



Deep Decarbonization Pathways Project (DDPP) Concept Note

The Deep Decarbonization Pathways Project (DDPP):

- Is an initiative initiated by the Sustainable Development Solutions Network (SDSN) and the Institute for Sustainable Development and International Relations (IDDRI).
- Research and analysis is conducted by 13 country teams comprised of 30 national research institutions (annex) from: Australia, Brazil, Canada, China, European Union¹, India, Indonesia, Japan, Mexico, Russia, South Africa, South Korea, and the United States. Collectively the 13 countries represented in the DDPP account for over 75% of global greenhouse gas emissions.
- In addition the project partners with other international organizations, research institutions, and business associations, that provide critical expertise and support to the initiative. At present the list of DDPP partners includes: the International Energy Agency (IEA), the International Institute for Applied Systems and Analysis (IIASA), the Potsdam Institute for Climate Impact Research (PIK), the Economie du Développement Durable et de l’Energie (EDDEN) lab, the German Development Institute (GDI) and the World Business Council on Sustainable Development (WBCSD).

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¹ With a focus on France, Germany and the United Kingdom

Objectives

The objectives of the DDPP are to:

- **Prepare practical national deep decarbonization pathways to 2050, consistent with the 2°C target**, for each of the 13 countries, to help them identify their own cost-effective transition path to a low carbon future.
- **Contribute to a positive result of the September 23rd World Leaders Climate Summit in New York, and to a successful conclusion of the United Nations Framework Convention on Climate Change (UNFCCC) negotiations during the 21st Conference of the Parties (COP) in Paris in December 2015**, by making governments, businesses, and civil society understand how deep decarbonization can practically be achieved in each country.
- **Provide analytical platforms in each participating country to conduct additional climate policy analyses**. Such work may focus on technology diffusion and innovation, policy frameworks, financing, governance arrangements for implementation, etc.
- **Build an on-going global network of experts and practitioners**, by using the pathways prepared as the basis for further work on the implementation of national deep decarbonization strategies, and by applying the methodological tools developed to other countries and regions.

Context and need for national deep decarbonization pathways

The recently released Fifth Assessment Report (AR5) from the IPCC underscores the dangers of a BAU scenario under which average global temperatures may rise by 4°C or more, compared with the Earth's temperature in the pre-industrial age. Most scientists concur that the world should do everything within its reach to keep the world's average temperature from rising by more than 2°C, to avoid unmanageable consequences from climate change. The IPCC AR5 spells out that the world can only emit another 269GtC – the equivalent of 987GtCO₂ – if we are to retain a 66% chance of staying within these 2°C. This carbon budget only increases to 309GtC or 1134GtCO₂ if we accept to lower this likelihood to a mere 50%.

Governments have resolved to stay within 2°C. Yet, their voluntary pledges – even if fully implemented – fall short of what is needed. According to the UNEP Emission Gap Report, existing commitments to reduce emissions are 8 to 13 GtCO₂e below the minimum needed in 2020 to retain a 66% chance of staying within 2°C. Drastic and urgent action is required if the world is to avoid catastrophic climate change.

Our energy systems, industry, housing, transport, land use, and other sectors must undergo profound changes through to 2050 if global per capita emissions are fall to less than 2tCO₂e, as required by the 2°C global carbon budget. Meeting the challenges of deep decarbonization requires unprecedented problem solving on all fronts: technological diffusion and innovation, infrastructure building and replacement, financing mechanisms and financial regulation, policy frameworks, institutional arrangements, business models, consumer behavior, etc. This problem solving in turn requires the development of practical national deep decarbonization pathways through to 2050.

Yet, very few countries or regions – except some European Union member states, California and a few others – have prepared such deep decarbonization pathways. And when they have, they often lack the degree of detail that is necessary to plan for investments and policies. Deep decarbonization pathways may not be sufficient, but they certainly are necessary, and the basis upon which to organize further work on the actual implementation of deep decarbonization strategies.

Defining features and added value

The DDPP is building on extensive previous work on decarbonization pathways, both at the national (work from our national research institutions and from others) and global (work from the IPCC, the IEA, the GEA, etc.) levels, and is complementary to other current projects, in particular to the Global Commission on the New Climate Economy.

