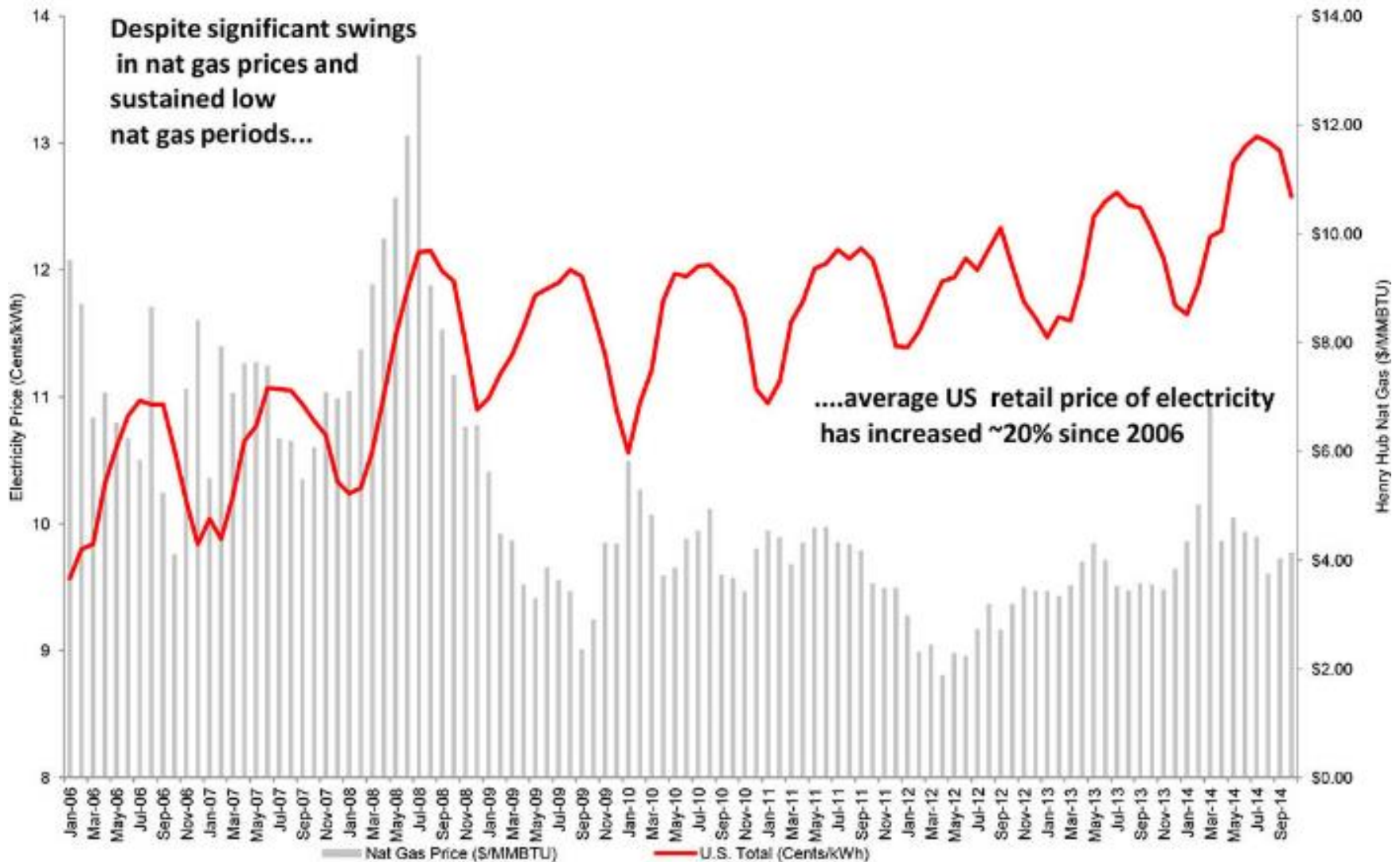
Green investment, by sector



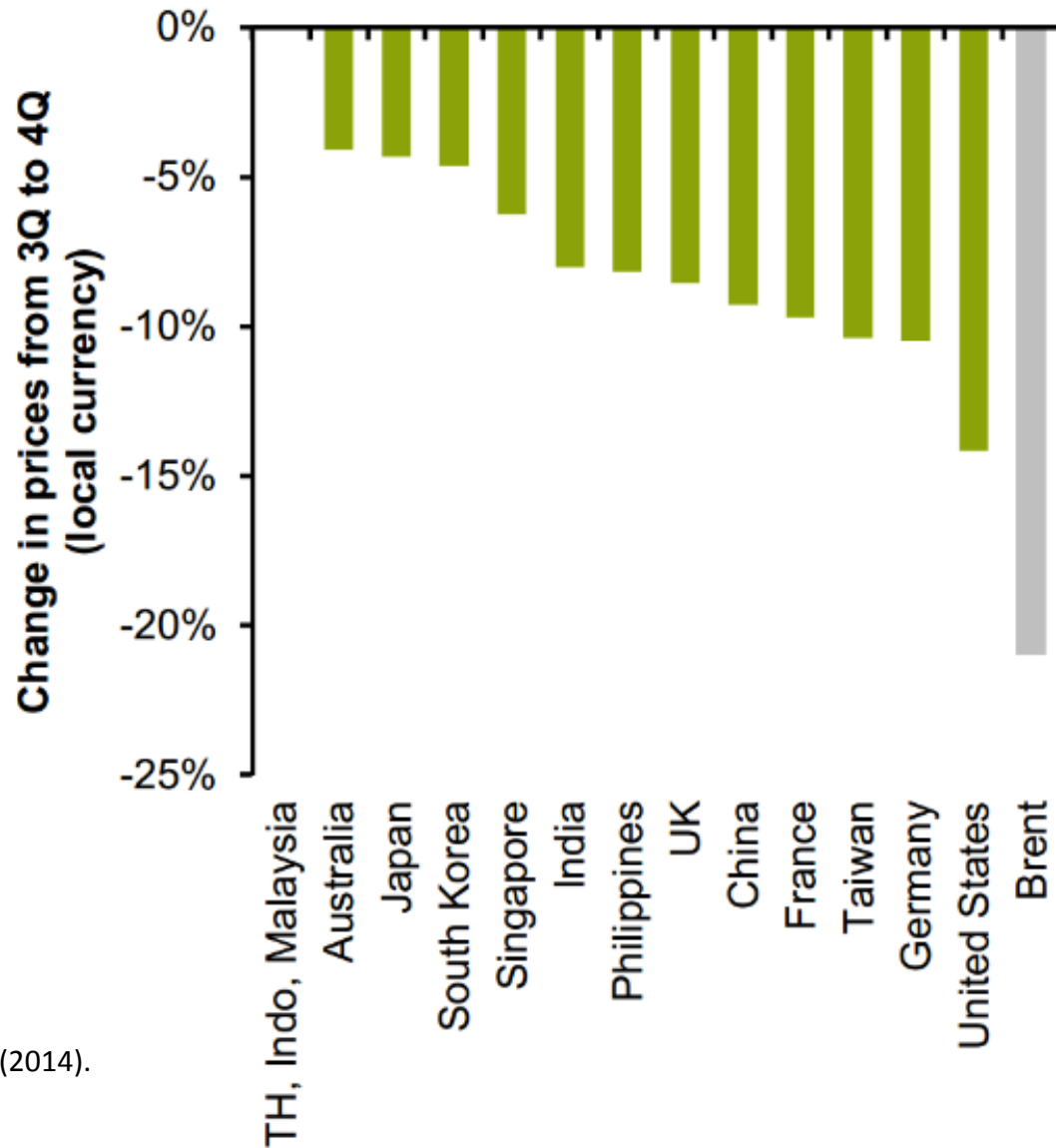
Source: UNEP/SEFI/Bloomberg New Energy Finance (2010).

Notes: Large hydro-power projects are not included.

