

Paris, the 2016 Election and the Future of the Energy Industry

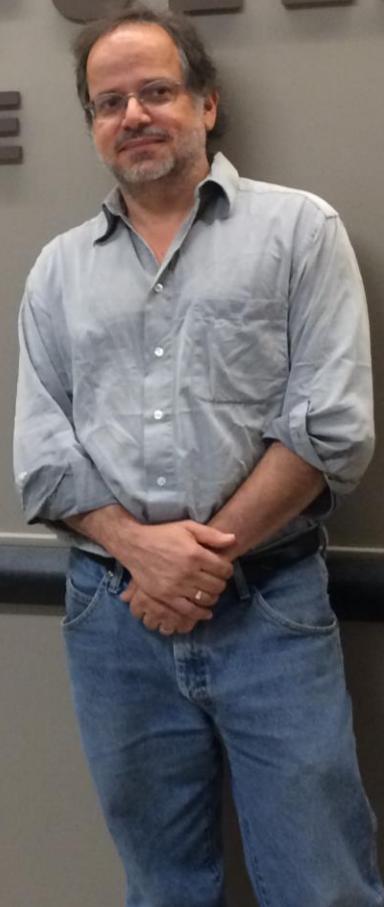
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What we'll cover today

- Who we are
- The Paris Agreement
- How - and what - is the U.S. doing?
("Mind the Gap")
- What is the potential impact of the 2016 Election?
- Short and longer term implications of a carbon-constrained world for energy businesses

