Global Warming Gridlock

David G. Victor
School of International Relations
U C San Diego
Today

1. Explaining Gridlock on Global Warming
2. Some Implications of Gridlock for Radical Technology Innovation
3. Wildcards in Technology Deployment
A Kyoto Perspective on Emissions, 1990 to 2010

Source: Olivier et al (2011), EDGAR Industrial CO$_2$
A Political Perspective on Emissions, 1990 to 2010

Ranked by Public Willingness to Spend Resources to Control emissions of Warming Gases (highest to lowest)

Sources:  Pew Global Attitudes (2010), Q46; Olivier et al (2011), EDGAR Industrial CO₂
Doing the Deal: Today’s Top Emitters

- **China** (20.5%)
- **United States** (17.3%)
- **European Union** (14.2%)
- **Russia** (6.1%)
- **United States** (17.3%)
- **Japan** (3.9%)
- **Brazil** (5.1%)
- **India** (5.4%)
- **Australia** (1.7%)
- **Canada** (2.0%)
- **Korea, South Africa, Mexico, Taiwan** (5.1%)
- **Small Islands (0.9%) and other vulnerable small emitters** (7.3%)
Climate Change Legal Regime: Chaos or Opportunity?

**UN Legal Regimes**
(UNFCCC & Kyoto Protocol, formal funding mechanisms, nonbinding political agreements [e.g., Copenhagen Accord])

**Montreal Protocol**
(regulation of ozone-depleting gases that also affect climate warming)

**Subnational Action**
(e.g., California’s emission trading system w/int’l offsets; subnational procurement rules)

**Bilateral Initiatives**
(e.g., Norway-Indonesia; US-India; UK-China)

**Expert Assessments**
(IPCC; national assessments)

**Adaptation Initiatives**
(e.g., programs by UN agencies and multilateral development banks [MDBs])

**Clubs**
(e.g., MEF, APP, G20, G8, G8+5)

**Multilateral Development Assistance**
(e.g., “mainstreaming” climate at MDBs; World Bank prototype carbon fund; clean energy & adaptation funds)

**Intellectual Property and Investment Rules**
(e.g., clean energy provisions in bilateral investment treaties)

**Nuclear Technology**
(e.g., nuclear suppliers’ group provisions to accommodate US-India nuclear partnership)

**Geoengineering Governance**
(e.g., ocean dumping rules for iron fertilization; possible regulation under Convention on Biological Diversity or new treaties)

**Financial Market Rules**
(e.g., regulation of cross-border emission trading)

**International Trade Regime**
(e.g., possible GATT/WTO action to accommodate border tariff adjustments)

Source: Keohane and Victor (2011)
Practical Alternatives to Kyoto

1. Small Groups (“clubs”) rather than universal
2. Focused on high leverage issues rather than “comprehensive”
3. Fragmented rather than integrated
4. Focused on practical “pledges” rather than abstract goals)
5. Engagement with “reluctant” countries
Fragmentation of Carbon Markets

Sources: Danny Cullenward and David Victor
The Crisis in Clean Energy

Stark Realities of the Renewables Craze

David G. Victor and Kassia Yanosek

Sources: IEA; BEA; DOE Budget (2009-2011 estimates); ILAR/UCSD analysis
RD&D Proposals: Climate Group (red circles), Gates/Immelt (yellow diamond), Obama 2010 budget vision (green triangle), IEA (blue square)
Is Learning Forever?

Source: GEA (2011) via Goldemberg
Costs are turning back up after a sharp decline from the mid-'08 peak.

The IHS CERA 1Q2011 Downstream Capital Cost Index reached a record high, exceeding 2008.
Illustration: Capex for New Nuclear

Changing the albedo is “easy” and “cheap”...

...and many nations could do this unilaterally.