Electricity prices are going up

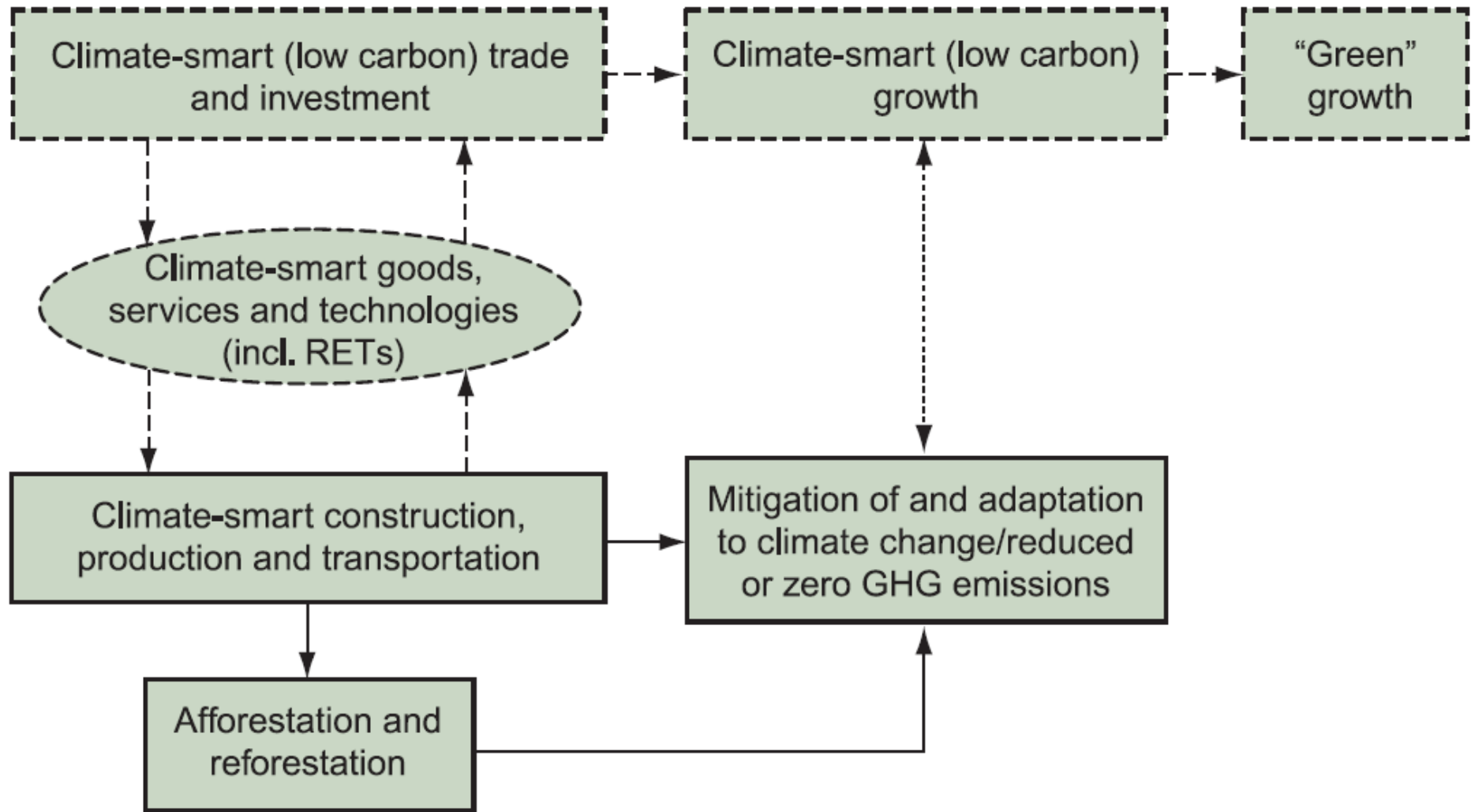


Pump prices haven't