

CD-LINKS

Quantifying current climate and energy policies in G20 countries with Integrated Assessment Models

Heleen van Soest

On behalf of CD-LINKS consortium



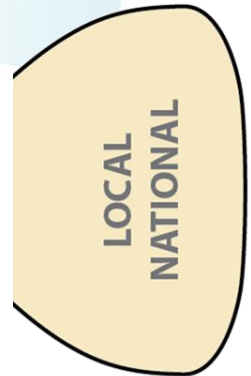
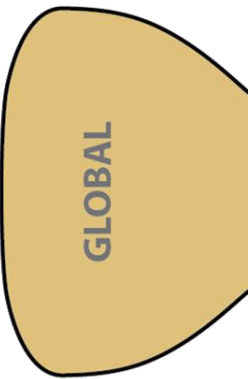
This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 642147.



Integration of global and national perspective

Global boundary conditions,
e.g. international feedbacks, techno-economics,
commodity prices

**Global transformation
pathways**

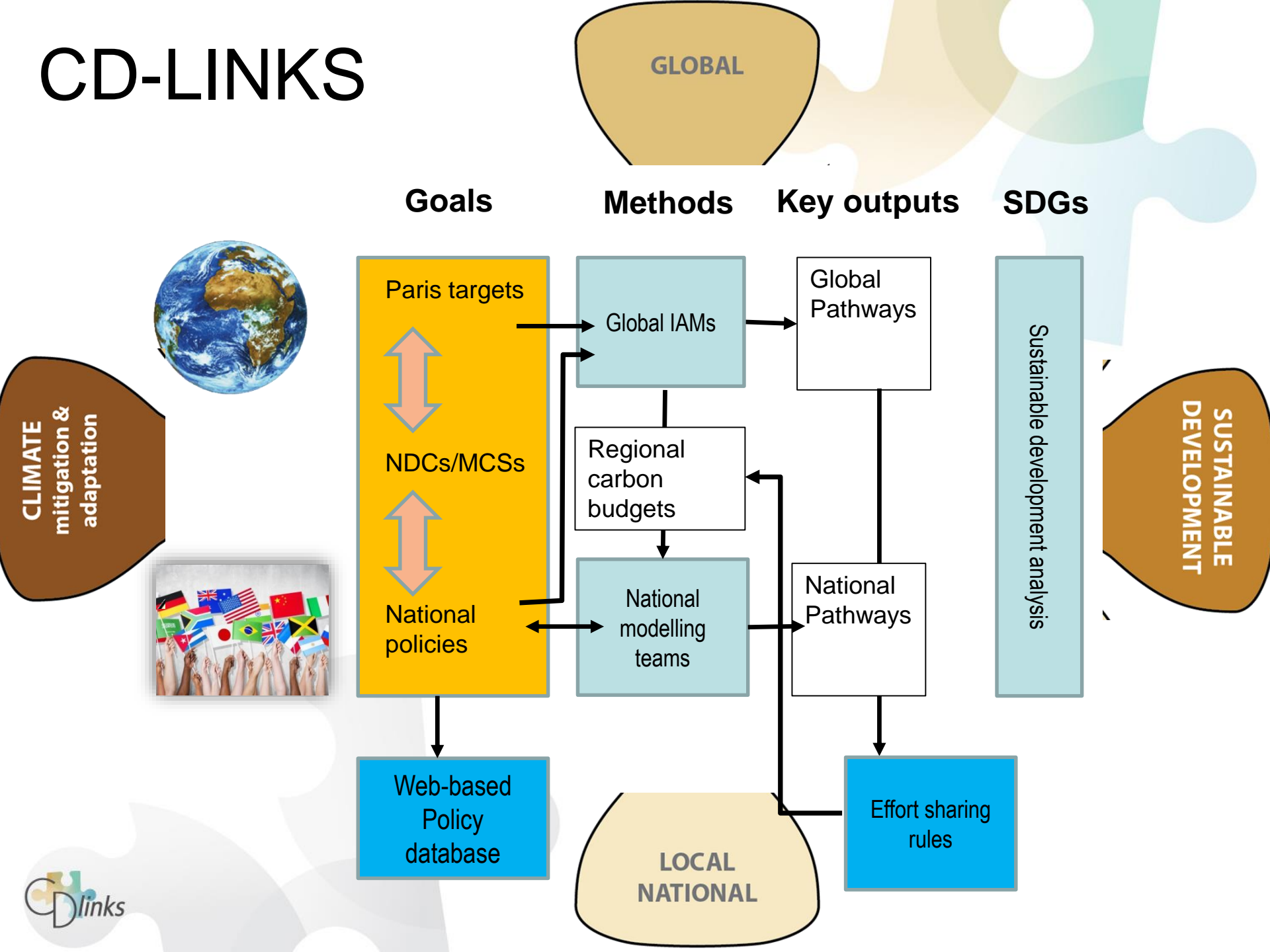


Improved representation of
national circumstances and
policy priorities

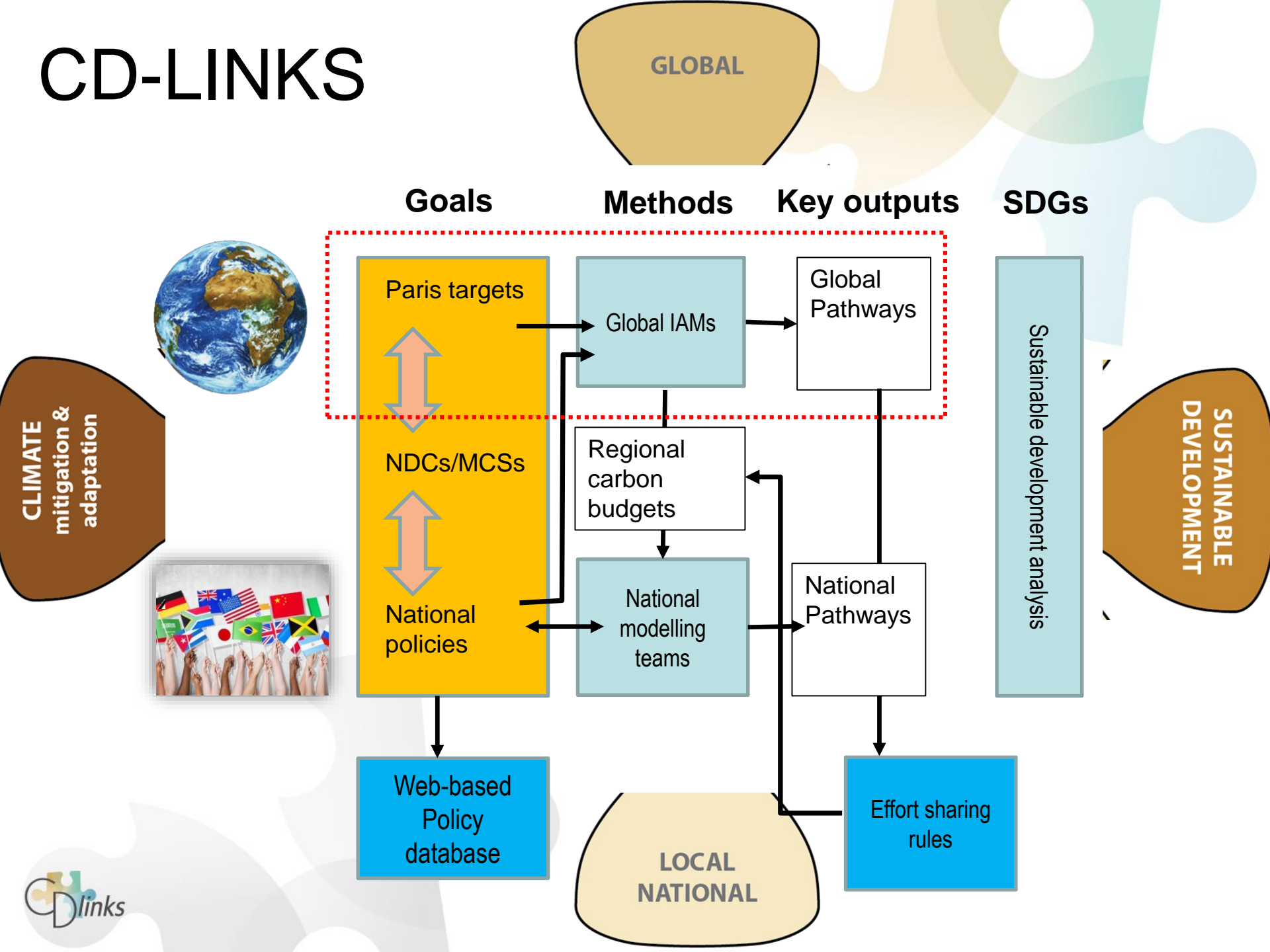
**National low-carbon
development pathways**



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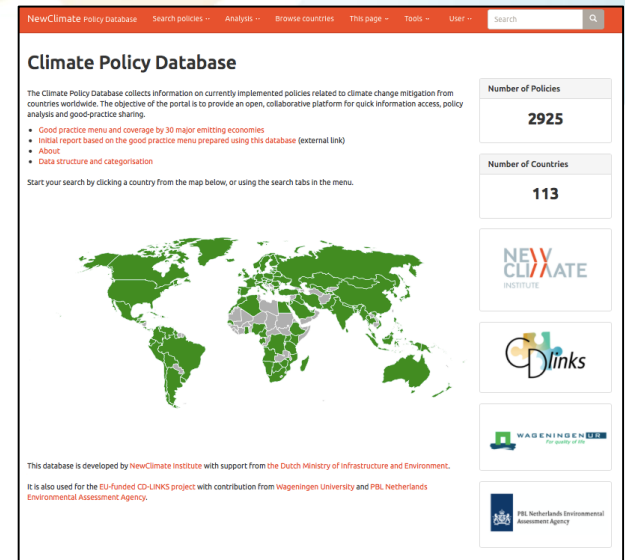