But the DDPP approach is unique because:

- **The national decarbonization pathways will be truly deep, i.e. consistent with the 2°C target.** Several studies have been looking at emission reduction trajectories to 2050, including at the national level. Global models have been looking at the implications of reaching the 2°C target, and they sometimes include regional and national details. But in most country-specific studies², the national emissions reductions, while they do sometimes represent a significant deviation from BAU, are usually not enough to meet the 2°C target. While these studies are useful to get accustomed to the challenges of decarbonization, and to identify some solutions to these challenges, they are also problematic: their implementation by countries would induce infrastructure and technology lock-ins, and eventually lead to unsafe levels of GHG emissions globally. Without ignoring or minimizing the challenges raised by deep decarbonization, it is therefore crucial that countries prepare pathways truly consistent with the 2°C target, since science tells us that levels of GHG emissions leading to higher temperature increases would induce unmanageable risks. In the DDPP, participants have agreed to use a limited number of criteria and methodologies to define the 2050 emissions

² With only a few exceptions, including some European countries (France, Germany, the UK, Denmark...) and some regions, such as California in the US.

reduction target for their country, including the convergence of per capita and per unit of GDP emissions, using both the production and consumption-based accounting methods, and the cost-optimization method included in the IEA World Energy Outlook (WEO) model.

- **The deep decarbonization pathways will be country-specific.** Many global scenarios have been developed to look at ways to reach the 2°C target. But the solutions coming out of these global studies are often – and sometimes rightly so – considered unrealistic by country experts, because they are based on inaccurate assumptions about technology potentials, or because they are obviously incompatible with the achievement of other important national economic, social and environmental objectives³. In the DDPP, deep decarbonization pathways are prepared by country teams comprising one or more local research institutions. The teams use their local knowledge and organize in-country expert consultations to develop practical pathways from their own national perspective. The ownership by local research institutions is very important to ensure that the research results of the DDPP are used as a basis from concrete policy discussions with domestic policy makers and businesses.
- **A sound and transparent process.** A sound, transparent, and cooperative process is critical for the success of the DDPP. All country teams and partners convene frequently by phone and in person to agree on common input parameters, a shared framework for producing the outputs, and – critically – exchanging on technology and other assumptions. The teams at the SDSN Secretariat and IDDRI coordinate the project on a day-to-day basis, but all modelling work is done locally, and structural decision with regards to the project are taken jointly by all country teams and partners. This approach ensures locally owned tools and results that reflect the specific needs of each country, but are part of a globally consistent and coherent approach towards mapping out a 2°C pathway. The reports issued by the DDPP will be co-authored by all participants of the DDPP.
- **The national decarbonization pathways will be practical.** A bottom-up technology-economic perspective will complement the typical macro-economic perspective of Computable General Equilibrium (CGE) models to lay out in great detail the content of deep decarbonization strategies in a transparent manner. Beyond that, the modeling analysis will be complemented and supported by off-model quantitative and qualitative analysis. The objective is to compensate for the shortcomings of some models, in particular the way some of them treat technological innovation and endogenous growth and represent – or don't – the functioning of electricity systems, to ensure that models are not an obstacle, but rather a tool, to analyze systematically the implications of deep decarbonization. In the DDPP, the national pathways will identify country-specific

³ There is, for example, an obvious tension between climate security and food security if the solution to deep decarbonization is the massive deployment of biomass with Carbon Capture and Storage (CCS), as is often the case in the results of global models.

solutions to the challenges of deep decarbonization including, for energy related GHG emissions: how to reduce energy consumption? How to decarbonize the power sector? How to electrify energy uses? All these elements will be organized into practical roadmaps.

The DDPP is uniquely positioned to have a major impact on domestic and international climate policy processes, including the September 23rd World Leaders Climate Summit and the COP21 of the UNFCCC, because:

- The **SDSN** was established by the UN Secretary General, Ban Ki Moon, and is working for the UN on the post-2015 development agenda, and on the preparation of the World Leaders Climate Summit.
- **IDDRI** has a long track record in conducting national and international modeling efforts on decarbonization pathways and is coordinating for the French government the track-2 process for COP21.
- **DDPP country teams in the 13 countries** comprise the leading research institutions on energy and climate change in their country. They have unmatched expertise on energy and climate issues in their country, for which they are often used by their government to provide policy advice. Their expertise is also recognized internationally, most of them having been involved in the work of the IPCC, the IEA, the GEA and other international projects and organizations.
- **DDPP partners** bring their well-known expertise and networks, including the International Energy Agency (IEA), the Massachusetts Institute for Technologies Energy Initiative (MIT EI), the International Institute for Applied Systems and Analysis (IIASA), the Potsdam Institute for Climate Impact Research (PIK), the Economie du Développement Durable et de l'Énergie (EDDEN) lab, the German Development Institute (GDI) and the World Business Council on Sustainable Development (WBCSD).