**FOSSIL FUELS
CAFE**



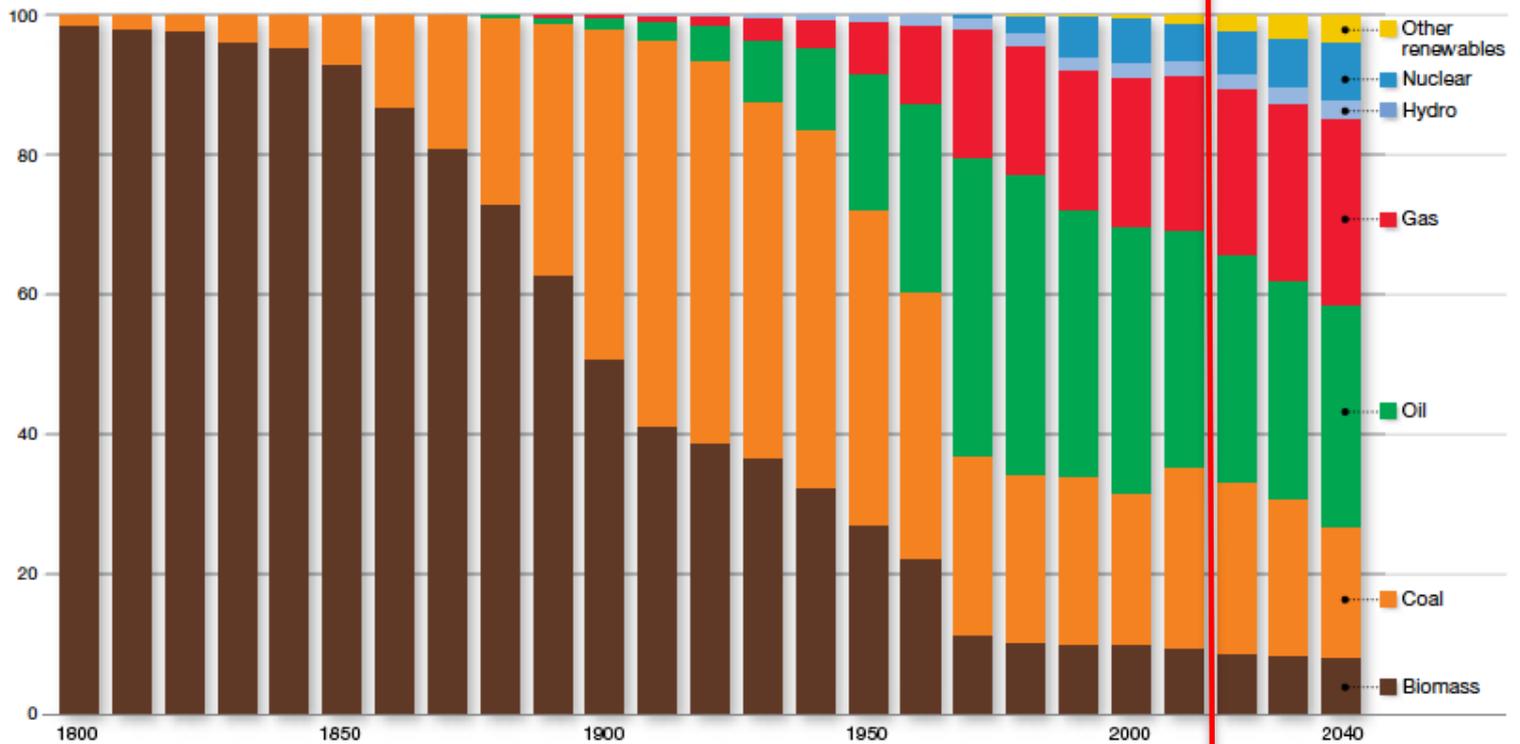


Paris

Change in the Energy Market

Global fuel mix by decade

Percent



Source: Smil, Energy Transitions (1800-1960)

