International Climate Change Policy II: Implementation of Paris and Trump-Biden Years

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Key Challenge for Long-Term Success of Paris Agreement

- **Two necessary conditions for ultimate success of Paris Agreement:**
  - Adequate scope of participation – achieved "more or less"
  - Adequate ambition of the individual national contributions
- **Element of Paris Agreement that fostered broad scope of participation** (97% versus 14% under Kyoto) – namely, NDCs are anchored in national circumstances & domestic political realities – **means that individual contributions may not be sufficient** (global commons problem).
- So, **are there ways to enable and facilitate *increased ambition* over time?**
- ***Linkage* of regional, national, and sub-national policies can be *part* of the answer** – connections among policy systems that allow emission reduction efforts to be redistributed across systems
  - Linkage is typically framed as between cap-and-trade systems…
  - … but regional, national, and sub-national policies will be highly *heterogeneous*

Three Major Categories of Heterogeneity

- **Heterogeneous Instruments**
  - Cap-and-Trade
  - Tradable Performance Standard
  - Emission Reduction Credit (Offset)
  - Tax
  - Performance Standard
  - Technology Standard

- **Heterogeneous Jurisdictions/Geographic Scope**
  - Regional , National, and Sub-National
  - Status under the Paris Agreement: Party/non-Party

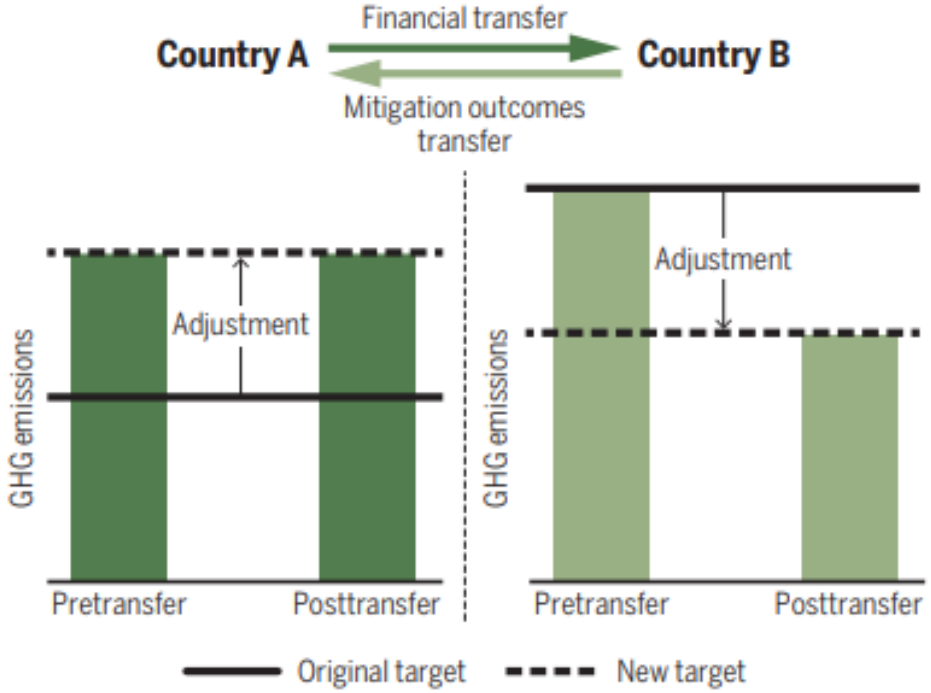
- **Heterogeneous NDC Targets**
  - Hard (mass-based) emissions cap
  - Relative mass-based emissions cap (relative to BAU)
  - Rate-based emissions cap (per unit of economic activity or per unit of output)
  - Other, non-emissions caps, such as penetration of renewable energy sources
  - ***Also*,** differences in base year, target year, sectors, GHGs, GWPs, & conditionality

