

Developing policy-relevant narratives underlying long-term climate strategies - Methodology based on the Deep Decarbonisation Pathway Project (DDPP)

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Introduction

To achieve the long-term objectives of the Paris Agreement, Art 4.19 calls upon parties to develop long-term low-greenhouse gas emission development strategies. The European Union (EU) as a party to the Agreement, recently introduced new legislation, “Regulation for the Governance of the Energy Union”,¹ to comply with the provisions of the Paris Agreement through mandating Member States to develop long-term climate strategies. These strategies need to be underpinned by narratives in order to consistently inform medium- and short-term policy including stakeholder groups on the decarbonisation pathway. Therefore, narratives need to ingrain socio-economic development objectives that respond to the national circumstances and priorities. However, to date there is little guidance on how to approach the development of narratives capable of responding to policymakers and stakeholder’s concerns. Furthermore, there is no cross-countries applicable design framework that translates Paris-compatible objectives into effective national strategies and narratives. The Deep Decarbonisation Pathways Project (DDPP) aims to fill that gap through enabling a profound understanding of what is needed for deep decarbonisation sector by sector and over time in line with (well-) below 2°C emission. This brief describes the DDPP pathway design framework focusing on the development of narratives to inform policy and stakeholders while incorporating national socio-economic development goals.

The DDPP is a global collaborative research initiative led by the Institute for Sustainable Development and International Relations (IDDRI) in partnership with the Sustainable Development Solutions Network (SDSN). Its aim was to support countries in developing national long-term strategies in line with national circumstances to inform policy formulation and implementation. Therefore, independently working research teams from leading national research institutions conducted national studies coordinated by a joint secretariat of IDDRI and SDSN. Countries taking part included nearly all G20 countries representing about 74 % energy-related CO₂ emissions globally.² Due to the success of the DDPP, a second phase of the DDPP is currently underway extending not only on the geographical scope but also the sectoral depths.³

¹ See Council of the European Union (2018).

² Countries included in the DDPP are Australia, Brazil, Canada, China, France, Germany, India, Indonesia, Italy, Japan Mexico, Russia, South Africa, South Korea, United Kingdom and United States. Share refers to 2014 energy-related CO₂ emissions.

³ See DDPP (2018).

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Development of policy-relevant narratives⁴

Based on the DDPP pathways design framework, the development of policy-relevant narratives follows a 3-step approach. First, key variables or indicators representing the national socio-economic development objectives are identified; these indicators form the draft qualitative storyline (figure 1, step 1). After quantifying the draft storylines into narrative scenarios (figure 1, step 2), the results from the quantification process are compiled in a common reporting template. The template summarizes the indicators including all emissions and abatement drivers sector by sector broken down to milestones over time. The purpose is to have a transparent and user-friendly illustration of each indicator defined before in order to inform effective policy design (figure 1, step 3). This process is described in more detail in the following.

