The Paris Research Agenda
Findings from the First Implications of Paris Workshop

“Assessing Transformation Pathways Post-Paris and Implications for IA Research”

Snowmass, CO
July 22, 2016
Background—The Implications of Paris Project

- Started back in February 2015, focused on the research questions that might be important following an agreement.

- Partnership between those of us at PNNL and our partners at the University of Maryland
  - Use workshops to identify the key research needs.
  - Undertake relevant research to push forward the boundaries of knowledge.
The JGCRI held the first of a series of workshops in May 2016

- The first workshop, May 3-4 at the University of Maryland in conjunction with the UMD Climate Summit

- Brought together 44 international leaders from:
  - research,
  - government,
  - finance,
  - NGOs, and the private sector

- Discussed key research questions raised by the Paris agreement.
What follows are some highlights from that discussion

- How will national circumstances, institutions and goals influence the implementation of NDCs and what are their emissions implications?
- Can new international institutions make NDCs more effective?
- What are the best measures of progress toward long-term objectives—2 degrees /1.5 degrees—for the Global Stocktake?
- Can Sustainable Development Goals be achieved simultaneously with the goals of the Paris Agreement?
- What roles will technology and control of non-energy emissions play in achieving NDCs and the long-term Paris goals?
Modeling the actual policies and measures used to implement NDCs

► Many NDCs are not framed in terms of an explicit emissions limit
  ■ China’s peak emissions in 2030 goal
  ■ India’s goal of reduced emissions per unit GDP
► Such emissions mitigation goals introduce inherent uncertainty into the emissions implied by a successfully implemented NDC.

► NDCs are different than the policies and measures that are used to implement their NDC
  ■ At this point few nations have prescribed the full set of policies and measures that they intend to use to implement their

► How can NDCs be meaningfully compared?
Modeling the actual policies and measures used to implement NDCs

Key Question: How will national circumstances, institutions and goals influence the implementation of NDCs and what are their energy, emissions, land-use, trade, economic and other implications?

While economists favor taxes or cap and trade, political processes favor instruments that are politically feasible.

EMF showed that the EU 202020 policy, which uses a suite of policy tools, including cap and trade, but also regulatory instruments.

- Produced lower carbon tax
- Had higher overall costs (welfare loss)
- Different energy mix

Can new international institutions make NDCs more effective?

- Article 6 provides for
  - Cooperative approaches through “internationally transferred mitigation outcomes” (para 2)
  - Rules for carbon market accounting, particularly avoidance of double-counting (para 2 & 5)
  - Sustainable development & mitigation crediting mechanism (para 4)

- Not at all clear how this will work.
- How to trade when goals are stated in terms many different metrics?

System Design Matters

- An important research frontier is the examination of international carbon market architecture, for example.
  - The economics of offsets depends critically of the implementation mechanisms and crediting baselines
  - The design of international carbon markets when the markets cover only part of an economy's emissions needs to be examined explicitly.

What are the best measures of progress toward long-term objectives—2 degrees /1.5 degrees—for the first Global Stocktake in 2018?

If successfully implemented NDCs will reduce the likelihood of the worst climate outcomes, but without an increase in ambition, would provide only a modest possibility of limiting climate change to 2 degree.

Creating a 50-50 chance of staying below 2 degrees in 2100 means global emissions decline rapidly after 2030.

Key research question is how to know if nations individually and in aggregate are on track to take the post-2030 emissions deep dive?

And, are there technically and politically feasible paths to remain below 1.5 degrees?
Measuring progress toward 2 degrees / 1.5 degrees—for the Global Stocktake

- Tracking emissions were recognized as insufficient

- Need for leading indicators
  - E.g. committed emissions from existing plant and equipment

- Can near-term actions be designed to facilitate long-term goals?

- What strategies can nations use to address the Mid-Century problem?
  - How big are irreducible sources?
  - How big are sequestration opportunities?

Can Sustainable Development Goals (SDGs) be achieved simultaneously with the goals of the Paris Agreement?

- 17 SDGs—all extremely ambitious

Interactions will matter.
- Does local air quality go first?
- Simultaneous mitigation and adaptation—potentially highly interactive in both bioenergy and water domains
- Looking at Paris through alternative lenses—food security, energy security, urban, and so forth.

2° C and SDGs: united they stand, divided they fall?

- AMPERE project looked at interactions between a 2 degree climate goal and some SDGs
- Divided interactions into synergies and trade-offs
- Left interactions with many SDGs unexamined.

Technology and non-energy emissions

► What roles will technology and control of non-energy emissions play in achieving NDCs and the long-term Paris goals?

► Are negative emissions essential to achieving 2 or 1.5 degrees?

► Will new technologies be needed to address the Mid-Century problem?

► To what extent can technology improvement substitute for policy ambition?

► Are there limits on emissions reductions for non-CO₂ GHGs?

EMF 27 found that there are many potential technology mixes, but IMPROVED technology performance and a wider set of options lowered costs.

Moving Forward

- **Europe**—hosts NTNU and University of Oslo

- **ASIA**—host NIES

- Support for the project is open to government, private sector, finance, research and NGO institutions.

- For further information contact Jae Edmonds at jae@pnnl.gov.
DISCUSSION