CD-LINKS



Assessing progress of countries in achieving NDCs

- Collection of information on national policies in different countries relevant for GHG emissions
 - High impact policies (implemented if adopted by government; planned if not)
 - Climate- and energy strategies
 - Policy instruments (e.g. ETS, FIT)
- Review with country representatives
- Publication in on-line database:
<http://www.climatepolicydatabase.org>
 - Open, collaborative platform



The screenshot shows the homepage of the Climate Policy Database. At the top, there is a navigation bar with links for 'NewClimate Policy Database', 'Search policies', 'Analysis', 'Browse countries', 'This page', 'Tools', and 'User'. A search bar is located on the right side of the navigation bar. Below the navigation bar, the main heading is 'Climate Policy Database'. A brief description states: 'The Climate Policy Database collects information on currently implemented policies related to climate change mitigation from countries worldwide. The objective of the portal is to provide an open, collaborative platform for quick information access, policy analysis and good-practice sharing.' There are four bullet points: 'Good practice menu and coverage by 30 major emitting economies', 'Initial report based on the good practice menu prepared using this database (external link)', 'About', and 'Data structure and categorisation'. Below this, it says 'Start your search by clicking a country from the map below, or using the search tabs in the menu.' A world map is displayed, with several countries highlighted in green. On the right side, there are two summary boxes: 'Number of Policies' with the value '2925' and 'Number of Countries' with the value '113'. Below these are logos for 'NEW CLIMATE INSTITUTE', 'CD-LINKS', 'WAGENINGEN UNIVERSITY', and 'PBL Netherlands Environmental Assessment Agency'. At the bottom, there is a small text block: 'This database is developed by NewClimate Institute with support from the Dutch Ministry of Infrastructure and Environment. It is also used for the EU-funded CD-LINKS project with contribution from Wageningen University and PBL Netherlands Environmental Assessment Agency.'

Policy coverage

Sectors

- General
- Electricity and heat
- Industry
- Buildings
- Transport
- Agriculture and forestry

Policy type

- Changing activity
- Efficiency
- Renewables
- Nuclear/fuel switch/CCS

Policy objective

- Mitigation
- Adaptation
- Energy security
- Energy access
- Air pollution
- Land use
- Food security
- Water
- Economic development

United States CDlinks project

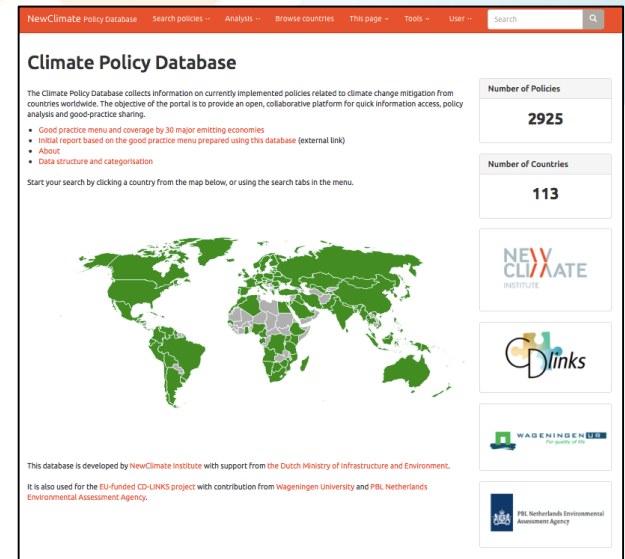
The matrix below describes the coverage of the good practice policy menu (details are provided [here](#)) by climate policies currently implemented inside the country. For a list of climate policies in this country with high impact on GHG reduction, see the table at the bottom.

■ - Implemented policies exist in the database
■ - No implemented policies exist in the database
■ - Unknown
 Numbers in brackets indicate number of policies in this area

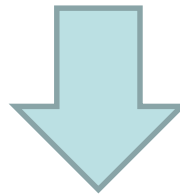
	Changing activity	Energy efficiency	Renewables	Nuclear or CCS or fuel switch	Non-energy	
General	Climate strategy (1)					
	GHG reduction target (2)					
	Coordinating body for climate strategy					
	Support for low-emission RD&D (2)					
Electricity and heat		National energy efficiency target	Renewable energy target			
		Support for highly efficient power plants (including codes and standards and fiscal/financial incentives) (14)	Renewable energy target for electricity sector (1)	CCS support scheme, including fiscal/financial incentives and infrastructure investment (4)		
		Reduction obligation schemes (2)	Support scheme for renewables (including green certificates, fiscal/financial incentives, obligation schemes, net metering or direct investment) (19)			
			Grid infrastructure development (1)			
			Sustainability standards for biomass use			
		Overarching carbon pricing scheme or emissions limit				
		Energy and other taxes				
Industry		No fossil fuel subsidies				
	Strategy for material efficiency (including product standards and other requirements) (5)	Support for energy efficiency in industrial production (including voluntary approaches, fiscal/financial incentives, obligation schemes or white certificates) (9)	Support schemes for renewables (including fiscal/financial incentives, green certificates, obligation schemes) (4)	CCS support scheme (including fiscal/financial incentives and infrastructure investment) (4)	Landfill methane reduction (5)	
		Energy reporting and audits (2)	Sustainability standards for biomass use (1)		Incentives to reduce CH4 from oil and gas production (3)	
		Minimum energy performance and equipment standards (8)			Incentives to reduce NZO from industrial processes (3)	
					Incentives to reduce fluorinated gases (6)	
		Overarching carbon pricing scheme or emissions limit				
		Energy and other taxes				
Buildings		No fossil fuel subsidies				
	Urban planning strategies (including infrastructure investments) (1)	Building codes and standards and fiscal/financial incentives for low-emissions choices in heating, cooling, hot water, and cooking (2)	Support scheme for heating and cooling			
		Minimum energy performance and equipment standards for appliances (2)	Support scheme for hot water and cooking			
			Sustainability standards for biomass use			
	Energy and other taxes					
	No fossil fuel subsidies					
Transport	Urban planning and infrastructure investment to minimize transport needs (2)	Minimum energy/emissions performance standards or support for energy efficient for light duty vehicles (6)	Biofuel target	Support for modal share switch (3)		
		Minimum energy/emissions performance standards or support for energy efficient for heavy duty vehicles (7)	Support schemes for biofuels (including fiscal/financial incentives and obligation schemes) (9)	E-mobility programme (1)		
			Sustainability standards for biomass use (1)			
		Tax on fuel and/or emissions (1)				
	No fossil fuel subsidies					
Agriculture and forestry	Standards and support for sustainable agricultural practices and use of agricultural products (7)					
	Incentives to reduce CO2 emissions from agriculture					
	Incentives to reduce CH4 emissions from agriculture (1)					
	Incentives to reduce N2O emissions from agriculture					
	Incentives to reduce deforestation or support for afforestation/reforestation (3)					

Assessing progress of countries in achieving NDCs

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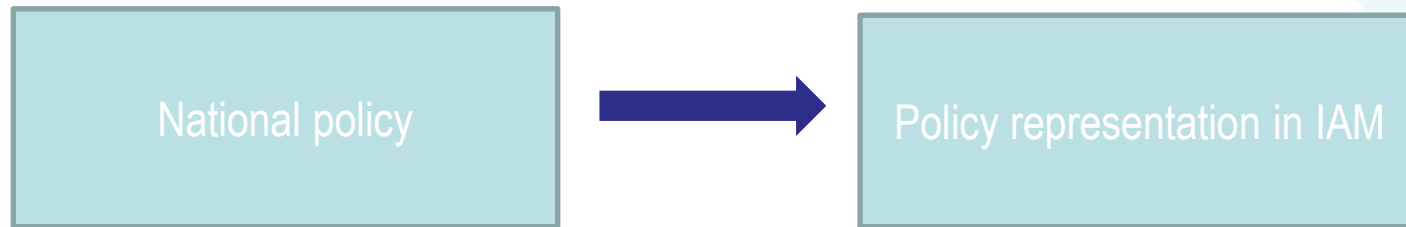


The screenshot shows the homepage of the Climate Policy Database. At the top, there is a navigation bar with links for 'NewClimate Policy Database', 'Search policies', 'Analysis', 'Browse countries', 'This page', 'Tools', and 'User'. A search bar is located on the right. Below the navigation bar, the title 'Climate Policy Database' is displayed. A brief description states: 'The Climate Policy Database collects information on currently implemented policies related to climate change mitigation from countries worldwide. The objective of the portal is to provide an open, collaborative platform for quick information access, policy analysis and good-practice sharing.' A list of links includes 'Good practice menu and coverage by 30 major emitting economies', 'Initial report based on the good practice menu prepared using this database (external link)', 'About', and 'Data structure and categorisation'. A search instruction reads: 'Start your search by clicking a country from the map below, or using the search tabs in the menu.' A world map is shown with several countries highlighted in green. On the right side, there are two summary boxes: 'Number of Policies' with the value '2925' and 'Number of Countries' with the value '113'. Below these are logos for 'NEW CLIMATE INSTITUTE', 'CD-LINKS', 'WAGENINGEN UNIVERSITY', and 'PBL Netherlands Environmental Assessment Agency'. At the bottom, a small text block mentions: 'This database is developed by NewClimate Institute with support from the Dutch Ministry of Infrastructure and Environment. It is also used for the EU-funded CD-LINKS project with contribution from Wageningen University and PBL Netherlands Environmental Assessment Agency.'