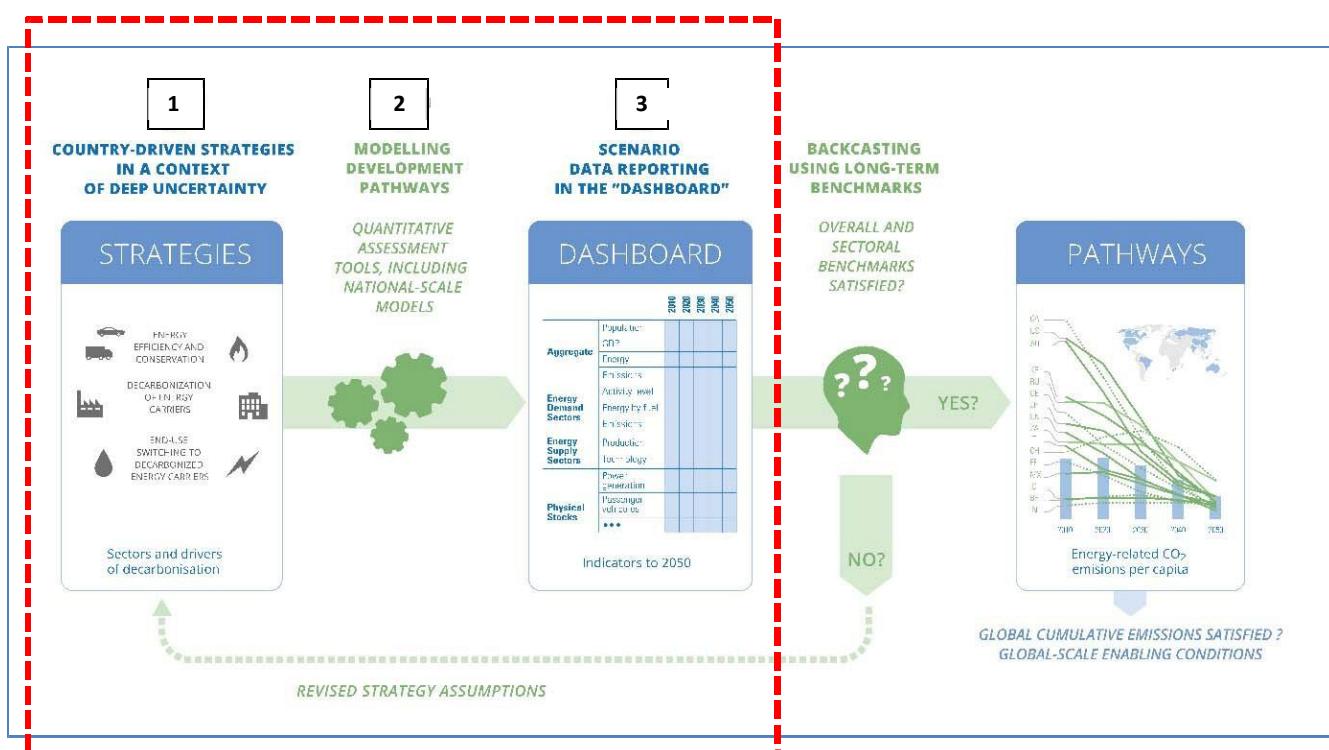


Figure 1: The DDPP pathway design framework with the red frame indicating the focus on narrative development. Source: Waisman (2018).

1. Identification of socio-economic low-emissions development storyline

The aim of this step is to draft a qualitative socio-economic low-emission development storyline or narrative to inform policymakers and peers on the policy relevance of individual pathways. Therefore, national non-climate objectives and priorities at the aggregate level referring to cross-sectoral policy objectives and at a more granular level referring to sectoral and sub-sectoral pathways need to be identified. Aggregate objectives could include

⁴ The following step-wise approach is based on yet unpublished material by Henri Waisman (IDDR) referring to a Memo on the DDPPLAC reporting template, a study featuring the DDPP pathway design framework.

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economic growth, income inequality and access to services, on the disaggregate level sectoral strategies could refer to transport including the role of the shipping industry or railroad industry. Likewise, limitations, that may constrain the achievement of national goals, have to be identified. Examples could range from water and biomass availability to population and urbanization trends. The identified indicators serve as the frame for developing decarbonisation strategies incorporating national sensitivities.

Within the national objectives defined, the DDPP framework defines the following “pillars of decarbonisation”, to describe the decarbonisation process.

- Energy conversion and energy efficiency
- Decarbonisation of energy carriers
- Switching of energy carriers⁵.

The resulting storyline qualitatively describes how the country develops and decarbonizes. It starts with a description of the evolution of pre-defined socio-economic development indicators under the pillars of decarbonisation and then describes the decarbonisation process over time. A storyline for the transport sector could be: “In the transport sector, improvement in frequency and reliability of electricity-powered intercity bus lines allows a lower growth in personal vehicles. Another example could be “in residential housing the renovation of the entire building stock complemented by the reduction of energy demand thanks to smart consumption technologies will significantly reduce household heating costs”.

Importantly, stakeholders including policymakers are key to define national relevant indicators and therefore consultations and discussions need to be conducted from the very beginning and ideally expanding the entire narrative development process including iteration for adjustments. What's more, discussions with stakeholders of national objectives and priorities not only support the development of the national storylines but also help to create understanding and buy-in into the national decarbonisation strategy.

2. Translation of narrative strategies into quantified scenarios

To develop quantified scenarios, national models play a key role. Models can translate narratives into quantified scenarios by assessing the country-relevant indicators such as physical sectoral emission intensities or socio-economic metrics. The assessment needs to be as transparent as possible in order to inform and (re-)discuss with different stakeholder groups (including policy makers) for example in case the national decarbonisation pathway needs to be adjusted when accounting for 1.5 °C-compatible trajectories.

⁵ Further pillars such as land use management and material efficiency are used in subsequent DDPP research initiatives.

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Despite the legitimacy models provide for example with regard to sectoral coverage and feasibility of input variables, models may reach their limits when assessing the ex-ante identified indicators. Examples include real world constraints such as the inclusion of compensation schemes of stranded assets or taking into account implications of just transitions from a coal phase-out (re-training or early retirement programs). In that case, complementary information is required to provide the quantitative estimates. These can come from a variety of sources such as mining of studies, reaching out to think tanks, research institutions or other available expertise including business associations or individual experts.

3. Scenario data reporting in the “dashboard” (common reporting template)

Model outputs and information from alternative sources as described above may vary greatly depending on the focus and level of granularity of the information, which can lead to stakeholder confusion and constrain policy design. For an effective communication of narrative scenarios to policy makers and peers, a common reporting template (dashboard) was developed as part of the DDPP.⁶ Results from the quantification process of the narrative scenarios need to be separately reported into the common reporting templates.