Organization

The DDPP is organized as follows:

- **The coordination unit** is led by the SDSN and IDDRI. It is responsible for the overall management of the project. Its role is to: provide the country teams with all inputs they need to prepare national deep decarbonization pathways, put inputs and outputs into a common reporting format; organize the collect of information from other partners to make sure the right assumptions go into the preparation of national deep decarbonization pathways; draft reports by the DDPP consortium; ensure that the results of the DDPP will contribute to a positive result of the September 23rd World

Leaders Climate Summit in New York, and to a successful conclusion of the UNFCCC negotiations during COP21 in Paris in December 2015.

- **Country teams** are responsible for the preparation of their national deep decarbonization pathways. Their role is to: provide in-depth country-specific analysis, based on previous work and new expert consultations, to make sure the deep decarbonization strategies prepared are relevant from their national perspective; and use their modeling capacity to analyze systematically the implications of deep decarbonization pathways for their country by developing new scenarios.
- **DDPP partners** (including the IEA, IIASA, PIK, EDDEN, the WBCSD) have agreed to share the results of their previous work⁴ and to mobilize their networks, to make sure consistent and up to date assumptions go into the preparation of the national deep decarbonization pathways. The coordination unit serves as an interface between them and the country teams.

Timeline and deliverables

The DDPP will publish a first report for the UN Secretary General, Ban Ki Moon, on July 1st, 2014. The UN Secretary General is regularly kept informed of the progress of the DDPP and looks forward to receive the results to contribute to the success of the September 23rd World Leaders Climate Summit. The report will be officially launched in New York just before the Summit during the second day of Leadership Council meeting of the SDSN on September 20th.

It will include one chapter for each of the 13 countries, 10-15 pages long each, plus a summary of the key findings, showing the key elements of deep decarbonization pathways, both globally, and for each country.

The DDPP will also publish a second report for the French Presidency of COP21. The precise date of publication of this second report is still to be determined, but it should happen sometimes during the first quarter of 2015. The French Presidency of COP21, including the President François Hollande, the Foreign Minister Laurent Fabius, the Minister Delegate for Development Pascal Canfin, and the Environment Minister Philippe Martin, are also counting on the results of the DDPP to contribute to their “positive agenda”, and to help them in the conduct of the negotiations.

Compared to the first report, this second report will include further elements on how to actually implement these national deep decarbonization strategies. It will provide some recommendations on the policies to be implemented to manage the transition costs of deep decarbonization pathways domestically, and on the technology cooperation and policy

⁴ Sometimes unpublished, such as the country results of the IEA World Energy Outlook 2°C scenario

coordination mechanisms to be put in place to accelerate to process of decarbonization globally.

After the publication of the first results in July 1st 2014, the national deep decarbonization pathways under development by the DDPP participants will serve as the analytical platform for additional climate policy analyses. Such work may focus on technology diffusion and innovation, policy frameworks, financing, governance arrangements for implementation, etc.

Discussions are currently under way with:

- The World Business Council on Sustainable Development (WBCSD) to build synergies between their vision 2050 and action 2020 business initiatives and the DDPP
- The World Economic Forum (WEF) and the Clean Energy Ministerial (CEM) to use the DDPP as the analytical framework to identify and roll out new climate initiatives within the WEF and the CEM
- The German Development Institute (GDI) to conduct country case studies (Germany, Australia, China and Indonesia or South Africa) on the political economy of the transition to a low carbon economy
- The Climate Bonds Initiative to use the DDPP as the basis for climate bonds standards definition and capital raising plans (starting with California)

Current status

The DDPP is now well advanced:

- The inception meeting was organized in Seoul, and hosted by the Korea Development Institute (KDI), on October 12 and 13, 2013.
- The second meeting was organized in Warsaw, during COP19 of the UNFCCC, on November 18, 2013.
- The third meeting was organized in Paris, from January 6 to 10, 2014, and included 3 days of technology roundtables in partnership with the WBCSD, and 2 days of modeling workshop in partnership with the IEA, gathering a total of 120 participants.
- The next meeting is planned for early April in Paris.

The SDSN and IDDRI are using their core funding to staff the coordination unit of the DDPP. The SDSN provided significant funding to the country teams to initiate their work, and in some cases to cover their total costs. All country teams are using their own resources, and in some cases have raised additional funds domestically, to contribute to the project.

Additional funding is needed in particular to support the work of country teams in: France, the UK, Brazil, China, India, Indonesia, Mexico and South Africa.

Annex: List of partner research institutions by country

Click logos for more information

Coordination Unit



Country Teams



Australian National University



National Institute for Environmental Studies, Japan



THE EARTH INSTITUTE COLUMBIA UNIVERSITY



DDPP Partners