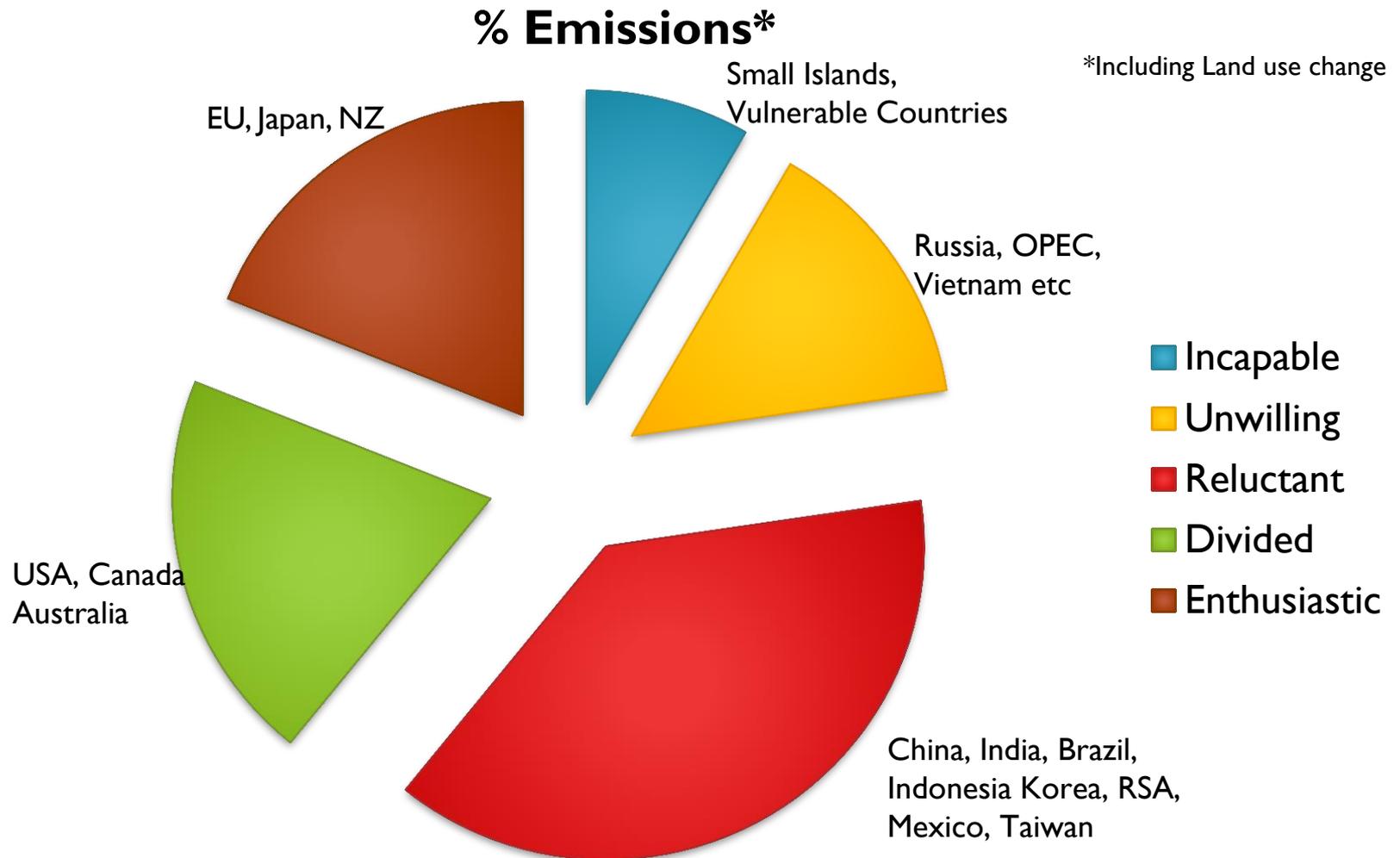
ExxonMobil Energy Outlook, 2013

What's in the Paris Agreement

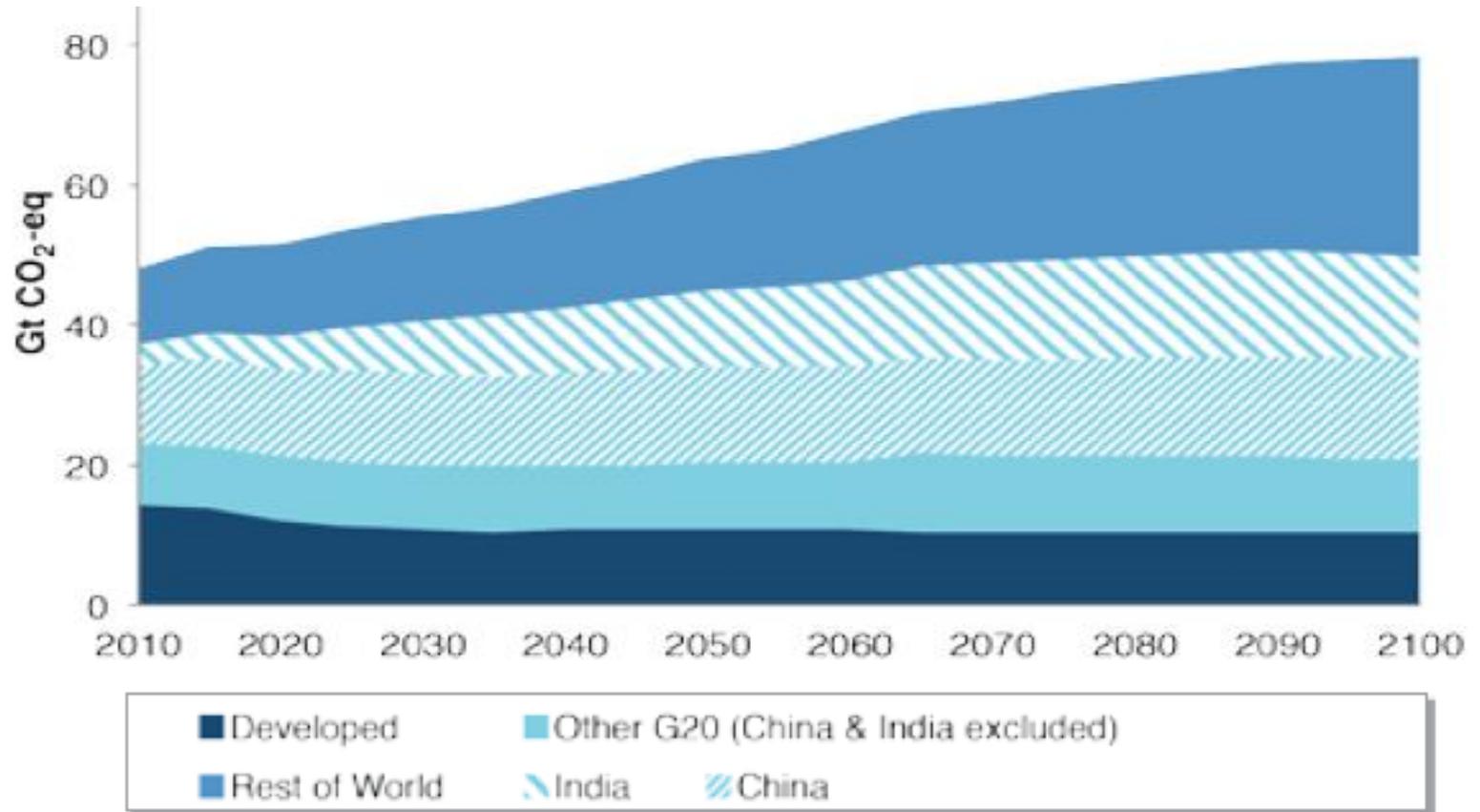
- 2 degrees C goal
 - Report on 1.5 degrees C in 2018
- Countries decide for themselves – INDCs
 - Not enough to meet 2 degree C goal
- Self monitoring and reporting (and no enforcement)
 - Standardize methodologies and encourage transparency
- \$100B / year to developing countries (2020 on)
- Focus on adaptation as well as mitigation
- Nothing in Agreement leads to liability or compensation
- Technology Transfer and Capacity Building are essential
- Aspiration for carbon neutrality in second half of century

Start of a process, not a final outcome

Power, Interest and Capability



Emissions Outlook - MIT



Includes NDCs submitted to UNFCCC in advance of Paris COP



U.S. Compliance

What will countries actually do?