Linkage and the Paris Agreement

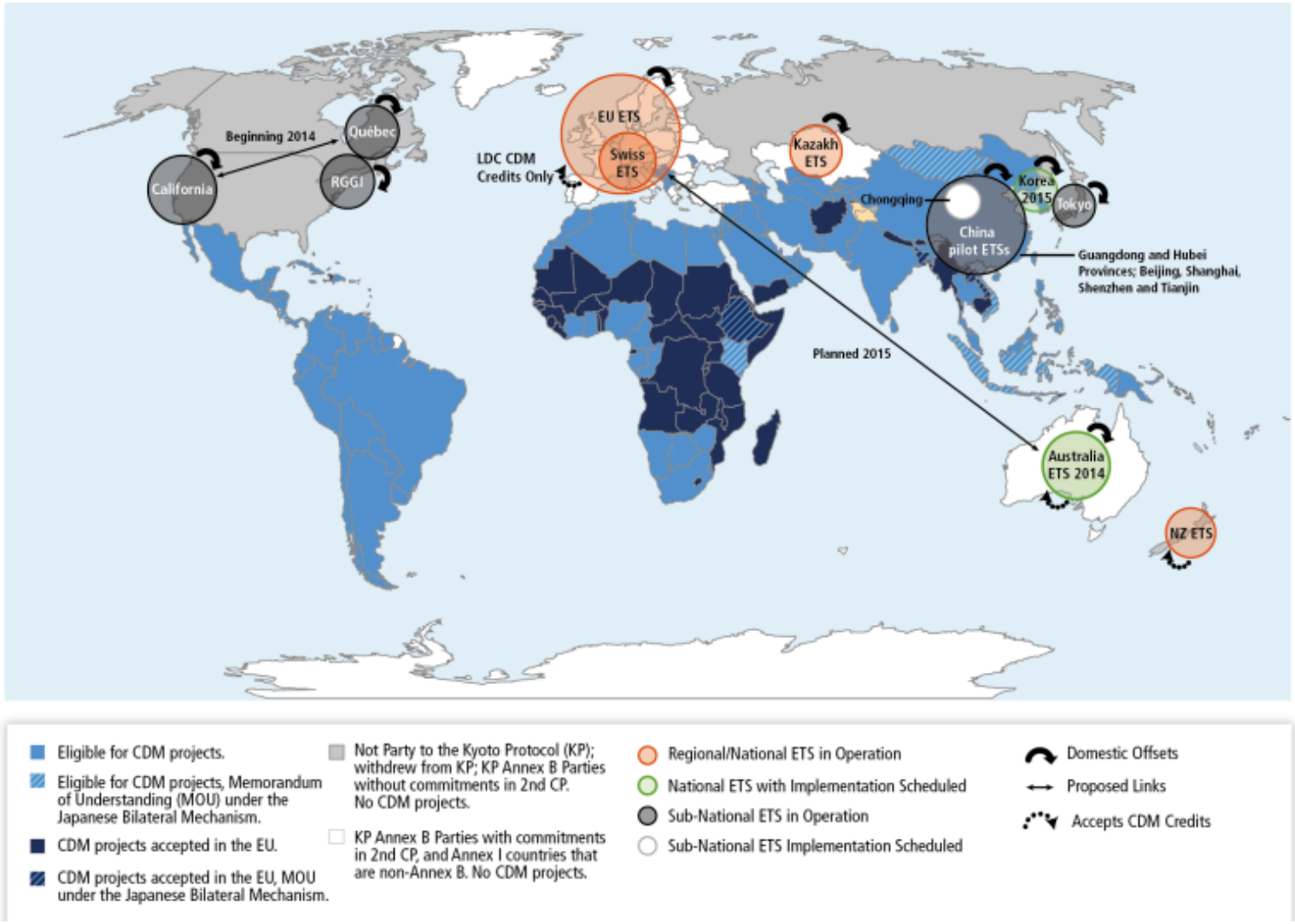
- ***Three*** **distinct but closely related levels of action**
  - **National (or regional) governments can *establish emission-reduction policies*,** including carbon taxes, cap-and-trade systems, and performance standards
  - **These jurisdictions can *link* their policy instruments** through mutual recognition of permits, allowances or credits (bilateral agreements).
    - This allows trade of these units across international borders
    - Facilitates lower-cost of achievement of aggregate target
  - **But such transfers of emission reduction responsibilities & actions need to be *correctly counted toward achievement* of respective NDCs under Paris Agreement.**
    - This is where Article 6 of the Paris Agreement comes in!