- Translation into input for models (protocol also accessible on the web)
- Evaluation of global model results

Implementation of policies in IAMs



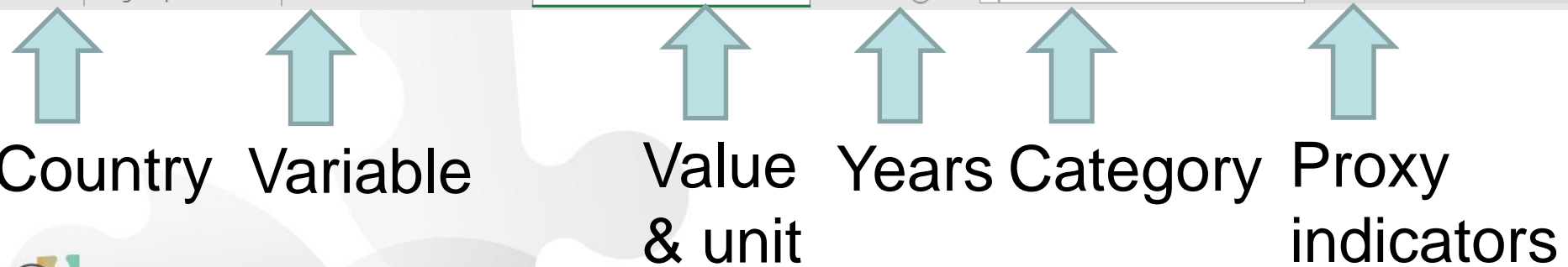
- Translate national policies for models
- How well are sectors represented in IAM?
 - (direct) Distillate targets from policies or
 - (indirect) Define generic impact indicator: renewable share, emission intensity, energy intensity

Protocol – G20 high impact policies

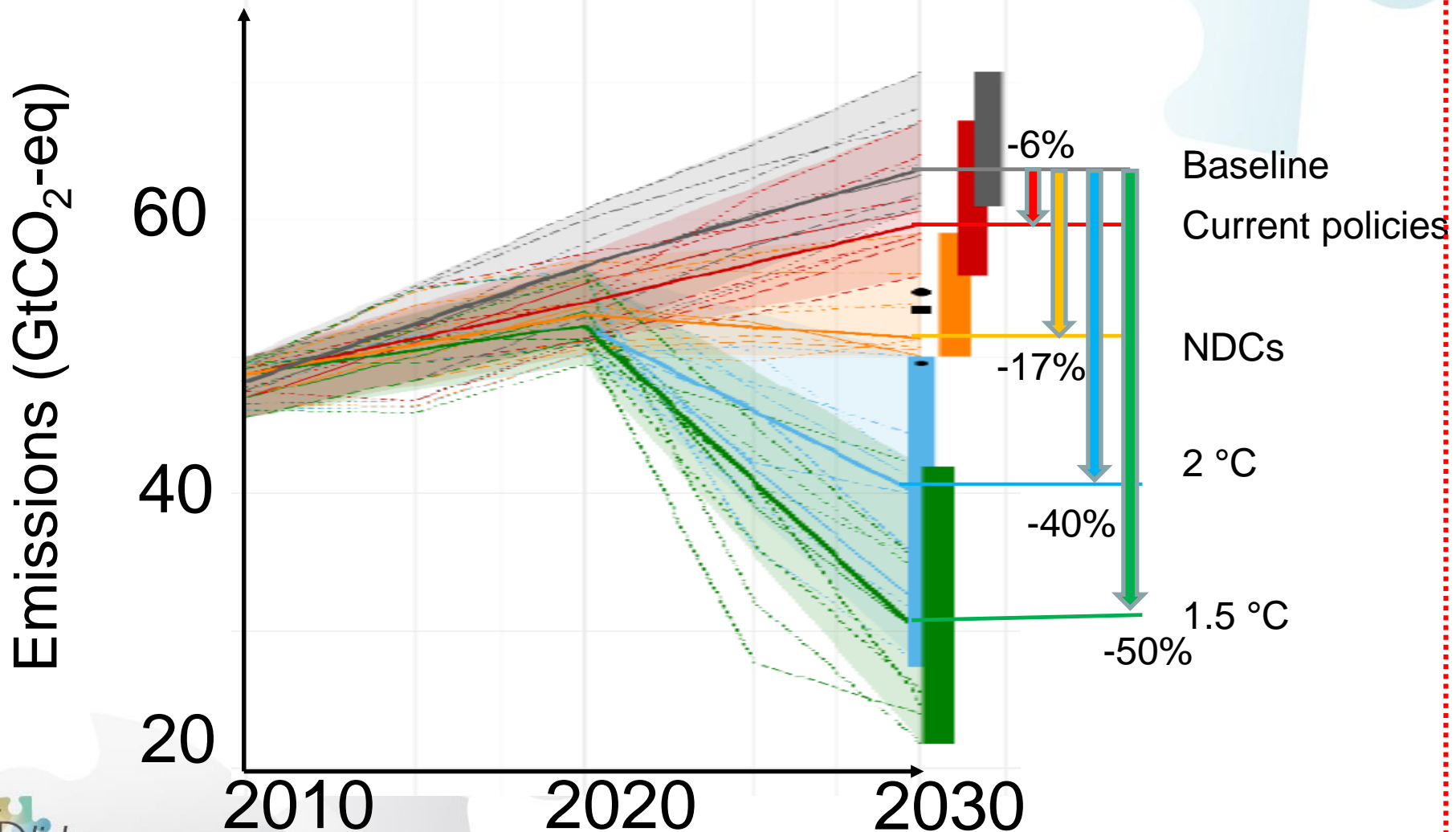
Blue: different interpretation of the same target in the row above (Class: 'Alternate interpretation'). Orange: optional policy instruments (Class: 'Optional'). Green: planned policies for optional NPIP scenario

Proxy indicators from IMAGE (only) [https://cd-links.iiasa.ac.at/WP3/Task%2032%2016](https://cd-links.iiasa.ac.at/WP3/Task%2032%202016)

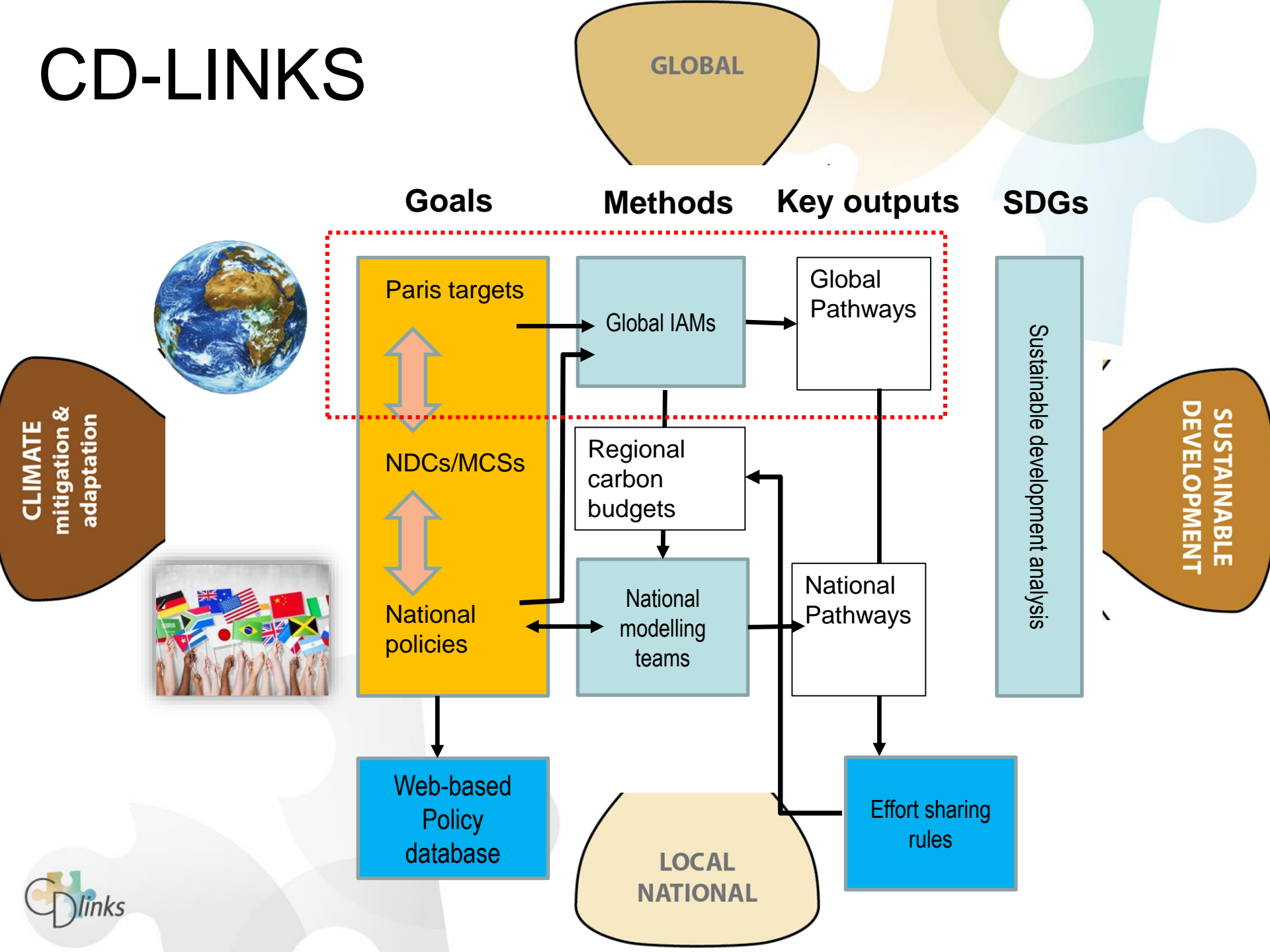
Country	Variable	Value	Unit	Base y	End y	Class	Comments	Proxy need	Implemented	Target ex	NoPolicy	Npi
Brazil	Electricity capacity Solar	0	GW		2025	Target	Updated to MSB (2025) 0	yes	yes	yes	0.02	0.05
Brazil	Electricity capacity Wind	16.5	GW		2025	Target	Updated to MSB (2025) 16	yes	yes	yes	0.09	0.18
Brazil	Access to electricity Population	98	%		2018	Target		yes	yes	over	1.14	1.12
Brazil	Ban of incandescent light bulbs				2014	Optional		yes	yes	yes	1.14	1.12
Brazil	Biofuel share in gasoline Bioethanol	25	%		2015	Target		yes	x	x	0.25	0.47
Brazil	Biofuel share in diesel Biodiesel	7	%		2015	Target		yes	x	x	0.25	0.47
Brazil	Biofuel share in diesel Biodiesel	10	%		2019	Target		yes	x			
Brazil	Biofuel share in transport Bioethanol + biodiesel	24	%		2015	Target		yes	yes	yes	0.25	0.47
Brazil	Fuel efficiency Gasoline + diesel cars New	1.14	MJ/pkm		2017	Target		yes	yes	yes	3.40	2.33
Brazil	Reforestation (area)	1.20E+07	ha		2030	Target		land-use				
Brazil	Emissions LULUCF CO2	-50%	%		2010	2020	Target	land-use				
Brazil	Emissions LULUCF CO2	250	Mt CO2		2020	Alternate interpretation		land-use				
Brazil	Emissions Kyoto Gases AFOLU	-149.5	Mt CO2e	Baseline	2020	Target	ABC plan now marked as c	no				
Brazil	Share of renewables (TPES)	45	%		2030	Planned		no				
Canada	Power plant standard New power plants	420	g CO2/kWh		2015	2030	Target	no				
Canada	Power plant standard New power plants Change in CO2 intensity (kg CO2/kWh)	-64	%		2010	2030	Alternate interpretation	no				
Canada	Emissions Buildings	-6.5	Mt CO2e	Baseline	2020	Target		yes	yes	under		
Canada	Emissions Buildings	-4.5	%	Baseline	2020	Alternate interpretation		yes	yes	under		
Canada	Biofuel share in transport Bioethanol + biodiesel	3.7	%		2011	Target		yes	yes	under	0.04	0.06
Canada	Biofuel share in diesel Biodiesel	2	%		2011	Target		yes	x	x	0.04	0.06
Canada	Biofuel share in gasoline Bioethanol	5	%		2011	Target		yes	x	x	0.04	0.06
Canada	Fuel efficiency Light-duty vehicles (passenger vehicles) New	0.91	MJ/pkm		2025	Target		yes	yes	yes	1.67	1.18