dropped much



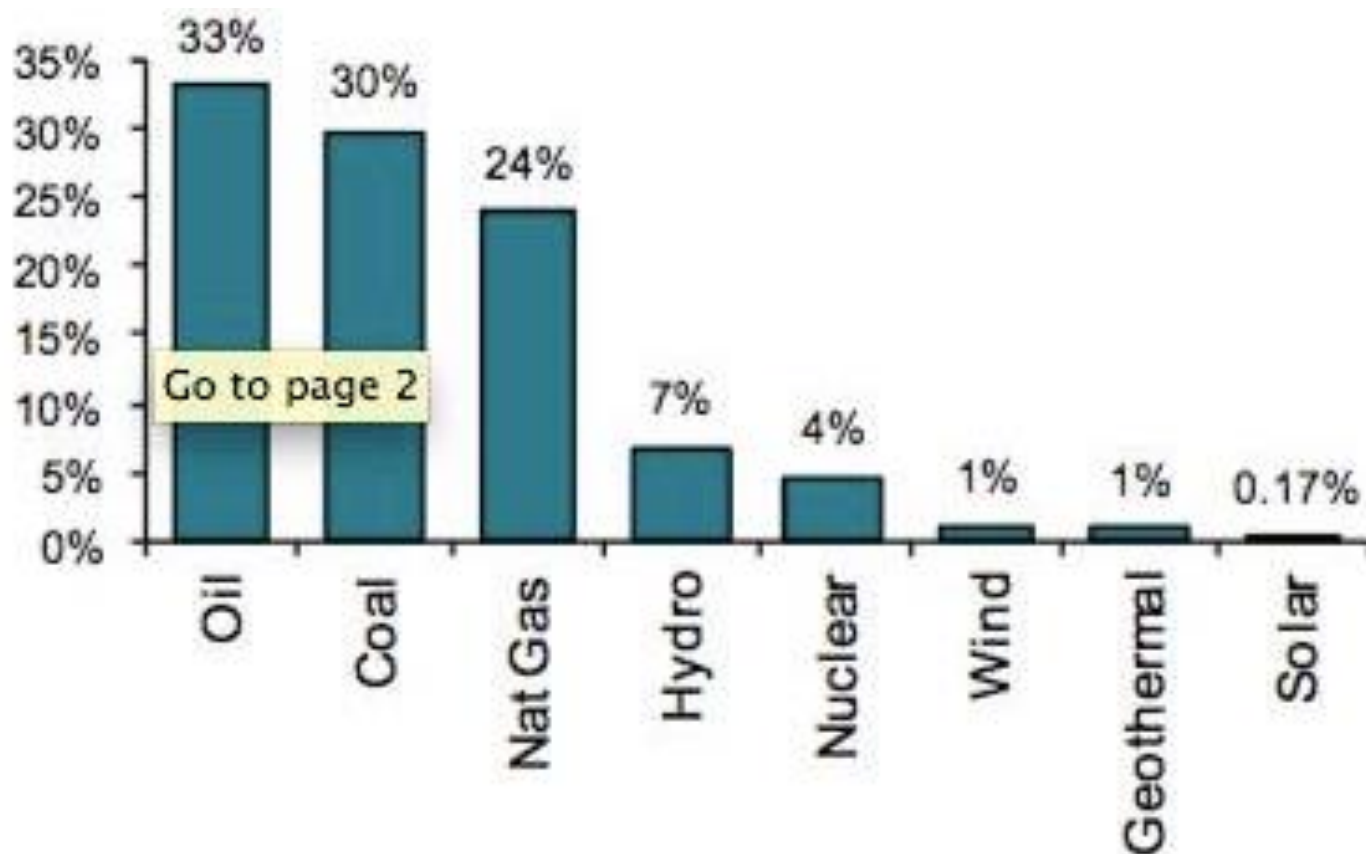
Source: Bernstein Research (2014).