Linkage and the Paris Agreement: Article 6.2

- ***Internationally Transferred Mitigation Outcomes & Corresponding Adjustments …***
  - … can function as accounting mechanism for *international private-sector* exchanges
- **ITMOs as *units* of accounting for Corresponding Adjustments,**
  - … *not* a medium of exchange for government-government trades.
- **Otherwise**, Article 6.2 would become equivalent to Kyoto Protocol's Article 17 (international emissions trading), …
  - … and be likely to fail as that did, because governments are *not* cost-minimizing agents, and *lack requisite information* even if they were (Hahn & Stavins 1999).



Linkages Exist Among GHG Trading Systems

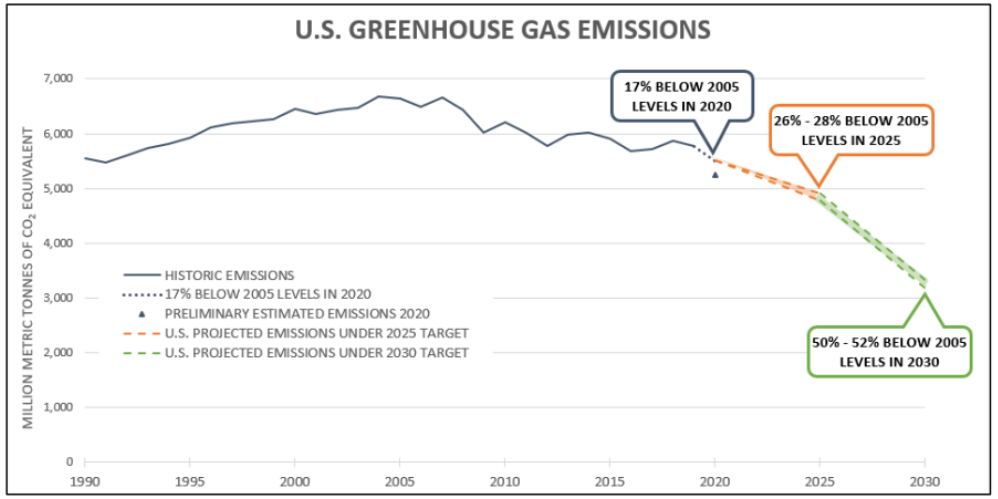


Is Linkage Among Heterogeneous Policies Feasible?

- **Most features of heterogeneity *do not present insurmountable obstacles* to linkage**,
  - but *some present very significant challenges or barriers*
  - Mehling, Metcalf, and Stavins. "Linking Climate Policies to Advance Global Mitigation." *Science* 359, 2018
- and all indicate ***need for specific accounting guidance*** to avoid double-counting
  - Schneider, Duan, Stavins, Kizzier, Broekhoff, Jotzo, Winkler, Lazarus, Howard, and Hood. "Double counting and the Paris Agreement rulebook." *Science* 366, 2019
- **Article 6.2 provides an obvious home for this accounting guidance**.
- But **policies undertaken by individual Parties** to Agreement are **key** …

A New U.S. Administration and New Challenges

- **President Biden initiated process on January 20th of *rejoining Paris Agreement*** – U.S. was again a Party on February 19th
  - That was the *easy* part.
  - Hard part was producing *new Nationally Determined Contribution* (NDC) – statement of how and how much U.S. greenhouse gas (GHG) will be reduced by 2030.
- ***Challenging* because new NDC had to meet *two* necessary conditions:**
  - First, must be *ambitious enough* to satisfy domestic greens and some key countries
    - Minimum: more ambitious than Obama NDC (26-28% below 2005 by 2025)
- **Look at *ambition* of the U.S. and other NDCs) …**

