ISSN 2599-8293

European Commission

CORDIS Results Pack on

climate neutrality

A thematic collection of innovative EU-funded research results

May 2020

Pathways for achieving the European Green Deal objectives

Research and Innovation

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Editorial

Pathways for achieving the European Green Deal objectives

The European Union is committed to becoming carbon neutral by 2050. This move is necessary if we want to avoid dangerous climate change by limiting global warming to well below 2 °C and pursuing efforts to limit it to 1.5 °C, as agreed by the world's nations in the Paris Agreement. Firm action must be taken now to achieve this ambitious goal.

Horizon 2020-funded researchers have developed models and tools that are able to assess costs, risks, trade-offs and co-benefits of policies and investments, hence supporting administrations and businesses in taking the right steps towards a climate-neutral continent.

Carbon neutrality means net-zero emissions of greenhouse gases (GHG) such as carbon dioxide (CO_2). Whilst not an impossible mountain to climb, it requires a deep transformation across key emitting sectors and societies. Massive reduction in burning fossil fuels, greener technologies, cleaner transport, a more efficient and circular industrial base, and massive upscaling of renewable energy capacity will be at the heart of achieving this goal. Maintained societal momentum will need to support this Herculean effort. And of course, there's the matter of financing such transition.

Moving forward with the European Green Deal

The European Green Deal announced by the European Commission in 2019 lays the groundwork for the changes ahead of us. It is a comprehensive roadmap that details actions to reduce GHG emissions by boosting the efficient use of resources, restoring biodiversity and cutting pollution across the continent and beyond.

The route ahead envisioned in the Green Deal also outlines the investments needed and financing tools available, as well as concrete steps on how to ensure a just and inclusive transition that benefits everyone, thus encouraging large-scale societal acceptance. To capture political determination and provide direction, a European Climate Law is being put in place, turning the 2050 commitment into a legal obligation and a trigger for the investment needed.

The importance of EU research funding

Horizon 2020 – and starting from 2021, its successor Horizon Europe – are crucial for the implementation of the EU's climate policies and at the same time the wider Sustainable Development Goals.

This CORDIS Results Pack features eight projects from Horizon 2020's dedicated Societal Challenges funding stream (climate action, environment, resource efficiency and raw materials). Their outcomes show how policies and financing initiatives can steer the EU towards climate neutrality by embracing the complex interplay between the energy system, the economy and consumer behaviour.

We have listed the eight projects under three distinct sub-themes to better illustrate how these projects are contributing to GHG reduction and also to highlight the links and synergies between them.

Designing transformative policies

The largest group of projects, comprising **CD-LINKS, COP21:RIPPLES, DEEDS, EUCalc** and **INNOPATHS,** supports the **design of transformative policies** enabling the EU to transform its society and economy in line with the Sustainable Development Goals and the 2050 climate-neutrality ambition.

Coordinated development and climate policies, for wider acceptance and higher impact

It is widely acknowledged that sustainable development and climate action are two ends of the same spectrum. Yet, their complex interplay has yet to materialise in coordinated policy design underpinned by dedicated scientific research. CD-LINKS aimed to bridge this gap with extensive international research and low-carbon pathway development.

The CD-LINKS (Linking Climate and Development Policies – Leveraging International Networks and Knowledge Sharing) project specifically looked at interactions between climate policies and the United Nations Sustainable Development Goals (SDGs) to highlight the potential co-benefits of coordinated policy-making. From 2015 to 2019, the project team combined research on both issues with a view to strengthening evidence-based policy-making.

"Our work is of critical importance," says Volker Krey, Deputy Programme Director for Energy at the International Institute for Applied Systems Analysis in Austria. "Well-designed climate change mitigation policy can lead to significant co-benefits for a range of development priorities, but it can also lead to trade-offs if not managed properly."

Well-designed climate change mitigation policy can lead to significant co-benefits for a range of development priorities, but it can also lead to trade-offs if not managed properly.