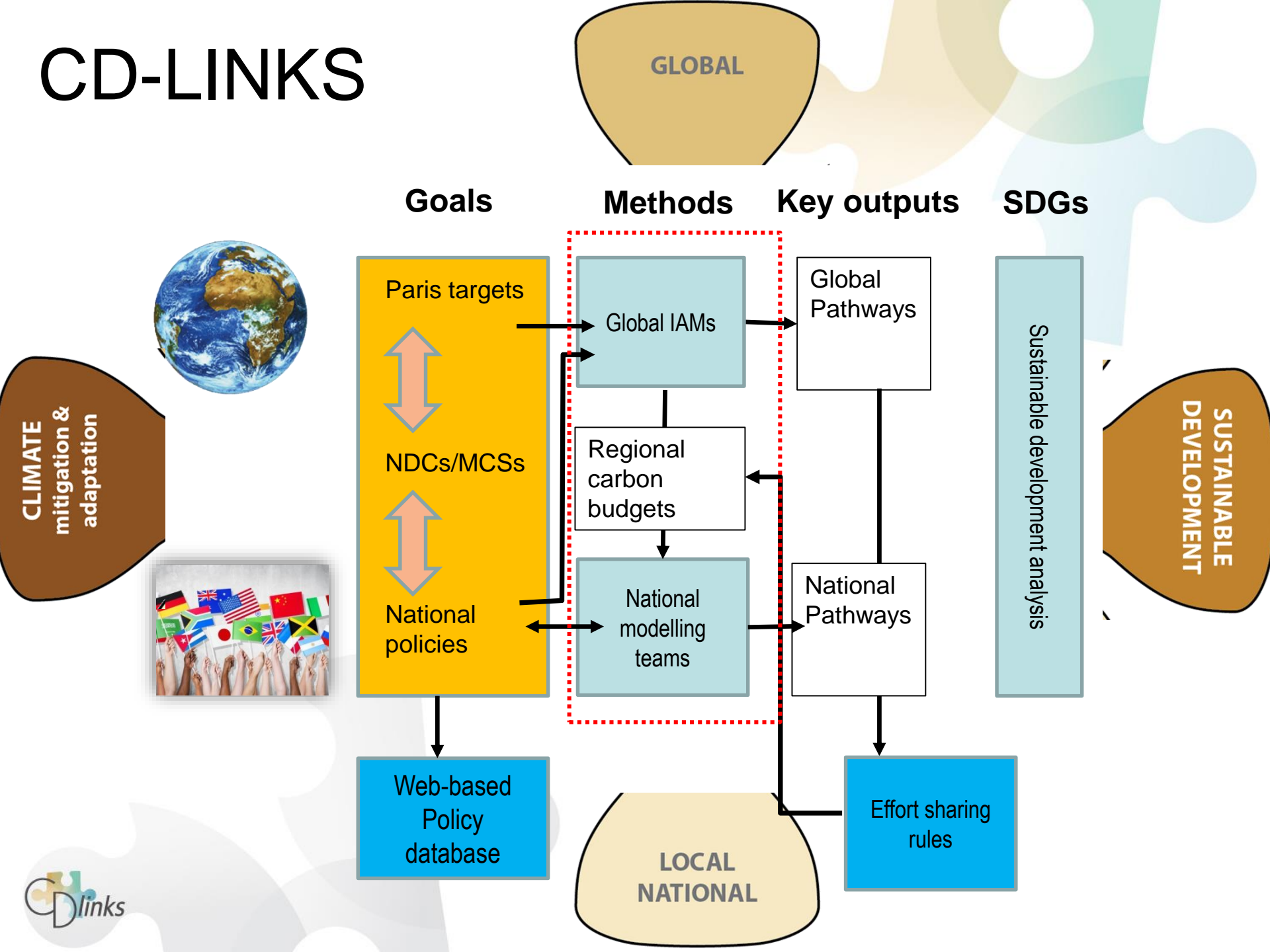
First multi-model assessment of detailed climate policies