The reporting template lists several variables (including their units) for different years (2020, 2030, 2040 and 2050). These include the countries' emission and abatement drivers and discloses information on the country's main determinants of decarbonisation characterizing the sectoral and sub-sectoral transformation at a sufficient level of granularity and technical transparency (cp. figure 2). For example, for the sector of passenger transport, categories include cars, motorcycles, buses and rail broken down into activity level, fuel shares and CO₂ per entity and hence reveal information on the number of electric vehicles and charging stations needed to achieve the national decarbonisation objectives. Accounting for each economic sector at a sufficient level of detail, thus sheds light on the conditions and requirements needed for the national transformation including levels of investment needed, potential for economies of scale and learning rates as well as behavioral change.

Finally, the dashboard is designed to allow for a comparison of different national decarbonisation strategies, for cross-country comparisons and benchmarking. The high level of transparency on emissions and abatement drivers may not only inform national discussions but in addition, when aggregated at the global level, could serve as a key input into the recurring global stocktake of the Paris Agreement.⁷

⁶ The dashboard is open-source and accessible via the DDPP website (see references).

⁷ To achieve transnational comparisons in order to inform various discussions at international level, countries would need to consent sharing national dashboards.

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A	B	C	D	E	F	G	H	I
1	Dashboard							
2	Color Key:							
3	Inputs							
4	Indicators							
5								
6								
7								
8								
9	Aggregate Inputs and Indicators							
10	Aggregate Inputs							
11	Population	Millions	0	0	0			
12	Number of Households	Millions	#DIV/0!	#DIV/0!	#DIV/0!			
13	GDP (real US\$)	B\$	\$1	\$1	\$1			
14	Final energy consumption (FEC)	EJ	0	0	0			
15	Total primary energy supply	EJ	#DIV/0!	0	0			
16	Fuel combustion CO2 emissions	MtCO2	#DIV/0!	#DIV/0!	#DIV/0!			
17	Fuel combustion, fugitive, and industrial process CO2 emissions	MtCO2	#DIV/0!	#DIV/0!	#DIV/0!			
18	total GHG emissions (all s'ources)	MtCO2e	#DIV/0!	#DIV/0!	#DIV/0!			
19	Aggregate Indicators							
20	Energy intensity of GDP	TJ/M\$	0,0	0,0	0,0			
21	CO2 intensity of FEC	tCO2/TJ	#DIV/0!	#DIV/0!	#DIV/0!			
22	Energy transformation efficiency	%	#DIV/0!	#DIV/0!	#DIV/0!			
23	Per Capita Aggregate Indicators							
24	Per capita GDP	GDP/cap	#DIV/0!	#DIV/0!	#DIV/0!			
25	Per capita FEC	TJ/cap	#DIV/0!	#DIV/0!	#DIV/0!			
26	Per capita fuel combustion CO2 emissions	tCO2/cap	#DIV/0!	#DIV/0!	#DIV/0!			
27	Per capita fuel combustion, fugitive, and industrial process CO2 emissions	tCO2/cap	#DIV/0!	#DIV/0!	#DIV/0!			
28	Per capita total GHG emissions (all sources)	tCO2/cap	#DIV/0!	#DIV/0!	#DIV/0!			
29								
30	Aggregate Electricity Inputs							
31	Electricity generation	TWh	#DIV/0!	0	0			
32	Electricity consumption	TWh	#DIV/0!	0	0			
33	Electricity CO2 emissions	MtCO2	#DIV/0!	#DIV/0!	#DIV/0!			
34	Aggregate Electricity Indicators							
35	Electricity consumption % FEC	%	#DIV/0!	#DIV/0!	#DIV/0!			
36	Average net CO2 emission factor	kgCO2/kWh generated	#DIV/0!	#DIV/0!	#DIV/0!			

Figure 2 : Excerpt of a DDPP-dashboard - Source: DDPP

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References:

Council of the European Union (2018): Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the Governance of the Energy Union, amending Directive 94/22/EC, Directive 98/70/EC, Directive 2009/31/EC, Regulation (EC) No 663/2009, Regulation (EC) No 715/2009, Directive 2009/73/EC, Council Directive 2009/119/EC, Directive 2010/31/EU, Directive 2012/27/EU, Directive 2013/30/EU and Council Directive (EU) 2015/652 and repealing Regulation (EU) No 525/2013 – Analysis of the final compromise text with a view to agreement. Retrieved from : <http://data.consilium.europa.eu/doc/document/ST-10307-2018-ADD-2/en/pdf>.

DDPP (2018). DDPP website. Retrieved from: <http://deepdecarbonization.org/research-methods/ddpp-collective-toolkit/>.

Waisman, H. (2018): A design framework for national development strategies consistent with the Paris Agreement. IDDRI (submitted).

Waisman, H. (May 25, 2018): Memo on the DDPPLAC reporting template. IDDRI (to be published).

Further information on the DDPP:

Homepage: <http://deepdecarbonization.org/>.

Expansion of the DDPP to Latin American countries (currently underway). Retrieved from: <https://www.iddri.org/en/project/deep-decarbonization-pathways-latin-america>.

DDPP collective toolkit containing the dashboard (open-source) and a user guide. Retrieved from <http://deepdecarbonization.org/research-methods/ddpp-collective-toolkit/>.

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