To prevent this from happening, the project brought together research groups from within the EU of course, but also from Brazil, China, India, Japan, Russia and the United States. Together they empirically analysed the effects of past and existing policies with a climate or energy focus. They characterised policy designs that adequately account for trade-offs, and developed globally consistent national low-carbon pathways. Finally, they reviewed national action plans and international pledges.

Insightful results

The work led to many accomplishments. These include: a better understanding of the links between climate action goals and SDGs; and the realisation – while studying 17 global energy and climate policies – that policy-makers do not often consider complementary policies to strengthen synergies or alleviate trade-offs. To overcome this problem, the project proposes a new framework based on complementarity, transparency and adaptability to improve multiple-objective policy-making.

The project also provides insightful statistics on current efforts. For example, the team found that currently-implemented domestic climate policies would reduce global greenhouse gas (GHG) emissions by only 5 % by 2030. Most countries are not on track to meet their own nationally determined contributions (NDCs), and the global GHG emissions reduction expected from these NDCs will not allow the world to keep global warming to well below 2 °C.

Growing influence

Dissemination was a key part of the project, with the team even informing highly visible international assessments such as the IPCC's Special Report on Global Warming of 1.5 °C (IPCC SR1.5) and the UNEP emissions gap report.

By his own admission, Krey was even surprised with how far the project resonated amongst stakeholders. "When I was at the approval plenary of the IPCC SR1.5 in which I participated as scientific support for a government delegation, I was approached by a delegate who did not know about my involvement in CD-LINKS. He told me how he thought that research on interactions between ambitious climate policy and broader sustainability objectives from a project called 'CD-LINKS' or similar ought to be used to underpin some of the statements that were up for approval," he explains.

Such encounters might become more frequent as CD-LINKS-related publications keep being released, including one recently published in the prestigious journal 'Nature Communications' focusing on what current policies and the NDCs are expected to deliver in terms of emission reductions.

Several interactive online tools have been developed, making the project's low-carbon development pathways accessible to researchers and policy analysts, while a new Horizon 2020 project called ENGAGE is already building upon the CD-LINKS research.

"My hope is that the project will contribute to strengthening evidence-based policy-making. Obviously, this is a process which will take many years, if not decades, and a single project only contributes to a very limited extent, but shifting the entire policy process in this direction is highly desirable," Krey concludes.

PROJECT
CD-LINKS – Linking Climate and Development Policies – Leveraging International Networks and Knowledge Sharing

COORDINATED BY
International Institute for Applied Systems Analysis in Austria

FUNDED UNDER
H2020-ENVIRONMENT

CORDIS FACTSHEET
cordis.europa.eu/project/id/642147

PROJECT WEBSITE
cd-links.org

Different pathways for different contexts: A country-driven approach to accelerate climate action

Achieving the ambitions set out in the Paris Agreement is becoming more of a challenge with each day that passes. Far from giving up, the COP21:RIPPLES project suggests a way forward based on an integrated energy system assessment.

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Four years after the Paris Agreement, disillusioned voices have never been so loud. The United States has vowed to pull out and the perceived half-hearted nature of other countries' efforts is starting to show. There is now abundant evidence that the world is far from being on track to keep the global temperature rise well below 2 °C above pre-industrial levels.

As urgency grows, work under the COP21:RIPPLES (COP21: Results and Implications for Pathways and Policies for Low Emissions European Societies) project has never been so crucial. From 2016 to January 2020, the project team aimed to better understand what separates our current societies from their potential, Paris Agreement-compliant counterparts.

"Our work focused on means to overcome the technology, finance, policy and governance-related barriers to accelerating climate action," says Marta Torres Gunfaus, Senior Research Fellow at IDDRI and coordinator of the project. "We wanted to provide an integrated assessment of the energy system. The latter is based on the modelling and analysis of physical transformations required to meet the Paris Agreement mitigation goals, the socioeconomic implications of these transformations and the social sciences-based analysis of enabling conditions."

Going deeper: Not just an EU or global perspective

To stack all the odds in their favour, the project team combined this interdisciplinary analysis with a multilevel approach to research. Rather than focusing strictly on a global or EU perspective, the project team also aimed to understand the national circumstances, policy strategies and transition pathways of individual EU Member States and key non-EU countries.