The U.S. example

- The NDC targetry
- The existing measures
- What's next
- What's wrong with this picture

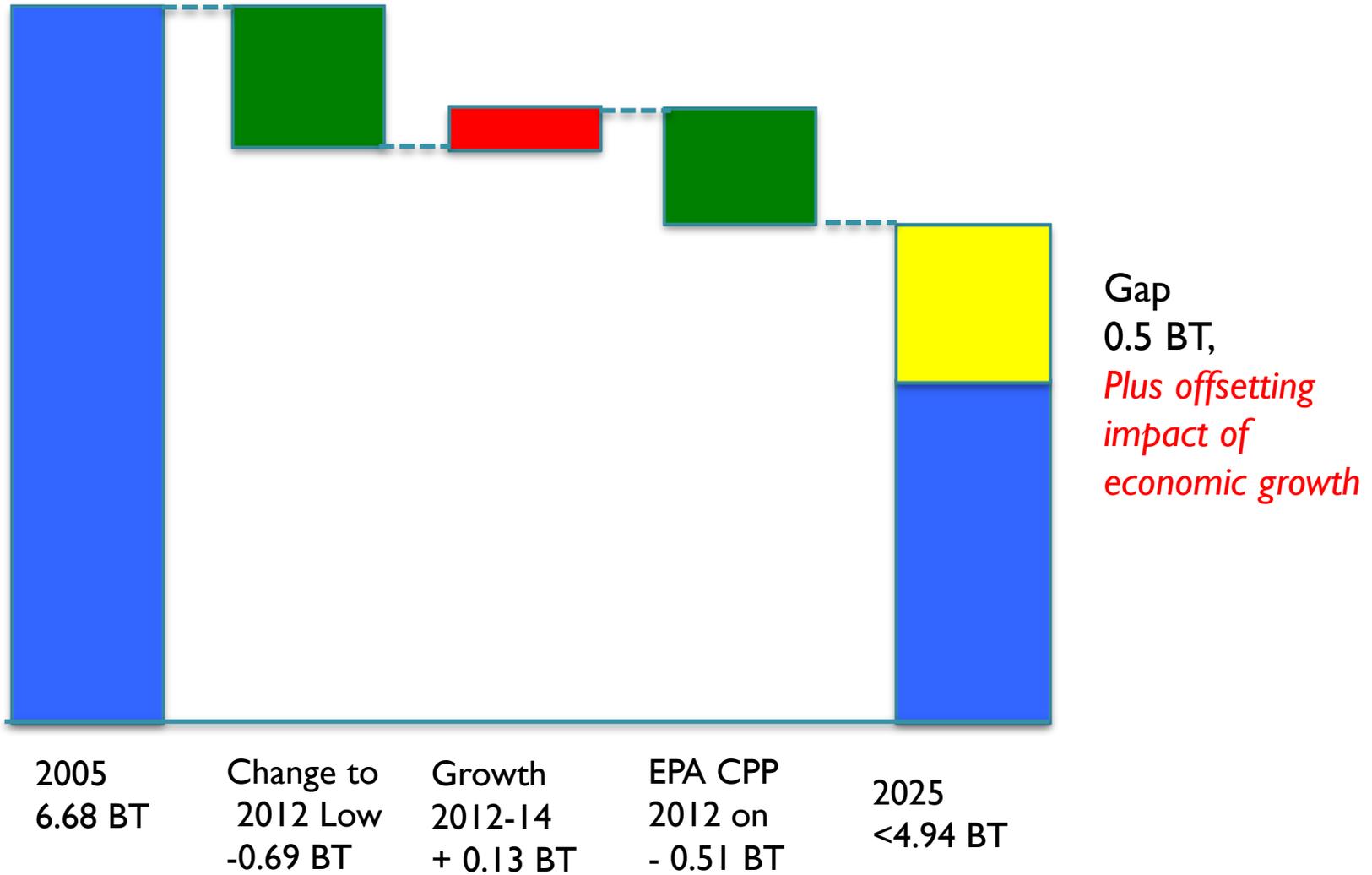
Evolution of a Commitment – U.S. Net Emissions