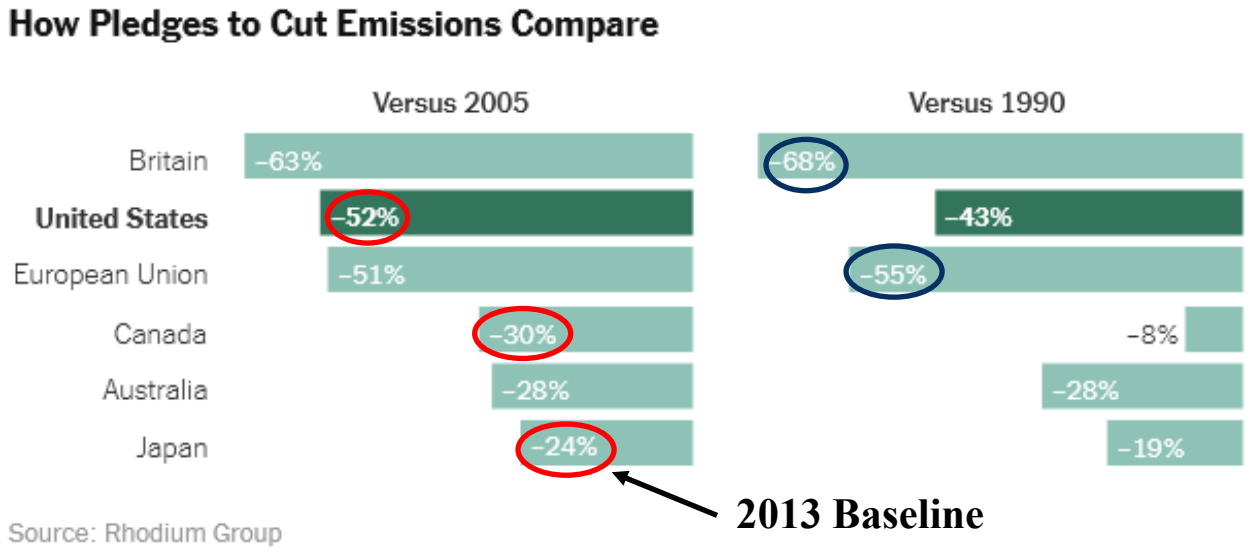


United States Historic Emissions and Projected Emissions Under 2030 Target

Recent NDCs of Top Emitters (Quantitative Emissions Targets)

1. China	NDC 65%↓ CI 2005→2030	
2. USA	**NDC: 50-52%↓ CO_2 2005 → 2030**	**[Compare with Obama NDC]**
3. EU	NDC: 55%↓ CO_2 1990→2030	
4. India	NDC: 45%↓ CI 2005→2030	
5. Russia	NDC: 30%↓ CO_2 1990→2030	[No New Commitment]
6. Indonesia	NDC: 32% below BAU 2030	
7. Brazil	NDC: 40%↓ CO_2 2005→2030	
8. Japan	NDC: 46%↓ CO_2 2013→2030	
10. Canada	NDC: 40-45%↓ CO_2 2005→2030	
13. South Korea	NDC: 40%↓ CO_2 2018→2030	
15. Australia	NDC: 43%↓ CO_2 2005→2030	
18. UK	NDC: 68%↓ CO_2 1990→2030	

Comparing National Pledges with 2005 vs 1990 Baseline Years



- **Countries choose their baselines strategically**

Note: Net CO_2e (including land use and forestry, but not international aviation and shipping)

The U.S. Challenge (continued)

- So, **U.S. challenge was that the new NDC must meet *two necessary conditions*:**
  - Must be ***ambitious enough*** to satisfy domestic green groups and some key countries
    - This *first of two* necessary conditions satisfied by U.S. NDC of 50-52%↓ CO_2 2005→2030
  - **And must be *credible*** – achievable with *reasonably anticipated policy actions*

- **Examine this** by reflecting on the climate talks in Glasgow, Scotland in December, 2021 – *COP26* …

Major Issues at COP26 (Glasgow, 2021)