Policy-makers seeking to increase the rate of decarbonisation must do so more explicitly and in collaboration with affected communities and sectors.

Such a strategy pays off, as most research findings soon highlighted. "Many of our findings make the case for country-driven approaches at national and local levels. These can effectively engage impacted communities and assess economic and societal transformations with clearly identifiable benefits," Torres explains. Such approaches could be used, still according to project findings, to improve the EU's 2030 commitment to ensure politically resilient decarbonisation pathways.

Of course, effective international cooperation is also imperative to meet the Paris Agreement goals, as Torres points out. "Our research shows that a number of gaps and opportunities exist for each of the sectoral systems. National strategies often fail to tap into the enabling potential of international cooperation and discussions. This applies also to the EU and its Member States, with the European Climate Law and existing governance regulation now providing an opportunity for enhanced governance."

Moving forward

Besides the country-driven approach, the project provides a range of recommendations for future decision-making. These include: favouring the already-mentioned sectoral approach; a multidimensional framework to assess the adequacy of global and country-level responses; early action on and investment in promising technologies; and challenging the financial system to fix its incapacity to deal with common goods and embrace 'long-termism'. Finally, the project calls for industrial transformation piloted by a transnational steel sector decarbonisation club.

Regarding the changing international context since 2016, Torres says that it only emphasises the need for transdisciplinary and multilevel approaches. "To date, much decarbonisation has been achieved by policy instruments that operate in a largely invisible way for most of society. When their effects in political, social and economic terms (for example in raising consumer prices) become apparent, they may lose legitimacy. To reduce this risk, policy-makers seeking to increase the rate of decarbonisation must do so more explicitly and in collaboration with affected communities and sectors. Transdisciplinary and multilevel research can provide a more textured response, embedded in the realities of the different geographies and sectors," she explains.

Now that the project has ended, Torres expects higher global ambitions to emerge from its recommendations.

PROJECT
COP21:RIPPLES – COP21: Results and Implications for Pathways and Policies for Low Emissions European Societies

COORDINATED BY
IDDRI in France

FUNDED UNDER
H2020-ENVIRONMENT

CORDIS FACTSHEET
cordis.europa.eu/project/id/730427

PROJECT WEBSITE
cop21ripples.eu

DEEDS project lines up cross-sectoral arguments in favour of decarbonisation

As the EU tentatively moves towards a post-lockdown era, the European Green Deal is now more topical than ever. Should we push it aside and go back to business as usual, or should we rather see the coronavirus pandemic as a unique opportunity to create a greener and more resilient economy? Whilst there is still much to be talked about and agreed upon, the DEEDS project has been laying some of the groundwork for Green Deal proponents.

The DEEDS (DialoguE on European Decarbonisation Strategies) project's efforts essentially revolve around two objectives: gathering the best knowledge about decarbonisation strategies, technology and innovation; and discussing and disseminating this knowledge with stakeholders from governments, industry, NGOs and research centres.

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To get there, the project brought together a network of leading scientists and a knowledge base of research projects related to European decarbonisation pathways. Together, they supported the High-Level Panel (HLP) of the European Decarbonisation Pathways Initiative (EDPI) in the creation of its final report. The report picks up where the Paris Agreement left off. It provides the means to its end in the form of research and innovation (R&I) to speed up and foster the mitigation of greenhouse gas emissions – while also improving the competitiveness of the EU economy.

Shifting tasks and stakeholder engagement

Although DEEDS existed before the European Green Deal was first conceived, its focus on building up a climate-friendly economy makes it particularly relevant for our times. As Adriaan Slob, Senior Researcher at TNO and project coordinator explains: "There are two main challenges at hand. First, the idea of a climate-neutral society has yet to be fully embraced as we can see with current debates. Circumstances in some Member States and fear of the consequences of pro-environmental measures call for research and innovation to gain better insights into possible technology pathways and quantify their impacts. Then, we know that the design of decarbonisation pathways must deal with many uncertainties. The pathways constantly need to be evaluated and benchmarked against new insights and developments."