(All figures in MTCO ₂ e)	Original (2/15 announcement)	12/15 Report to IPCC	Implied sink (Gross-Net)	4/16 EPA GHG Inventory report	Implied sink (Gross-Net)
2005 Baseline	6223	6448	902	6680	636
2013 actual		5791	882	6040	760
2014 actual				6108	763
2025 target*	4605	4764		4943	
“On Current policy”		5379-5802	1201-908		

Implicit target now 1165MT below 2014

* 74% of 2005 emissions. (US Paris commitment is a 26-28% reduction from 2005)

U.S. NDC: CPP Not Enough



Existing U.S. measures

Target is 1,165 MMT below 2014

- Clean Power Plan (507 MMT)
 - Demand assumptions
 - Status / timetable
- Landfill *and* O&G Methane (23 MMT)
- HFC Replacement (64 MMT)
- CAFE (47 MMT)
- DOE Appliance Efficiency Standards (80 MMT)
- Federal Emissions (15 MMT)

Total: 736 MMT

- Agriculture (voluntary - 120 MMT)

Total: 856 MMT

Mind the Gap: 1,165 - 736/856 = 429 MMT or 309 MMT

What's next

More of the same:

- Industry CO₂ (marginal reductions);
- Agriculture?

AND/OR:

- Clean Power Plan 2.0
- Section 115: the “Silver Bullet”

OR:

- Carbon Tax

Issues with current US approach

- Mind the Gap:
 $1,165 - 736/856 = 429$ MMT or **309** MMT
- New regulatory programs face years of:
 - Development
 - Consultation
 - Litigation...and require regular updates
- Much of current action plan is potentially reversible by a determined President (if it survives Supreme Court challenges)
 - Paris Agreement allows any country to withdraw (after one year's notice)

Hence enviro interest in carbon tax, s115.....



The 2016 Election

The 2016 Election

A Health Warning

- Candidates' current positions reflect "Primary Mode"
 - Feasibility not a priority
- In reality, ability to act will be heavily limited by Courts and Congress
- Neither side's climate / energy agenda can be fully implemented absent control of Congress, (and perhaps not even then...)
- U.S. changes away from Paris "directions" could be reversed by next administration, and state and local level pressures will remain

The 2016 Election

- Clinton energy / climate sound bites:
 - Make US the “Clean Energy Superpower” via
 - \$60B “clean energy challenge”
 - 500 million solar panels, 33% electricity from renewables by 2025
 - 30% CO₂ reduction from 2005 by 2025, 80% by 2050
 - Reduce “energy waste” and oil consumption by 1/3 in 10 years
 - End Arctic drilling, limit development on federal lands, eliminate oil “subsidies”
 - Regulate fracking to “point of non-existence”
 - Put “coal miners and companies out of work” but provide community support