- **For the Press**: Did the old and the new **NDCs add up** to consistency with the Paris Agreement's 2 degree C target, let alone the 1.5 C aspirational target?
  - Outcome: 3.7 C before Paris → 2.7 C w/Paris NDCs → 2.4 C w/updated NDCs → low as 1.8 C w/additional 2050 statements? (*But just targets, not policies/actions*)
- **For most delegations (i.e, developing countries) – Finance** – achieving the $100 billion/year commitment (& more) for adaptation, etc.
    - ➢ Outcome: Glasgow Climate Pact *"urges" countries to double commitment*
  - Loss & Damage
    - ➢ Finessed in Paris Agreement: Unmitigated/unadapted impacts on the most vulnerable countries are *important*, but *not* a basis for compensation or legal liability
    - ➢ Glasgow Outcome: U.S. & EU blocked proposal for *new fund* for loss and damage payments; instead set up a dialogue for research and *discussion* at future COPs (Greta Thunberg: "bla, bla, bla")

Issue for Everyone

- The "Elephant in the Room" for everyone – delegates, civil society, & press

- **Is the U.S. NDC (50-52% below 2005 by 2030) achievable with *reasonably anticipated policies?***
  - ***Probably not***
  - *But outcome*: all three groups – delegates, civil society, & the press – were so happy to have Biden instead of Trump administration, with U.S. rejoining Paris, that …
  - … there was a remarkable *"willing suspension of disbelief"* by delegates and others,
  - … and this issue was hardly discussed in polite conversation.

- **Why did I say that U.S. NDC was *probably not* achievable?**

Was/is the U.S. NDC (50-52%↓ CO_2 2005→2030) **credible?**

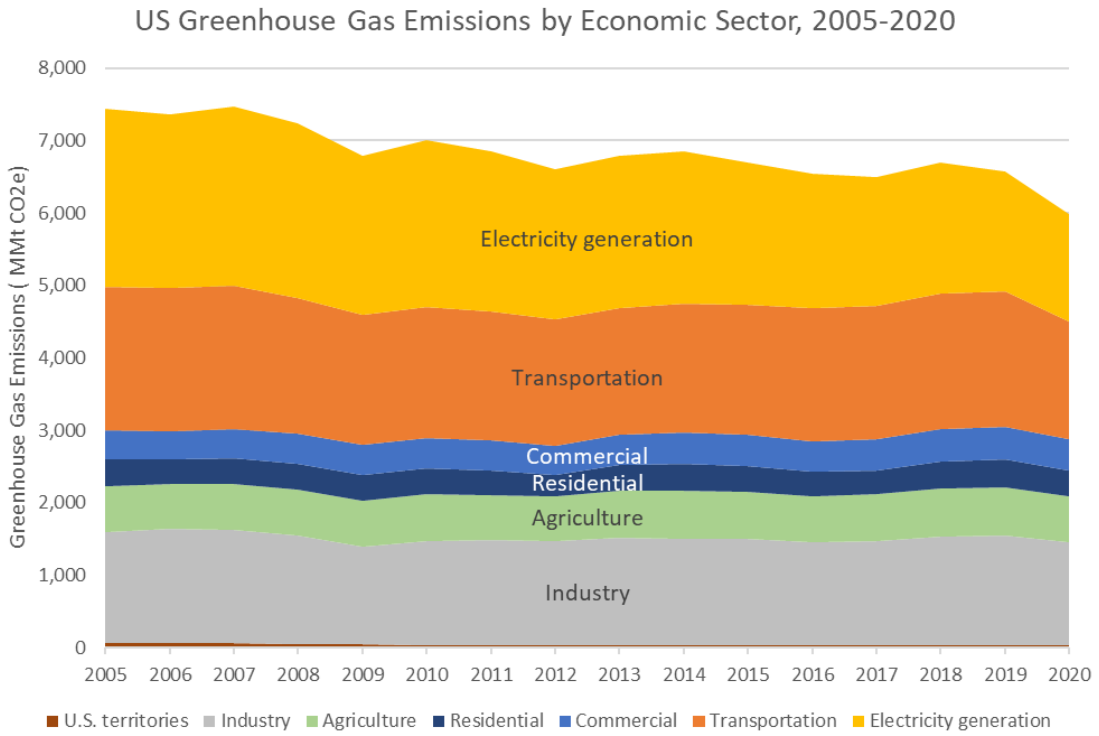
- **Is this achievable with *reasonably anticipated policy actions?*** The only way this could be met was with aggressive new legislation
  - But Senate requires *60* votes, unless "Budget Reconciliation" procedure is used (but can apply only for limited types of legislation, and *still need 51 votes*)
  - Prospects for major, *comprehensive climate legislation* were dim.
- ***But non-climate legislation* can reduce GHG emissions**
  - *Bipartisan Infrastructure Act*: electricity transmission (for greater reliance on renewable sources and greater penetration of electric vehicles), transportation, energy efficiency, existing nuclear plants, etc.
- **Other, *truly bipartisan climate legislation* could be politically feasible**
  - Tax incentives (that is, ***subsidies***): wind & solar power, carbon capture & storage, technology initiatives, electric vehicle rebates, etc. (some above)
- **And Biden administration could turn to *regulatory approaches* …**