We know that the design of decarbonisation pathways must deal with many uncertainties. The pathways constantly need to be evaluated and benchmarked against new insights and developments.

The HLP report particularly addresses the first challenge by providing R&I recommendations for the decarbonisation of the European society and economy, addressing for instance: energy production, mobility, industry, agriculture, cities, green finance, as well as (social) innovation and lifestyles.

"After the publication of the HLP report in November 2018, our tasks shifted towards discussing each chapter in a dedicated workshop with important European stakeholders. In this way we could test the support for the chapter's line of argument and recommendations," Slob explains. "Stakeholders could bring in their ideas, but we mostly noticed strong support for the recommendations."

Policy recommendations for a decarbonised future

DEEDS is set for completion in September 2020, and the project team is working on policy briefs building upon the HLP report and the workshop results. Slob says three of them are particularly innovative. "The topics of social innovation, cities, and innovation and finance are usually left out from discussions on decarbonisation strategies. Besides, our workshop 'Transformation to a climate-neutral society – the role of beyond GDP indicators' also introduced a novel element in the discussions." In the related report, the project consortium interestingly calls for policies to be informed by a more comprehensive set of indicators than just economic ones. By monitoring well-being in the broad sense (health, education, environmental quality, etc.), the team suggests that more informed policies could be created, generating more support from citizens.

The findings and recommendations of the DEEDS project can help governments in selecting appropriate R&I activities to align with the Green Deal. Generally speaking, they could help them work towards a more resilient, more sustainable and more prosperous future – all this while anticipating and minimising potential adverse impacts across society and business.

PROJECT
DEEDS – DialoguE on European Decarbonisation Strategies

COORDINATED BY
TNO in the Netherlands

FUNDED UNDER
H2020-ENVIRONMENT

CORDIS FACTSHEET
cordis.europa.eu/project/id/776646

PROJECT WEBSITE
deeds.eu

Online calculator reveals how you can help Europe in its fight against global warming

If you ever wondered what it would take for you, as a European citizen, business owner or decision-maker, to help the EU in its efforts to contain global warming, EUCalc has just the tool for you. Its intuitive pathways explorer considers all drivers of climate change in suggesting effective solutions.

The extent of change required to limit global warming well below 2 °C could easily make anyone's head spin. The number of pathways, technological options, behavioural changes and political reforms on the table certainly doesn't help. But what if we could simply go to a website, define a warming target, set what we consider as Europe's fair share of the global effort, and see exactly what it would take to get there? Such a tool exists, and it has been developed under the EU-funded EUCalc (EU Calculator: trade-offs and pathways towards sustainable and low-carbon European societies) project.

Introducing the EUCalc(ulator)

The project's 'Transition Pathways Explorer' starts off with two simple yet crucial questions. Do you want to limit temperature rise to 1.5 or 2 °C by 2050, and should Europe's share of the burden be calculated on a per capita or capability basis? Whilst the former calculates Europe's effort based on its population, the latter takes into account its above-average GDP to establish its fair share of efforts.

From there on, users access a number of interactive charts showcasing efforts to be displayed in 60 sectors of action. They can find out about the global benefit of actions taken in Europe and check scenarios where the rest of the world does or does not follow suit. Moreover – and this is a first for such calculators – the results use state-of-the-art global warming potential (GWP) calculations to consider emissions of different gases and convert them into CO_2 equivalents in terms of impact on climate.

Information for everyone

"The advantage of the calculator is that it does not only take into account technological changes," says Juergen Kropp from the Potsdam Institute for Climate Impact Research and EUCalc coordinator. "We know that technological progress alone is not sufficient to reach net zero in 2050, so EUCalc systematically considers the role of lifestyle changes in supporting the decarbonisation of Europe."

The tool is of great value to all stakeholders looking for suitable measures and their impact on global warming. It generates results in real time, responding to the users' ambition levels.