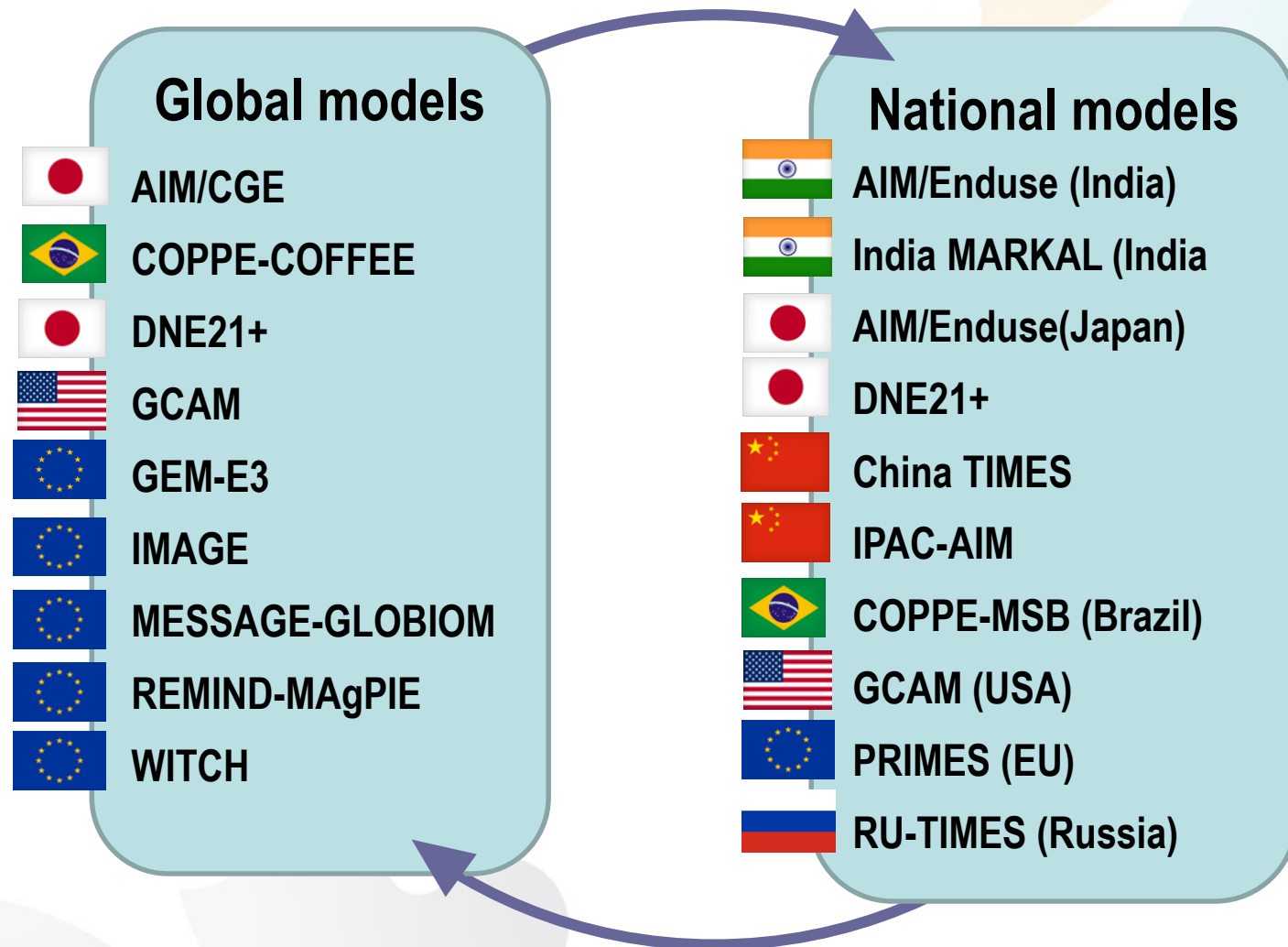
CD-LINKS



CD-LINKS

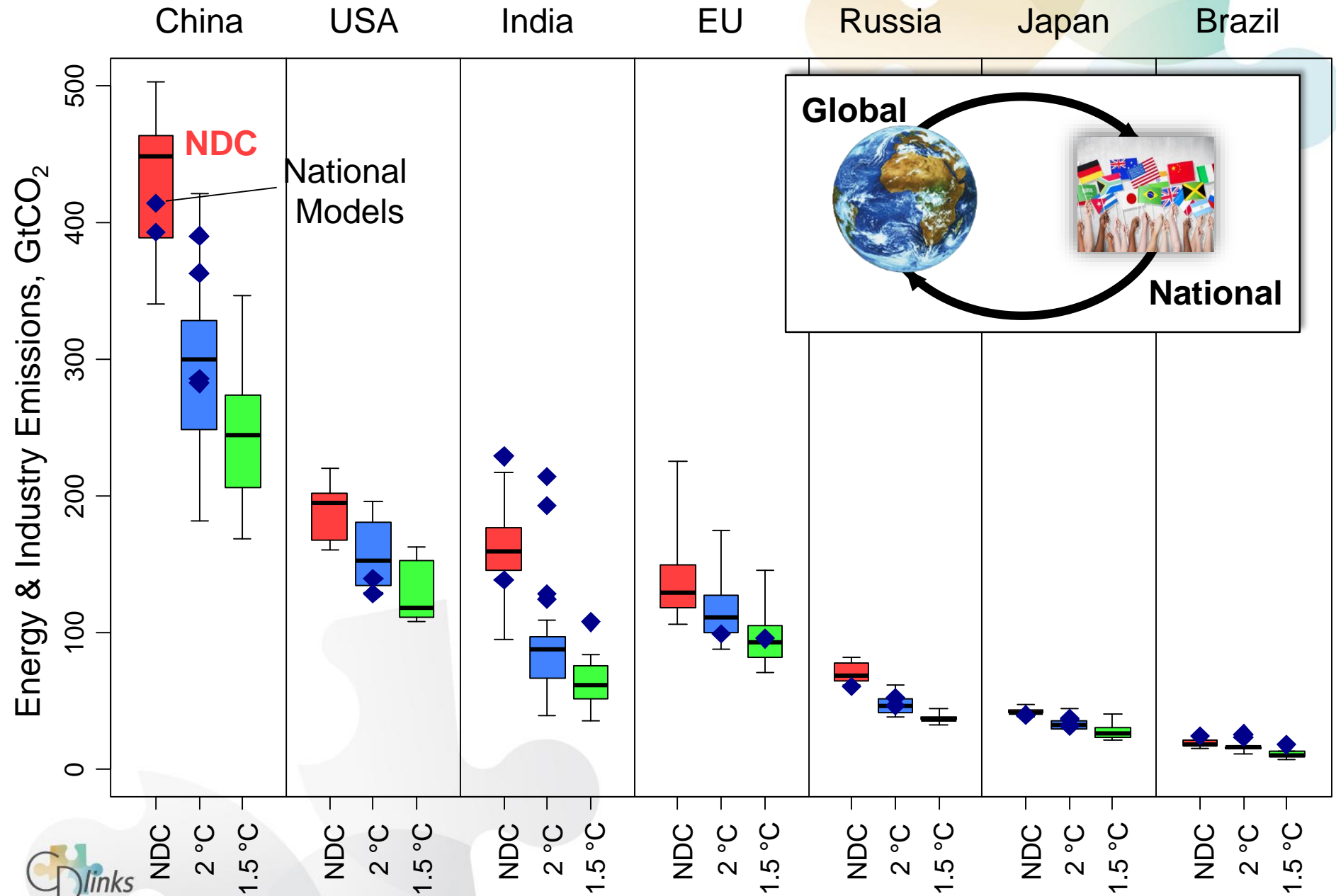


National and global models

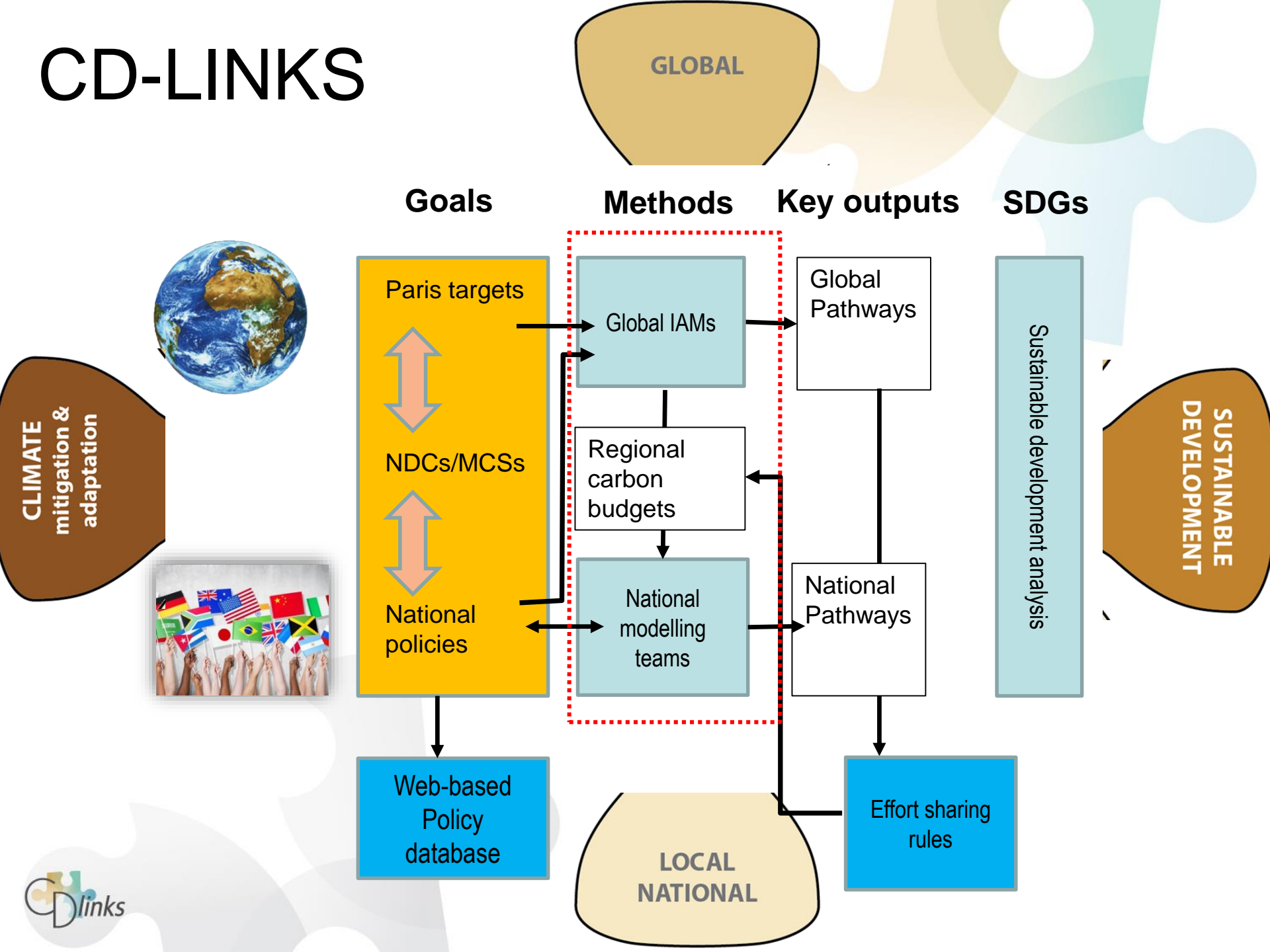


Top 7 emitters (~ 66% of global GHG emissions).