Regulatory Approaches

- ***Executive Orders*** to reverse Trump regulatory rollbacks
  - *Reinstate and surpass* Obama's CAFE standards (for motor vehicles)
  - *Reinstate* Obama rule re methane leaking from wells & pipelines
  - *New rule* under December 2020 legislation will implement in USA the Kigali Amendments (2016) for CFCs to the Montreal Protocol (1987)
  - *New rule* on methane (later)
  - *Recalculate* "Social Cost of Carbon" ($50→$1→$51→$190)
- **But new regs *more likely to be challenged successfully* than during Obama years**
  - There are 245 Trump-appointed Federal judges (> ¼ of total) – see SCC above!
  - *Supreme Court* 6-3 conservative majority
    - Favors literal reading of statutes, less flexibility to departments & agencies
    - In effect, modified/overruled Chevron Doctrine (under which Federal courts defer to agencies when Congress was not explicit)
- So, **what has the Biden administration been able to *accomplish with legislation*** (beyond the Bipartisan Infrastructure Act)? …

Reminder: Biden Target for 2005-2030 was/is 50-52%

- By 2020, emissions were down 20% compared with 2005 level
- Reductions to 2020 impressive, but not even halfway to 2030 target

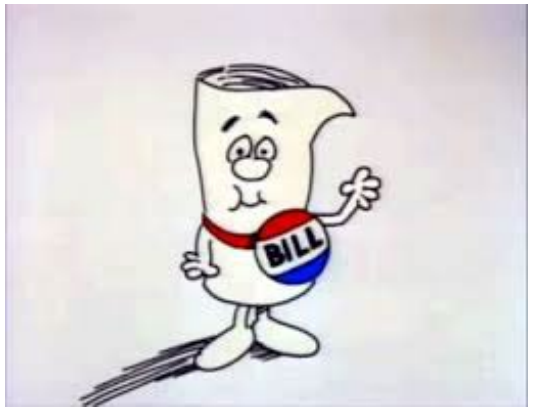


Electricity generation	-39.7%
Transportation	-17.6%
Commercial	4.9%
Residential	-2.4%
Agriculture	1.4%
Industry	-7.2%
Total	-19.5%

Source: Inventory of U.S. Greenhouse Gas Emissions and Sinks | US EPA

In 2021, Biden Announces 2050 *Net-Zero Goal*

But other demands from various parts of the political spectrum!



U.S. Historic and Projected GHG Emissions under the 2050 Net-Zero Goal

Source: Biden White House, The Long-Term Strategy of the United States: Pathways to Net-Zero Greenhouse Gas Emissions by 2050, 2021.
Available: https://www.whitehouse.gov/wp-content/uploads/2021/10/US-Long-Term-Strategy.pdf

The Inflation Reduction Act (IRA)