Green investment linkages



Global energy supply, by type

(2012)



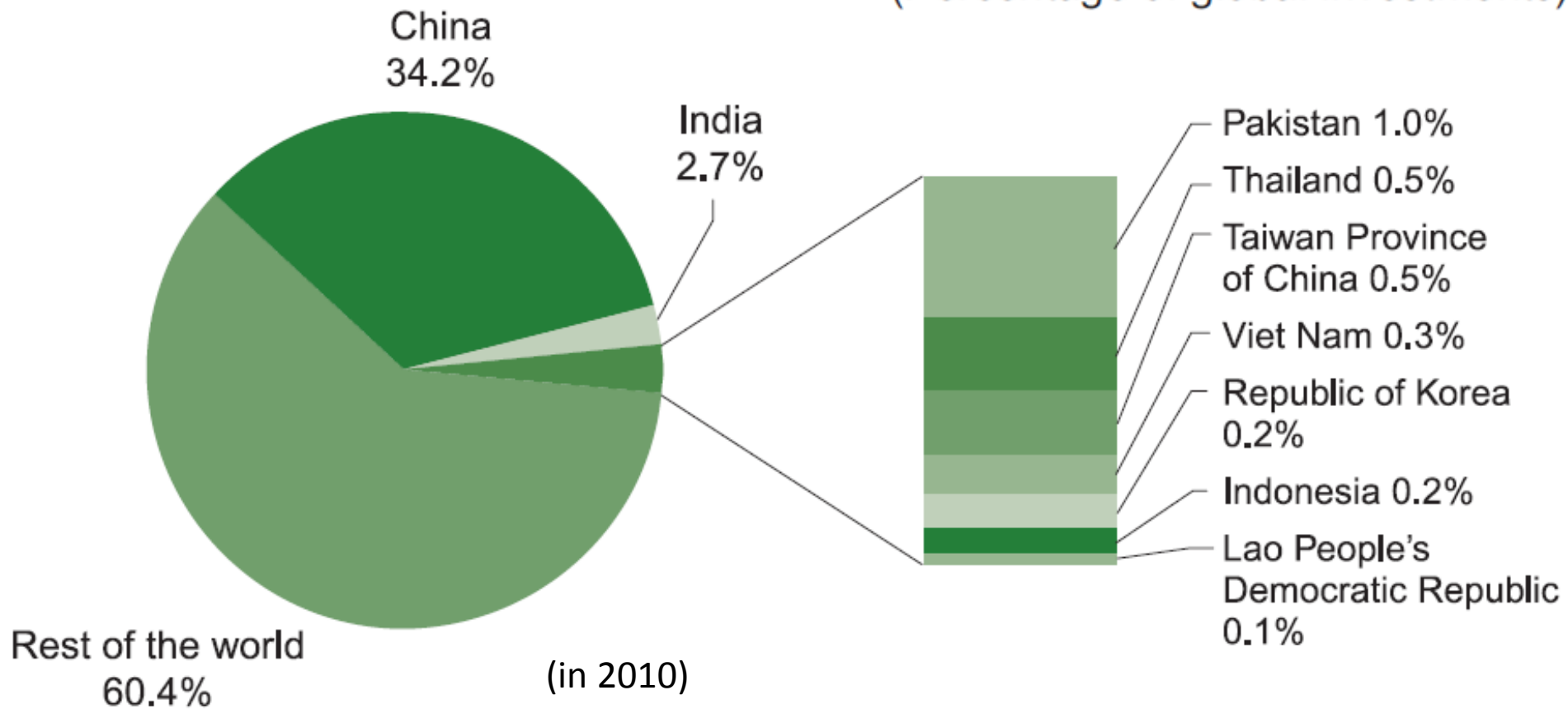
Sources: BP Energy Source; Bernstein Analysis (2013)

G-20 top 10 performers in green investment, 2010

Investment (billions of United States dollars)		Investment intensity (percentage of GDP)		Five-year growth in RE investment 2005-2010 (percentage)		Installed RE capacity (GW)		Five-year growth in RE capacity (percentage)	
China	54.4	Germany	1.40	Turkey	190	China	103.36	China	106
Germany	41.2	Italy	0.79	Argentina	115	United States	57.99	Republic of Korea	88
United States	34.0	China	0.55	South Africa	94	Germany	48.86	Turkey	85
Italy	13.9	Canada	0.42	Indonesia	89	RoEU-27	39.80	Germany	67
RoEU-27	13.4	Australia	0.37	China	88	Spain	27.78	RoEU-27	45
Brazil	7.6	Spain	0.36	Brazil	81	Japan	25.96	Italy	45
Canada	5.6	Brazil	0.35	Mexico	74	India	18.65	Japan	45
Spain	4.9	RoEU-27	0.30	Italy	71	Italy	16.66	Brazil	42
France	4.0	United States	0.23	Republic of Korea	62	Brazil	13.84	France	42
India	4.0	France	0.15	RoEU-27	62	France	9.57	Spain	39