Suppose, for instance, that your objective is to decarbonise the agri-food sector. Thanks to EUCalc, you can look into different dietary patterns and land-use scenarios, consider intensification and extensification options, clearly identify the pros and cons of every option, and even estimate trade-offs and co-benefits with other decisions in, say, the energy sector. As Kropp puts it: "This approach helps actors go beyond one-eyed (or sectoral) views on the problem of global warming."

To ensure that everyone can use its model and tools, the EUCalc team designed them to be of intermediate complexity, with a specific version designed to reach younger people. This allows for providing very tangible drivers that citizens can relate to – such as distance travelled each year, number of passengers in a car, hours spent in front of a screen or amount of food wasted – while at the same time providing a working base for decision-makers.

For the first group, EUCalc is a bit of an eye-opener. For people tempted to marginalise the importance of individual actions, project results show that ambitious changes in lifestyles could actually result in greenhouse gas (GHG) savings of 40 % and 60 % by 2030 and 2050 respectively.

We know that technological progress alone is not sufficient to reach net zero in 2050, so EUCalc systematically considers the role of lifestyle changes in supporting the decarbonisation of Europe.

For decision-makers within economic sectors responsible for climate change, the project also provides important food for thought. For instance, it tells us that if the industrial sector was to introduce the full range of GHG reduction technologies, for example hydrogen-based chemical production, low-carbon cement production and a renewable energy mix, it could lead to a 90 % reduction in GHG emissions against a business-as-usual trend.

All in all, Kropp insists on the role of citizens' behaviour and hopes that the project will allow for the exploration of a wider set of decarbonisation options. "In an overarching sense, I would say that real carbon neutrality can be achieved only by concerted action across the economy, because obvious solutions in one sector can create negative side effects in other sectors. This is one of the major challenges in future sustainability planning," he concludes.

PROJECT
EUCalc – EU Calculator: trade-offs and pathways towards sustainable and low-carbon European societies

COORDINATED BY
Potsdam Institute for Climate Impact Research in Germany

FUNDED UNDER
H2020-ENVIRONMENT

CORDIS FACTSHEET
cordis.europa.eu/project/id/730459

PROJECT WEBSITE
tool.european-calculator.eu/intro

New models provide all-round, realistic pathways to decarbonisation by 2050

Meeting the Paris Agreement targets is challenging enough without having to choose between countless ways to get there. Yet, this is exactly the situation decision-makers across Europe find themselves in. The INNOPATHS project has set out to help them make the best possible selection of technologies for future energy systems.

For over 3 years now, the INNOPATHS (Innovation pathways, strategies and policies for the Low-Carbon Transition in Europe) team has been modelling pathways to decarbonising the energy system, as well as predicting the economic impact of these paths. This is invaluable information for decision-makers. Although they know exactly what needs to be done to get to zero greenhouse gas emissions by 2050, they could indeed easily find themselves overwhelmed with the scale of the challenge or unwilling to face a potential political backlash over measures that would exceed the limit of what's considered acceptable to voters.

"Of course, no one can be sure of the impacts of moving towards a zero-carbon energy system. We are dealing with complex connections between changes in the energy system and the economy, and we know that complex systems often respond to interventions in unexpected and sometimes counter-intuitive ways," says Paul Ekins, Director of the UCL Institute for Sustainable Resources and coordinator of INNOPATHS. "However, models can give valuable insights into these possible responses. This is precisely the approach of our project to increasing knowledge."

Ekins and his team focused on several aspects of decarbonisation. On the energy system front, they conducted a comprehensive analysis and assessment of available technologies, how they will change over time and the extent of adaptations they entail for our current energy system. From there, they investigated ways in which different sectors – energy, industry, transport, buildings and agriculture – would be impacted, as well as the role of the financial sector in bringing about decarbonisation. Finally, they assessed the impact of decarbonisation on labour markets.

"We are now seeking to bring all this information together in a global economic model. The latter will identify each European country separately so that we can give detailed insights for Europe at a country level, but within a consistently modelled global context," Ekins explains.