- **Inflation Reduction Act is the *largest climate mitigation investment* in U.S. (possibly world) history**
  - Almost *exclusively government subsidies* (see previous discussion of limitations of subsidies)
  - Can accelerate growth in *renewables, energy storage, decarbonized fuels*, and *electrification*
  - *Promotes* U.S. *manufacturing* and *jobs*
  - Focuses on *environmental justice*, support for disadvantaged communities
- **Expected to help achieve *40% below 2005 by 2030***
- ***Ex ante* estimates of cost** ~ *$370 billon*, but great *uncertainty* about degree to which households and businesses will take up different tax credits (will exceed $1 trillion due to take-up rates)

Climate & Energy Provisions in the IRA

Production Tax Credits

Clean Electricity

Up to 1.5 cents/kWh of renewable or zero carbon electricity

Advanced Manufacturing

Credits for solar, wind, and battery components, inverters, & critical minerals

Clean Hydrogen

Up to $3/kg of clean hydrogen produced

Nuclear Power

Up to 1.5 cents/kWh of electricity produced from nuclear energy

Investment Tax Credits

Clean Electricity and Energy Projects

Up to 30% of investment in certain renewable or low-carbon energy projects including energy storage

Geothermal Heating

Up to 30% of investment in geothermal heat pump projects

Advanced Energy Projects

Up to 30% of investment in industrial heat, CC, recycling, waste reduction and energy efficiency and other

Tax Credit Bonuses

Domestic

Up to 10% bonus for meeting domestic manufacturing requirements

Energy Communities

Up to 10% bonus for projects located in brownfields or communities in fossil fuel industry

Low-Income communities

Up to 10% bonus projects located in low-income or tribal communities; Up to 20% for projects in low-income residential buildings

Electric Transmission

Financing

$2B to DOE for loans financing lines in national interest

Siting

$760M to DOE for grants to states to help w/ siting lines

Planning

$100M for planning & modeling interregional & OSW Tx

Carbon Capture Tax Credits

Industrial Facilities & Power Plants

Up to $85/$tCO_2$ captured and stored; up to $65/$tCO_2$ utilized

Direct Air Capture Facilities

Up to $180/$tCO_2$ captured and stored; up to $130/$tCO_2$ utilized

Fuel Tax Credits

Clean Fuels

Up to $1/gallon of low-carbon transportation fuel produced

Sustainable Aviation Fuel

Up to $1.75/gallon of SAF produced

Residential Tax Credits

Clean Energy

Up to 30% of investment in residential solar, wind, geothermal, biomass, and battery storage projects

Energy Efficiency

Up to 30% of investment in projects that improve energy efficiency

Other Spending

Advanced Industrial Projects

$5.8B to DOE for projects that reduce emissions of energy-intensive industries

GHG Reduction Fund

$27B in grants for seed capital for local projects to mitigate climate change

Rural Electricity

$9.7B to USDA for rural electric cooperative financial assistance

Clean Vehicle Tax Credits

Charging Stations

Up to 30% of cost of charging or alternative fuel station

Used Vehicles

Up to $4k for used EV or plug-in hybrid

Consumer Vehicles

Up to $7.5k for EV, hybrid, or HFCV

Commercial Vehicles

Up to $40k for purchase of clean vehicles over 14,000 lbs, up to $7.5k for anything less