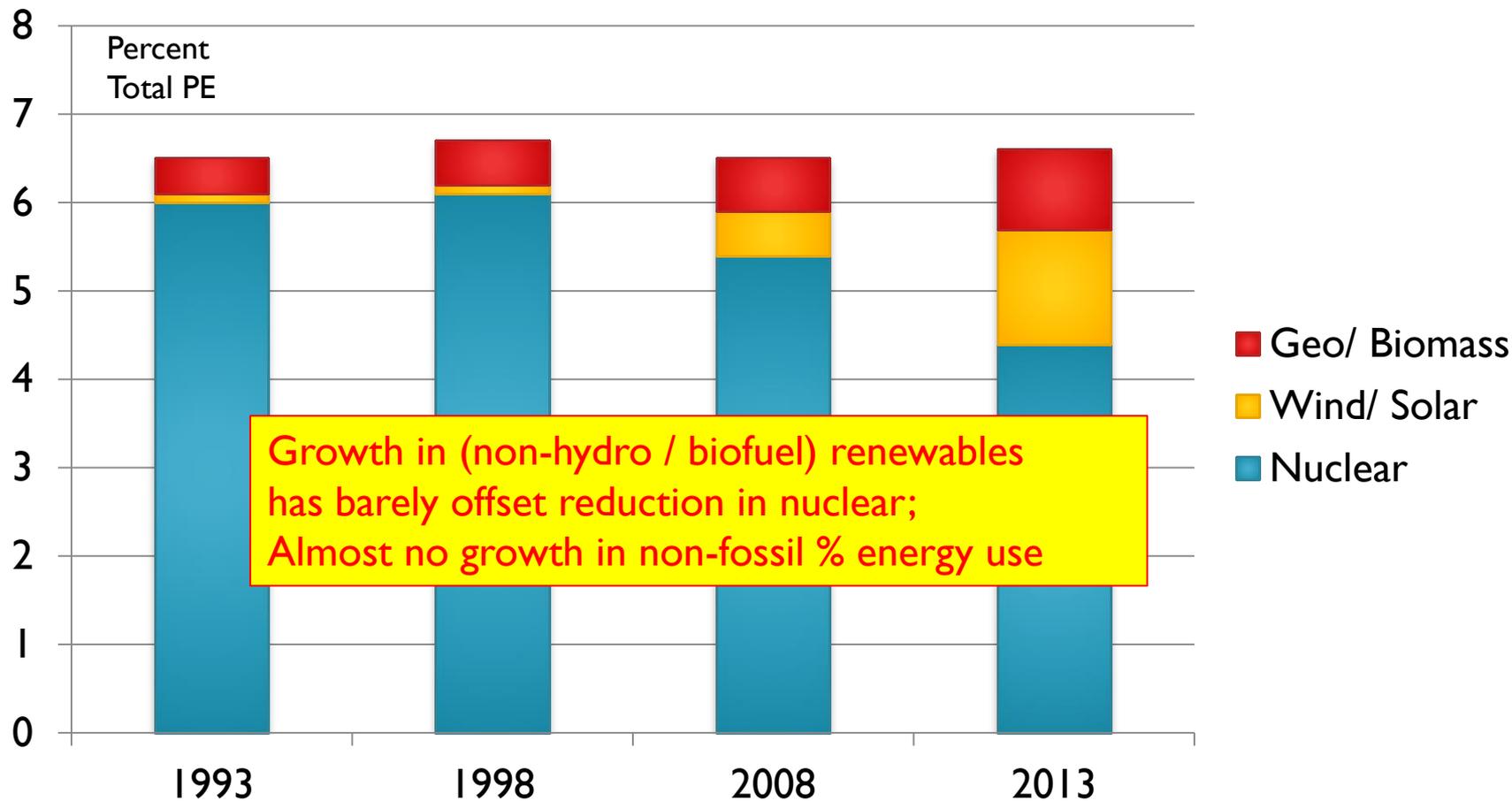
The 2016 Election

- Trump energy / climate sound bites:
 - Revoke CPP and other Obama programs (1st 100 days)
 - End institutional government hostility to fossil fuels
 - Deregulation
 - “Cancel” the Paris Agreement
 - “Energy Dominance” and “Independence”



Implications for Energy

Non-Fossil ex Hydro, Biofuels vs Primary Energy (PE) Consumption



Source: Adapted from data in BP Annual Review of World Energy, 2014

Immediate Implications of Paris for the Energy Industry

- Fossil Fuels:
 - More heat from activist agendas and low price pressures than from anything in Paris Agreement
- Renewables:
 - NDCs will support preserving favorable financial and regulatory regimes, but...
 - Maintaining recent progress and delivering on future cost improvements critical
- Nuclear:
 - Public fears, cost and liability issues will far outweigh any conceivable Paris benefit in developed countries.

Climate Issues will influence every Energy Controversy

- Extraction
- Facility Siting
- Facility Operating Methods and Permits
- Exports
- Technology and Product approvals
- Taxation
- Substitution

Fossil fuel and associated companies can factor this in via:

- Project timelines
- Shadow / Proxy pricing of carbon

Longer term implications

- A politically carbon constrained world will remain, whatever the U.S. does in the short term
 - Developed countries' regulatory environments will become more challenging for fossil fuels, especially coal
 - In rich emerging economies, expect more would-be transformational initiatives
 - In developing countries, mostly business as usual...
- In the very long term “leave it in the ground” will be a significant global issue
- Technologies to watch: Batteries, bulk storage, EVs / advanced biofuels (non LDVs), modular nuclear, CCS?

Final thoughts

- Change in the energy market is slow
- In Paris (much of) the global community showed it wanted to make change happen faster
- We expect change to be somewhat faster than historical trends, but not fast enough for even the Paris NDCs to be met
- But the change process will create a (more) challenging environment for fossil fuel industries and opportunities for their competitors...
- ...Especially if it is pursued through a regulatory agenda