On the road to decarbonisation

Besides lifting the veil on decarbonisation measures and their consequences, the project also clarifies the different pathways or scenarios through which the zero-emission objectives can be reached by 2050. The team came up with a total of four scenarios.

The more I work in this area, the more convinced I become that the full decarbonisation of Europe is not only possible, but that it can lead to a prosperous society that is healthier and has a higher overall quality of life than today.

The first scenario is called 'New players and systems'. It is a high-electrification scenario with a high proportion of new generators and prosumers. The second, 'Incumbents' renewal', focuses on carbon capture and storage and/or nuclear energy driven by renewed political push. "End-use energy carriers do not substantially change, but the supply side does: solids, liquids and gases are supplied from bioenergy and power-to-x; BECCS (bio-energy with CCS) is widely used and hydrogen is added to gas networks where switching is easy," Ekins notes.

Then the third scenario is that of 'Efficiency and sufficiency', with very high levels of efficiency in buildings (high-spec retrofit and heat pumps) and transport (electrification), as well as shifts in industrial demand. Finally, the fourth scenario considers the 'Europe of multiple speeds', with different levels of ambitions and types of measures in different parts of the EU, and the different countries focusing on different mitigation approaches. As Ekins points out, each pathway also has a matching, consistent description of its social dimension.

"The more I work in this area, the more convinced I become that the full decarbonisation of Europe is not only possible, but that it can lead to a prosperous society that is healthier and has a higher overall quality of life than today. But achieving it will require a level of policy intervention and public understanding which is unprecedented, and I do not think it is there yet," he says.

As the project plans to provide its fully detailed modelling at the end of November 2020, decision-makers and other stakeholders will gain access to much more information than they ever had before. New tools are currently being developed to help them. These include i) a technology matrix tool with current and future estimated costs and uncertainties of technologies, ii) a policy assessment framework tool for better understanding of policy design for low-carbon strategies, and iii) an interactive decarbonisation simulator enabling users to shape their own vision of decarbonisation scenarios for all Member States, up until 2050 or even 2070.

Hopefully, this knowledge will strengthen their confidence in the creation of a zero-carbon society by 2050 that fully exploits its benefits.

PROJECT
INNOPATHS – Innovation pathways, strategies and policies for the Low-Carbon Transition in Europe

COORDINATED BY
University College London in the United Kingdom

FUNDED UNDER
H2020-ENVIRONMENT

CORDIS FACTSHEET
cordis.europa.eu/project/id/730403

PROJECT WEBSITE
innopaths.eu

Financing the transition

SOCLIMPACT and **COACCH** are two projects that are working on the impacts of climate change and adaptation needs, including required investments to reach climate neutrality.

Preparing islands to effectively deal with climate impacts

Researchers in the EU have developed a deeper understanding of how climate change will impact the economy and biodiversity of islands. Results from climate modelling and various socioeconomic analyses will be made available on a dedicated platform, helping policy-makers to make informed decisions for the future.

The EU project SOCLIMPACT was launched in December 2017 to study the impact of climate change on EU islands. Four important blue economy sectors were prioritised: coastal and maritime tourism; aquaculture; energy; and maritime transport. The project builds on a network of 12 EU islands located in different regions of the world.

"Islands are an exceptional laboratory for measuring the impacts caused by climate change and testing policies for adaptation and mitigation," explains SOCLIMPACT project coordinator Carmelo León from the University of Las Palmas de Gran Canaria in Spain. "Our aim was to build strong links between the scientific, business and policy-making communities in each region, and across the EU."

Fragile way of life

Some 15 million people live on more than 2 000 islands in the EU, which are especially vulnerable to climate change. Climatic modelling is often not available at the scale of islands, and resource limitations mean that island economies are often impacted disproportionately by climate change.

Island vulnerability is continuously increasing.

In sea level rise scenarios, countries will need to focus on protecting islands in order to safeguard their unique, valuable and fragile natural assets, on which socioeconomic activities, such as tourism, depend. Islands are already experiencing the dramatic impacts of rising sea levels for instance, the Maldives in the Indian Ocean and the Marshall Islands in the Pacific.