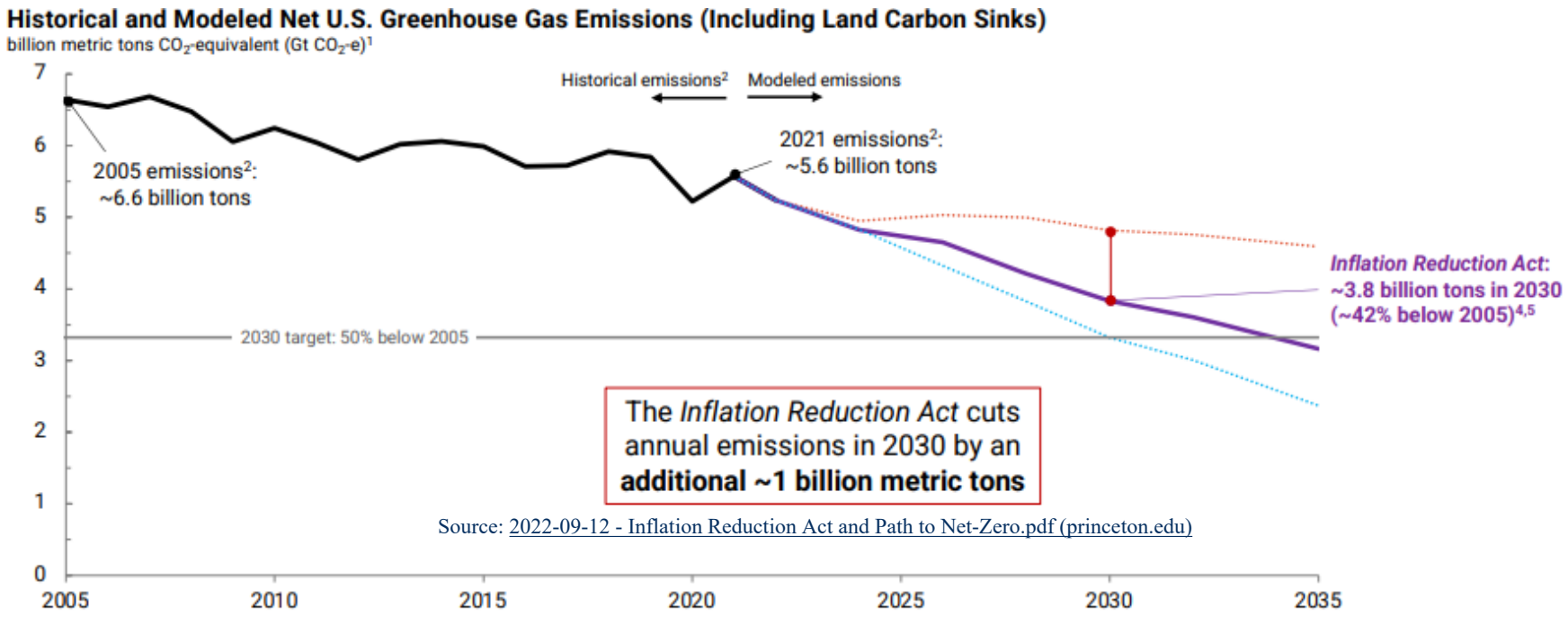
Oil and Gas

Methane Fee

$900/tonne fee on excess methane, increasing up to $1,500/tonne

Preliminary Analysis of Impacts of IRA

- **Analysis suggests** IRA will reduce GHG emissions *42% below 2005 by 2030* (not 50-52%)
- Much of this will be driven by accelerated *clean electricity deployment* and *electric vehicle adoption* (**diffusion, *not* necessarily innovation**)
- **Policy may also accelerate innovation in industrial sectors**



Source: 2022-09-12 - Inflation Reduction Act and Path to Net-Zero.pdf (princeton.edu)

Reminder re Use of Subsidies

- **It is *politically appealing* to reduce GHG emissions by *subsidizing* clean energy** (rather than using taxes, cap-and-trade, performance standards, or technology standards), …
  - … because politicians *prefer* to give out benefits rather than costs to voters.
- But market-clearing price for *energy* is cut, so ***energy demand can increase***
- Also, it's ***necessary to raise tax revenue*** to pay for the subsidy (so, DWL)
- And it can mean a ***great deal of revenue***, because not only marginal units receive the subsidy,
  - but all of the *infra-marginal* ones as well – those who "would have done it anyway" (as we saw w/energy efficiency)
- **In short, the subsidy approach is *politically attractive*, but *not efficient or cost-effective***
- *Next time, back to international climate policy …*

Key Take-Aways

1. There are two necessary conditions for success of Paris Agreement:
   - Adequate scope of participation (achieved)
   - Adequate ambition of individual national targets and actions
2. International linkage can play an important role re ambition
   - Effective linkage feasible among heterogeneous policies under Article 6
3. Ultimate success depends upon national policies
4. U.S. policy outlook has changed significantly under current administration
   - Significant political challenges → Inflation Reduction Act of 2022
   - Subsidies redux