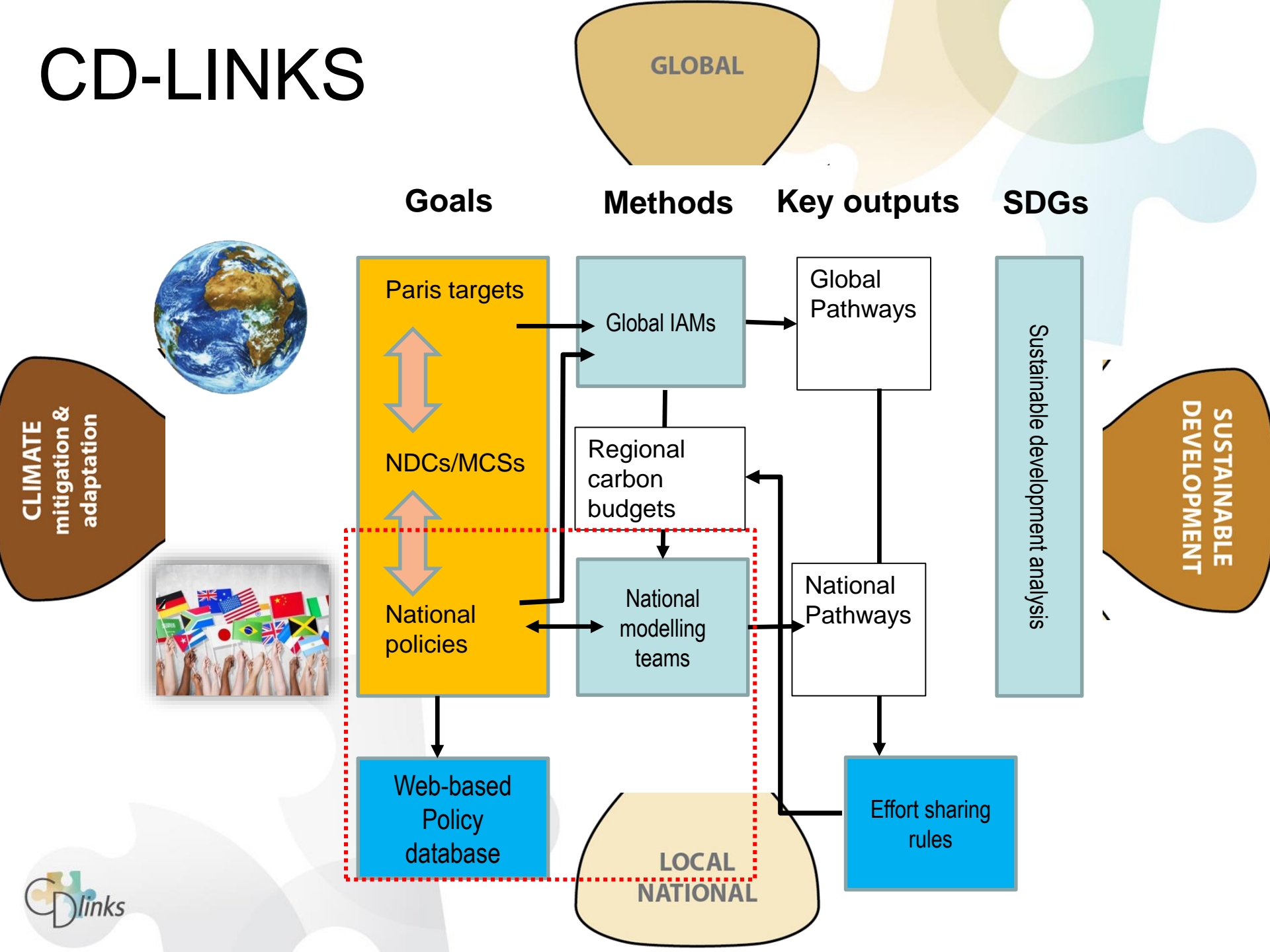
Cumulative emissions 2010-2050, by region



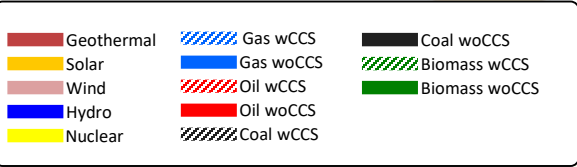
CD-LINKS



CD-LINKS



Primary Energy Reserves from National Teams

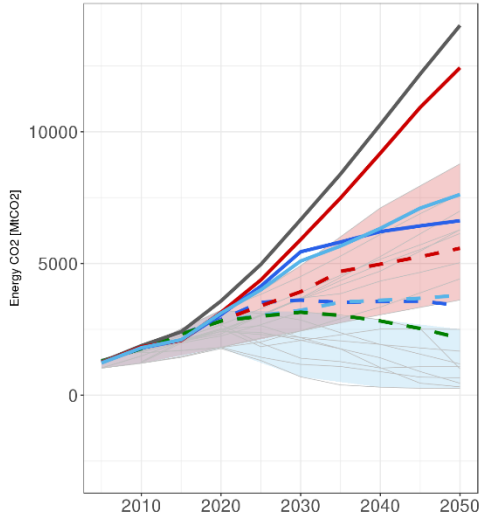
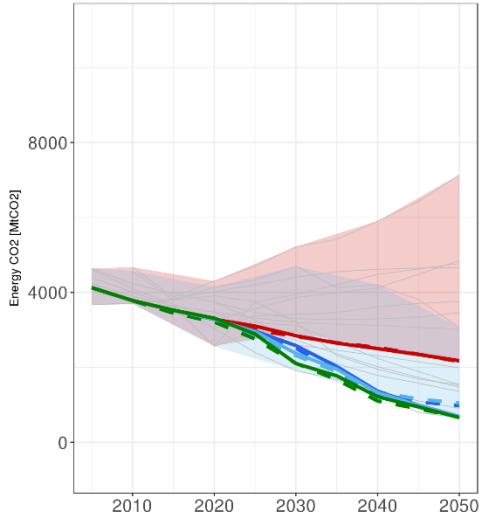
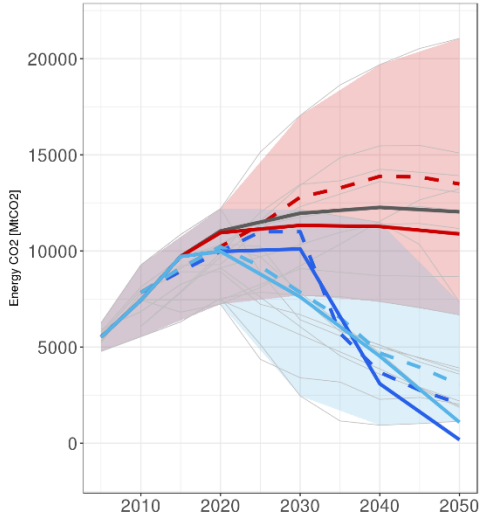
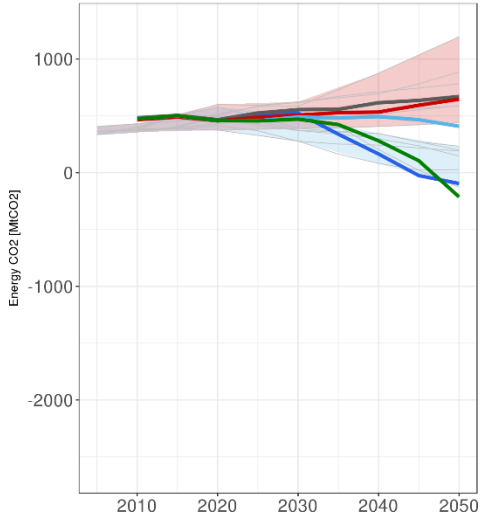


Brazil (MSB)

China (IPAC: -, CHN-TIMES: --)

EU (PRIMES: -, GEM-E3: --)

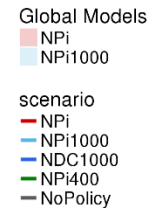
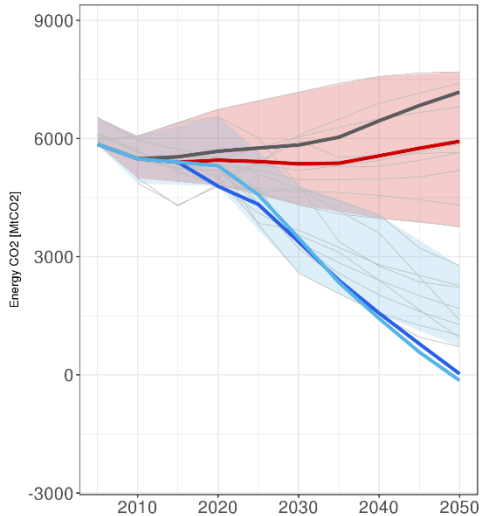
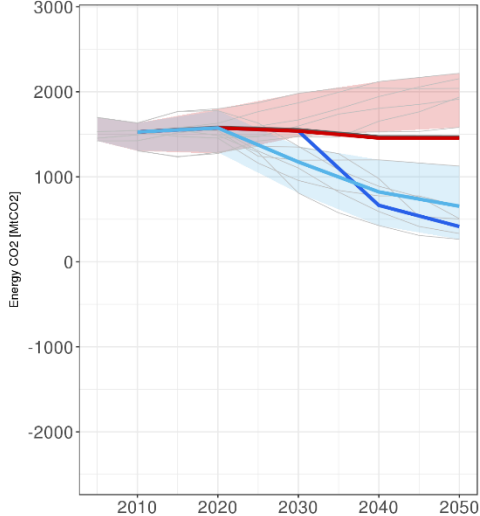
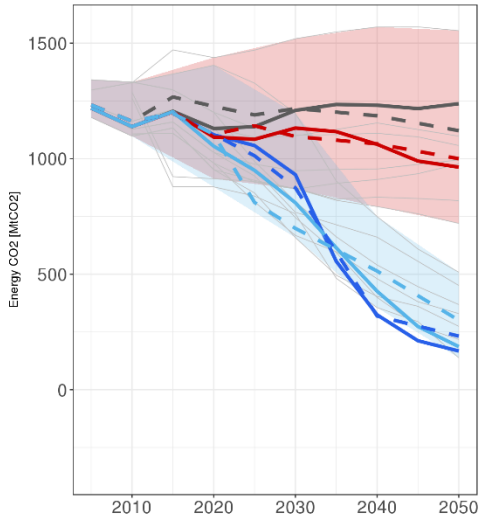
India (IND-MARKAL: -, AIM/E-IIM: --)