Islands can also find it difficult moving to renewable energy alternatives because of their modest size. They do not have the economies of scale for large infrastructure. There is therefore a need to develop efficient micro-generation alternatives to renewable energy.

Addressing climate change

León and his team saw that there was a real need to define and evaluate the impacts and challenges likely to occur under different climate change scenarios in islands. "Island vulnerability is continuously increasing," he says. "More detailed modelling and projection tools related to the potential consequences of climate change were needed, which take into account climate tipping points and low probability, high impact events."

To address these challenges, the SOCLIMPACT project brought business stakeholders and policy-makers together, and carried out various evaluations. The socioeconomic values of climate change impacts were explored based on literature reviews as well as fieldwork in sectors such as island tourism.

In order to integrate all project stakeholders, local working groups were established in each of the partner islands or archipelagos. An average of 15 to 20 stakeholders per island were involved, including public authorities and private sector representatives.

From this work, climate change impact chains in the four blue economy sectors were identified. Integrated socioeconomic assessments of expected climate change impacts on island communities were developed. "A total of 17 impact chains have been defined for the four economic sectors we looked at," says León. "There are, for example, nine specifically for tourism."

Understanding the unique challenges faced by islands is one step along the path to ensuring that communities are able to mitigate the worst impacts of climate change. The next step is ensuring that this knowledge is disseminated to those that need it, such as policy-makers, and that the tools to deliver meaningful change are made available. This is where the SOCLIMPACT project hopes to make a critical contribution.

"This is an ambitious, innovative project and our success will depend on the progress we make and on how well we can engage decision-makers," concludes León.

PROJECT
SOCLIMPACT – DownScaling CLImate imPACTs and decarbonisation pathways in EU islands, and enhancing socioeconomic and non-market evaluation of Climate Change for Europe, for 2050 and beyond

COORDINATED BY
University of Las Palmas de Gran Canaria in Spain

FUNDED UNDER
H2020-ENVIRONMENT

CORDIS FACTSHEET
cordis.europa.eu/project/id/776661

PROJECT WEBSITE
soclimpact.net

How COACCH is steering innovative research on complex climate change impact chains

Climate change can induce large – or extremely large – environmental or socioeconomic damage, and Europe is no exception. The EU-funded COACCH project aims to produce a comprehensive assessment of the risks and costs of climate change in Europe that can be consulted directly by all major end users from the research, business, investment and policy-making community.

The key objective of COACCH (CO-designing the Assessment of Climate CHange costs) is to develop technically excellent and innovative research on complex climate change impact chains, using downscaled climate information and advancing integrated assessment methods and models. The project has already taken an approach that proactively involves business, industrial and public decision-makers, as well as research stakeholders in the co-design, co-production and co-dissemination of policy-driven research, thus defining research questions that meet their collective interests and needs and increasing exploitation of results.

Its research promises to help significantly advance the knowledge and evidence base of socioeconomic tipping points. It supports the fine balancing act that must be delicately performed in order for the EU to successfully achieve its far-reaching climate ambitions, whilst also ensuring that citizens are fully supportive of the reforms and transformation needed to achieve them.

It has already posted some promising results. With regards to the European Green Deal, COACCH undertook an economic evaluation of the costs of climate change that was featured in the Green Deal factsheet 'Costs of Inaction', with its key messages being the fact that climate change could lead to a 20 % increase in food prices by 2050 and that the costs of heat-related mortality could amount to more than EUR 40 billion per year.

Other achievements include its most recent policy brief on the economic cost of climate change in Europe that helps shape the European Commission Mission Area 'Adaptation to climate change including societal transformation'. Another is its published 2019 paper on 'Meeting User Needs for Sea Level Rise Information: A Decision Analysis Perspective' in Earth's Future that has provided support to the IPCC for the completion of its Special Report on the Ocean and the Cryosphere in a Changing Climate.

The Horizon 2020 programme contributes directly to COACCH with a budget of nearly EUR 5 million. For more information on the project and its results, visit the dedicated COACCH website.