Green investment in developing Asia-Pacific

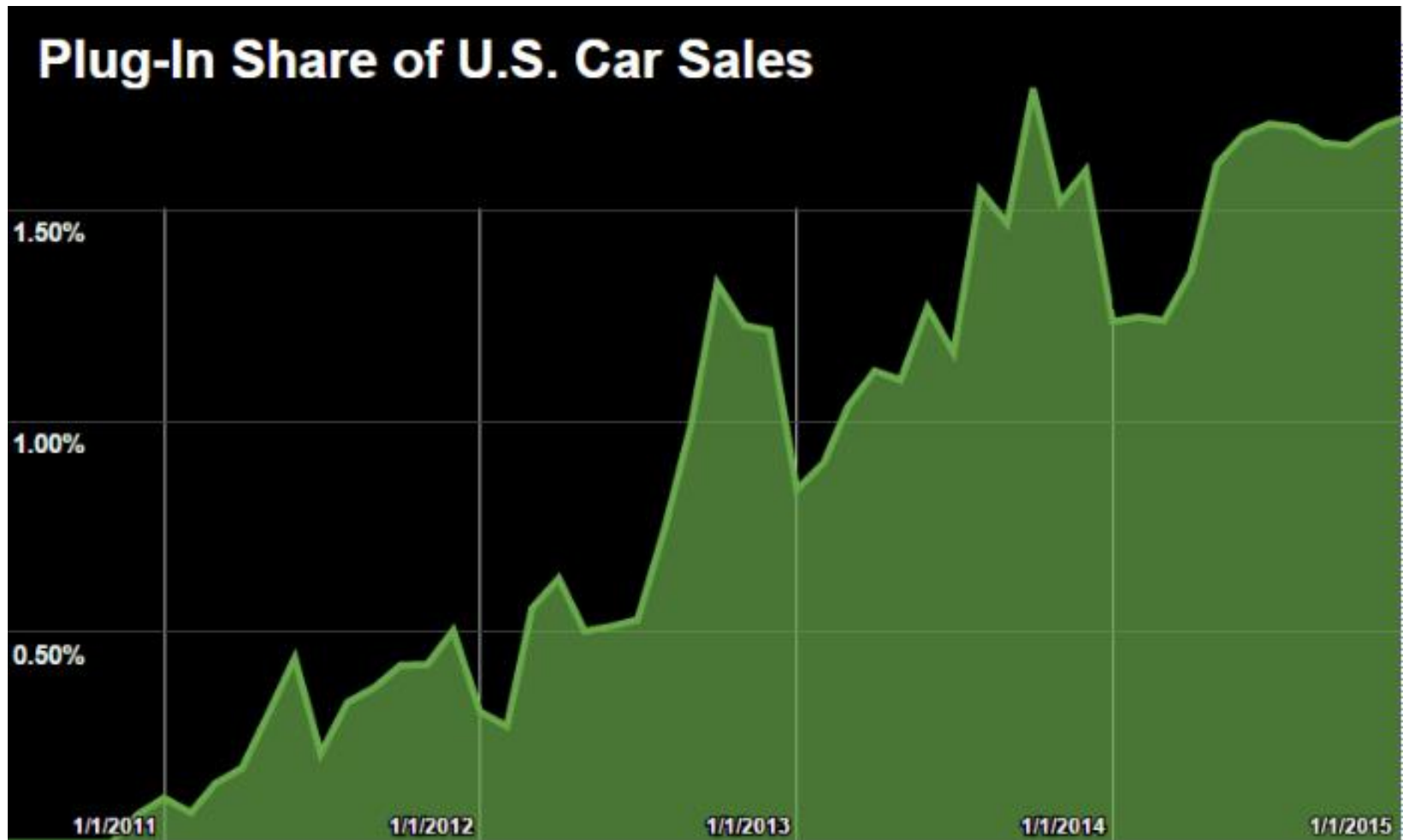
(Percentage of global investments)



Source: UNEP/Bloomberg New Energy Finance (2011).