Japan (AIM/E-NIES: -, DNE21+: --)

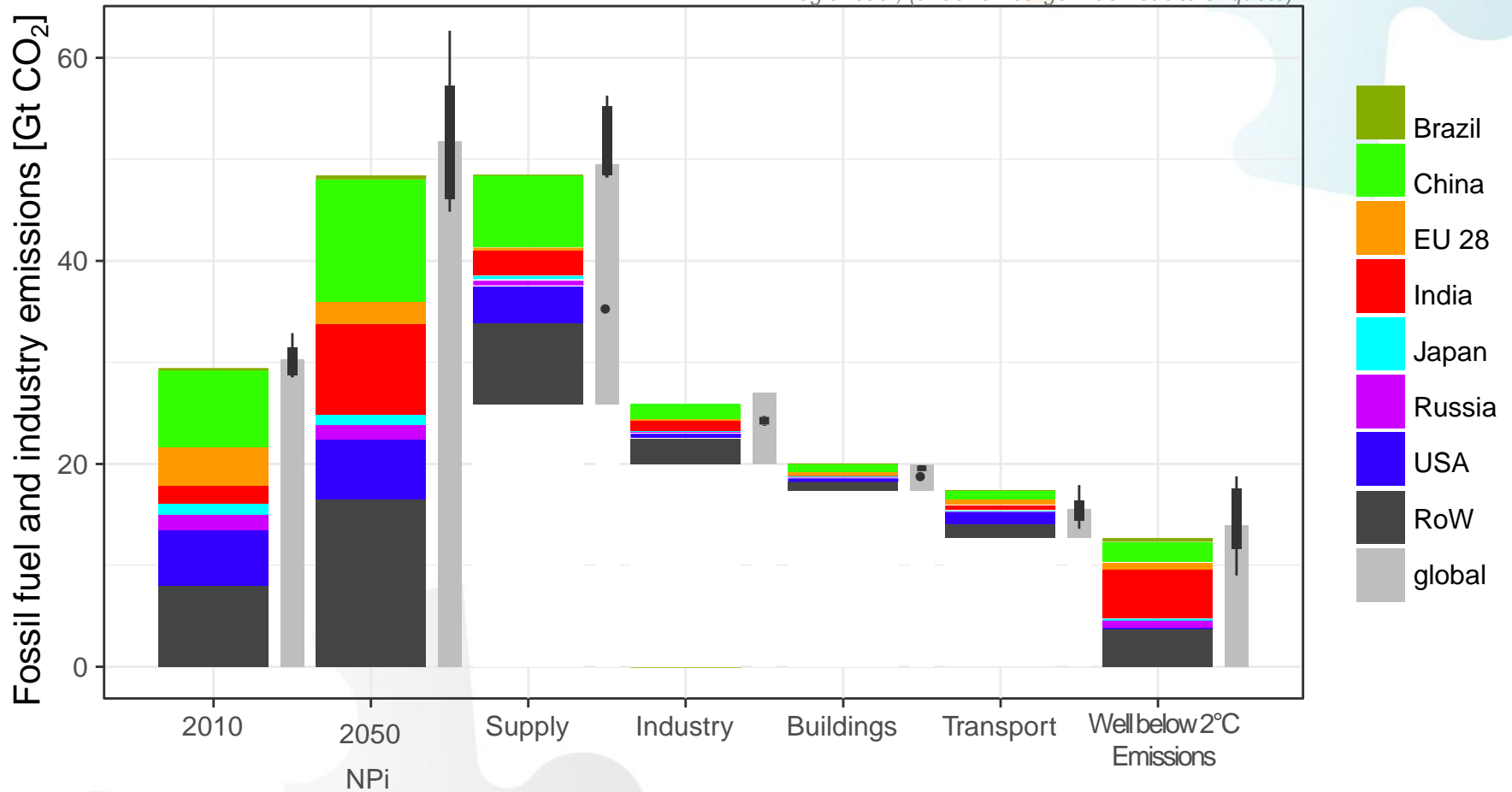
Russia (RU-TIMES)

USA (GCAM_USA)



Stringent decarbonization scenarios: Collective CO₂ emissions outcome in 2050

Kriegler et al, (under embargo – do not cite or quote)





See also: report update - Assessing progress of countries in achieving NDCs

- Study by NewClimate Institute, PBL Netherlands Environmental Assessment Agency and IIASA, ongoing since 2012
- Updated fact sheets for 25 major emitting countries
 - 2020 pledge and 2030 NDC/INDC information
 - Overview of current energy and climate policies
 - Updated current policy emission projections
- Largely based on CD-LINKS policy overview and quantification
- Forms an integral part of the UNEP Emissions Gap Report

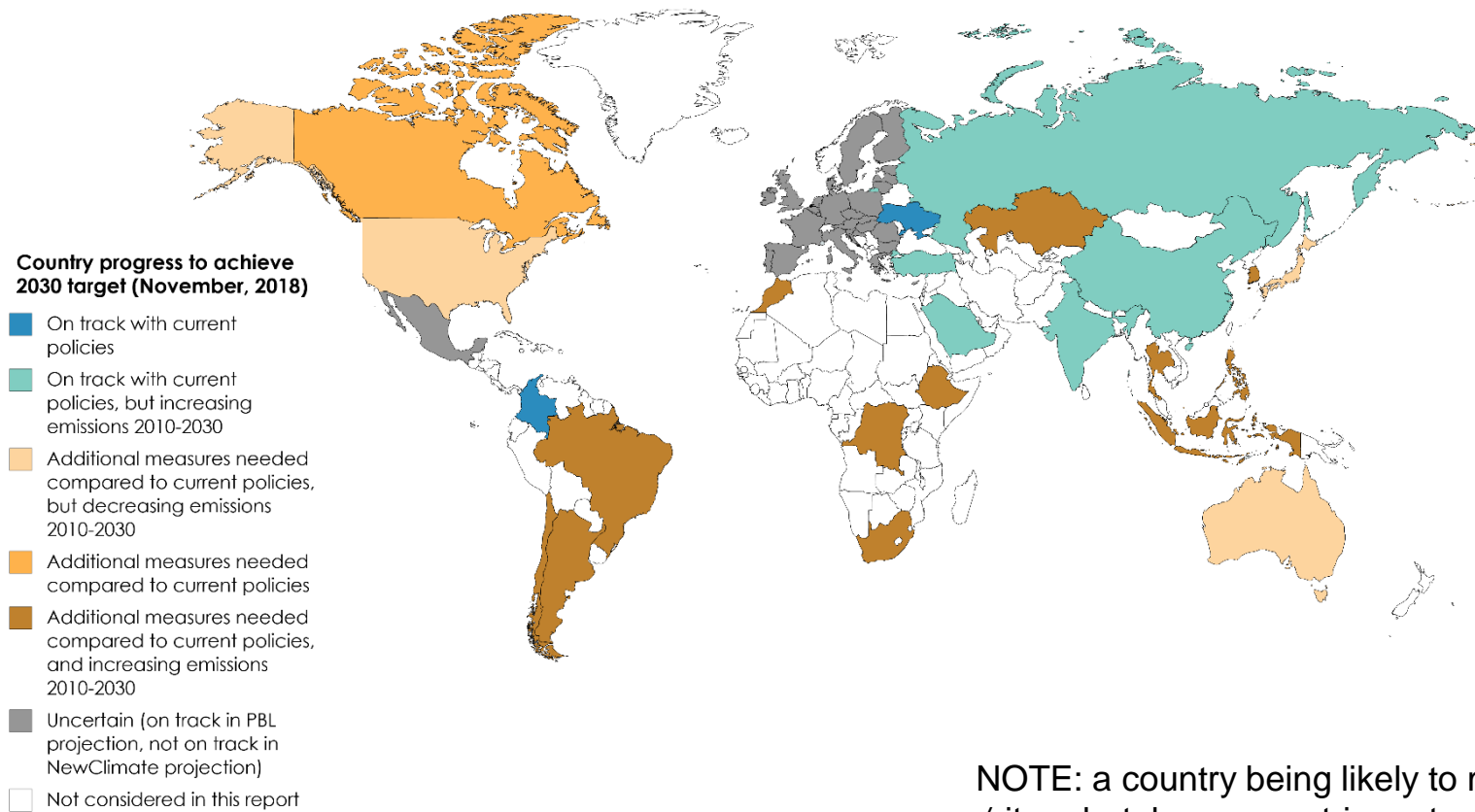


This report has been prepared by PBL/NewClimate Institute/IIASA under contract to European Commission, DG CLIMA (EC service contract N°340201/2017/764007/SER/CLIMA.C1) started in November 2017

<https://newclimate.org/2018/12/05/greenhouse-gas-mitigation-scenarios-for-major-emitting-countries-analysis-of-current-climate-policies-and-mitigation-commitments-2018-update/> 23