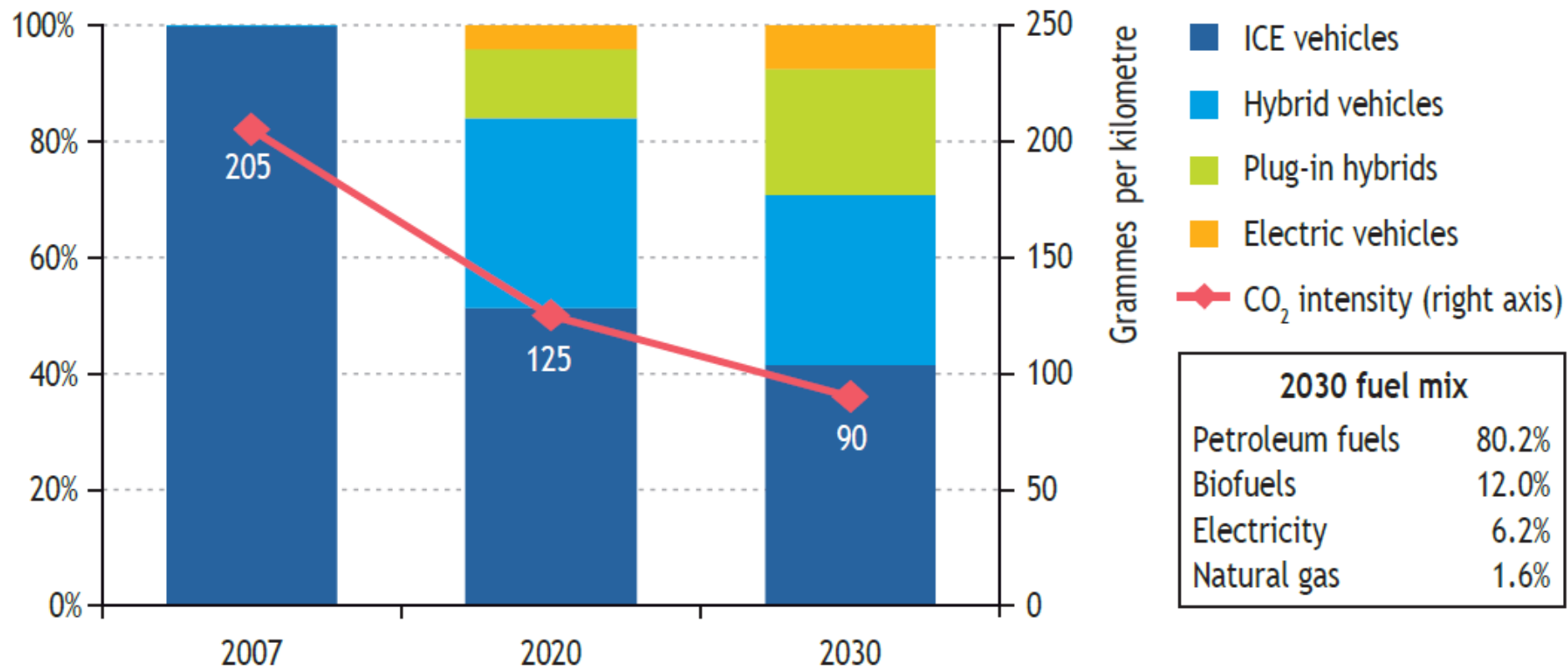
Notes: Large hydro-power projects not included.

Electric vehicle sales in US



Source: Tom Randall (2015).

No FCVs in the earlier scenario



Green investment, by sector

Select G-20 countries