Two-thirds of countries still not on track

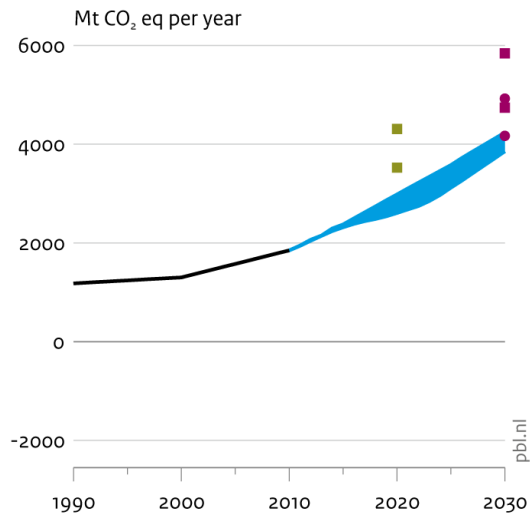


NOTE: a country being likely to meet its targets ≠ it undertakes more stringent action than a country that is not on track

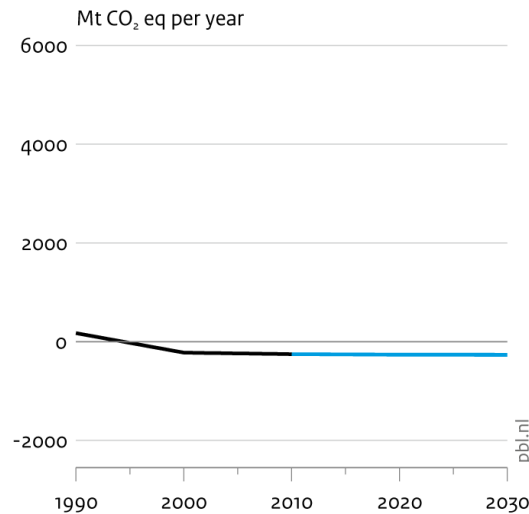
India: on track to achieve NDC with current policies

Impact of climate policies on greenhouse gas emissions in India

Including GHG emissions from land use



GHG emissions from land use



- History
- 2020 pledge
- NDC
- Unconditional
- Unconditional: intensity target
- Conditional: intensity target, non-fossil target, afforestation target

- Clean energy cess
- National solar and wind missions & other RE
- 12th Five Year Plan
- National electricity plan
- Car fuel economy standards
- Electric vehicles target
- National policy biofuels
- PAT (industry)
- Green India Mission

Source: PBL FAIR/TIMER model; NewClimate Institute calculations; IIASA GLOBIOM/G4M model

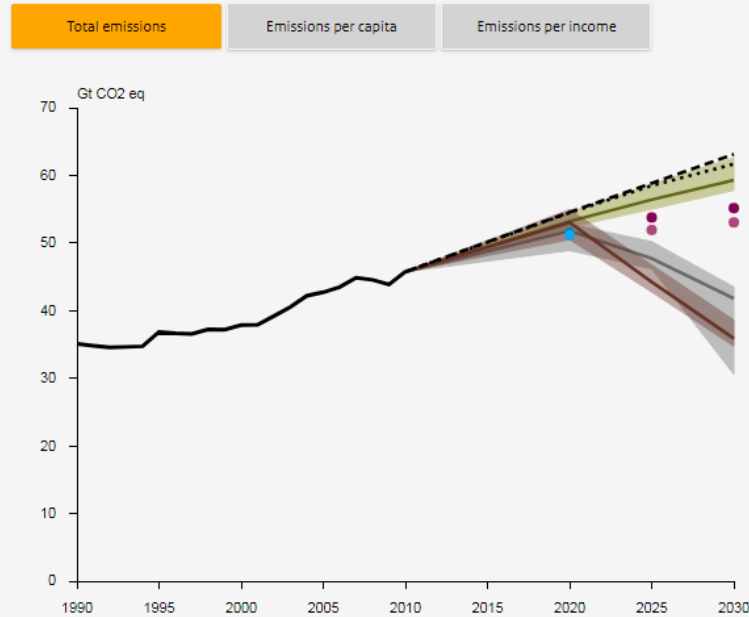


See further: PBL Climate Pledge NDC tool

Results: NDC emission targets and the impact of policies

Global

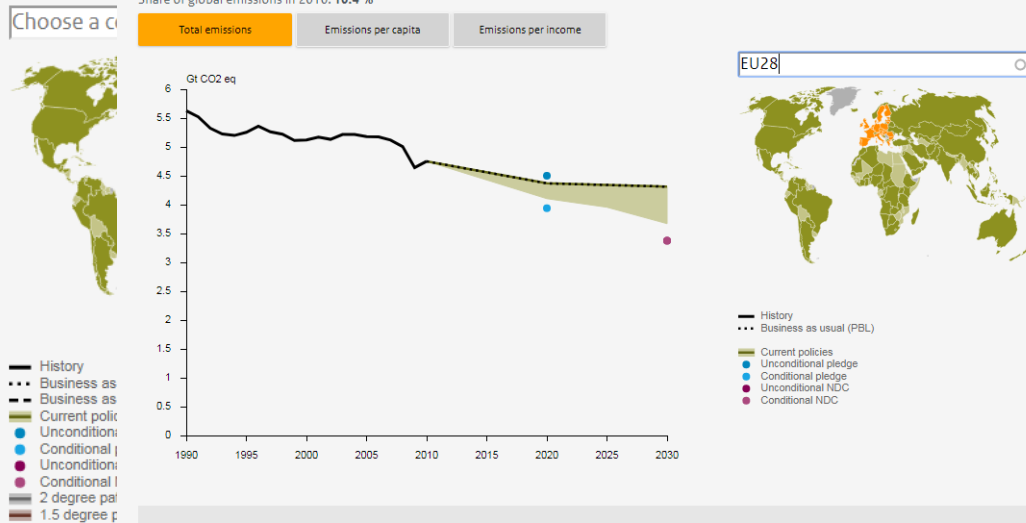
Share of global emissions in 2010: 100%



Source: PBL, 2017

EU28

Share of global emissions in 2010: 10.4%



EU28

Reduction target for the second commitment period (2013-2020) under the Kyoto Protocol

- Reduction target for greenhouse gas emissions of 20% below 1990 levels, averaged over the 2013-2020 period

Unconditional pledge(s)

- Greenhouse gas emission target for 2020 of 20% below 1990 levels
- The EU is enforcing its national legally binding framework to deliver its unconditional 20% pledge

Conditional pledge(s)

- Greenhouse gas emission target for 2020 of 30% below 1990 levels

Unconditional NDC(s)

- Greenhouse gas emission target for 2030 of 40% below 1990 levels

Mitigation measure(s) with highest impact

Sector	Policies	Description
Economy/state wide	EU ETS Directive (2003/87/EC revised by Directive 2009/29/EC)	Emission cap on emissions from electricity/heat and industry of 21% below 2005 levels, by 2020
Energy supply	Renewable Energy Roadmap/ Directive (2009/28/EC)	Target of 20% renewable energy by 2020

<https://themasites.pbl.nl/climate-ndc-policies-tool/>



New visualisation tool - The global stocktake: keeping track of implementing the Paris Agreement

EMISSIONS

BUDGET

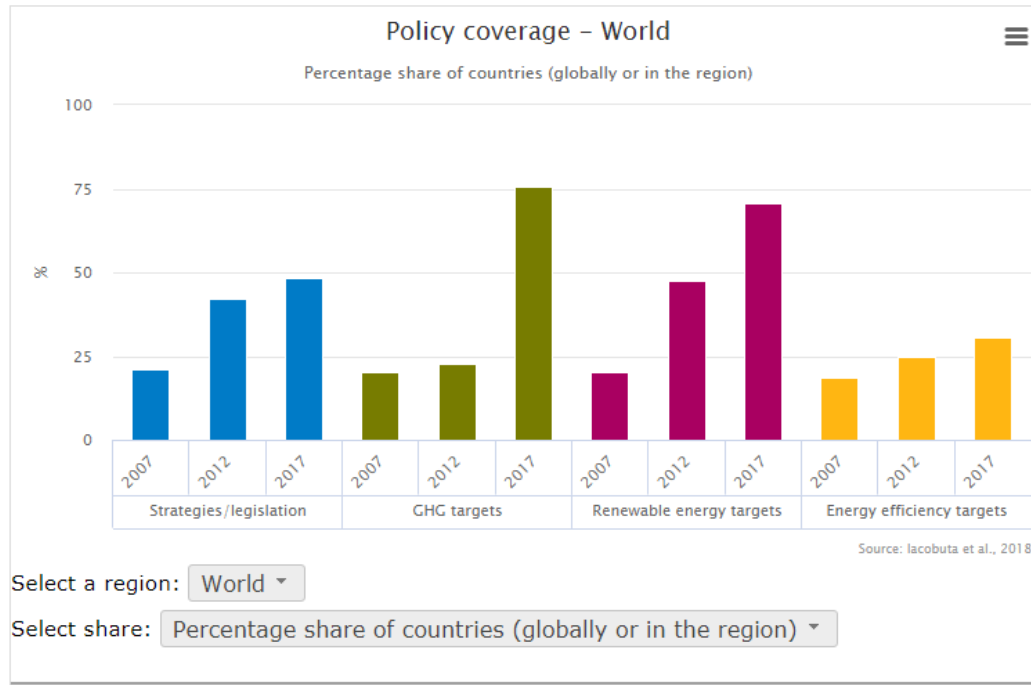
DECARBONISATION

POLICY

INOVATION

INVESTMENT

SCENARIOS



Policy brief for Talanoa Dialogue:
<https://unfccc.int/documents/184187>

Updated version via:
<https://themasites.pbl.nl/commit/>



Opportunities for Enhanced Action to
Keep Paris Goals within Reach

Contribution to the Talanoa Dialogue by the COMMIT and CD-LINKS projects
November, 2018



Thank you!

<http://www.cd-links.org/>

Follow us on Twitter: [@C_DLINKS](https://twitter.com/C_DLINKS)



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