PROJECT
COACCH – CO-designing the Assessment of Climate CHange costs

COORDINATED BY
CMCC Foundation

FUNDED UNDER
H2020-ENVIRONMENT

CORDIS FACTSHEET
cordis.europa.eu/project/id/776479

PROJECT WEBSITE
coacch.eu

Mobilising industry

The **REINVENT** project has been providing solutions on mobilising industry that needs to transform and modernise – this is important as industry accounts for around 20 % of Europe's GHG emissions.

New decarbonisation approaches put industries on pathway to change

EU-funded researchers have taken a fresh perspective to mapping out possible transition pathways for carbon-intensive industries. Engineers, social scientists, climate experts and industry have worked together to deliver recommendations that take into account whole value chains, as well as considering issues such as consumer demand.

Photo by Karsten Würth on Unsplash

All industrial sectors need to achieve zero emissions in the future if we are to keep global warming to below 2 °C or 1.5 °C. The REINVENT (Realising Innovation in Transitions for Decarbonisation) project, launched in December 2016, has focused on several sectors that have been relatively slow to decarbonise, such as paper, steel and plastics.

These sectors all face different challenges. "All energy-intensive sectors – except perhaps paper – face the problem that decarbonisation could make their product more expensive," explains REINVENT coordinator Lars Nilsson from Lund University in Sweden. "This may be 20-40 % for steel and 50-200 % for primary plastics. They are all also locked in to existing assets and infrastructures."

Industrial processes also tend to be incredibly complex – another reason why industrial decarbonisation has often lagged behind transport and energy, and why a fresh approach to this issue is urgently needed.

Challenges of decarbonisation

The REINVENT project examined the whole value chain of each industry, looking holistically not only at specific processes in each sector but also at issues such as consumer demand and consumption.

"While we have decades of research in sustainable energy and transport, there is very little in the field of industrial decarbonisation," explains Nilsson. "We hope that our work will help to shape future visions for fossil-free industry, as well as ways of rethinking policy."

The project took into account links between industries, and brought in economics, geography and political science experts.

"We asked questions such as: Can we reduce demand? How much can we recycle? What is a reasonable level of plastics?" says Nilsson. "This is an important point, because Integrated Assessment Models – these big models that are used in IPCC reports to develop future scenarios – typically don't have good representations of mitigation strategies for industry."

Coherent industrial strategies

Drawing on this extensive fieldwork, the project has set out a series of priority areas for an industrial decarbonisation policy strategy. These recommendations include putting stronger pressure on industry to find and formulate coherent decarbonisation strategies, as well as developing strategies for managing obsolete industries and the phaseout or repurposing of plants and technologies.

Increased efforts are also needed to improve materials efficiency and reduce demand for materials. "This entails both push and pull policies," says Nilsson. "For example, demand-pull policies are needed for green materials that go beyond green public procurement." In addition, the project calls for strengthened capacities in government and academia to improve the availability of information.

REINVENT also provided an assessment of the recently published Masterplan for a Competitive Transformation of EU Energy-intensive Industries Enabling a Climate-neutral, Circular Economy by 2050, as well as the European Green Deal.

"These are excellent starting points for moving forward," says Nilsson. "In our assessment though, they could have included greater attention to materials-demand management, the particular challenges of the petrochemicals sector, and the need for capacity building."

Nilsson identified that demand issues and petrochemicals in particular are important to consider in the EU Industrial Strategy.

Furthermore, policy strategies to support successful transitions must: have a clear direction; push technology; articulate market demand pull; include governance capacity; and offer international policy coherence. Any EU approach to industrial decarbonisation policy must therefore be assessed against the international context in terms of implications for competitiveness and trade.

Different decarbonisation pathways for the steel, plastics and paper industries have been set out during the course of the project's work. Steel involves improved energy and materials efficiency, increased focus on circularity and new technologies. Plastics focuses on reducing or optimising use and production, increased circularity and making use of chemical recycling. Finally, paper focuses on efficiency and decarbonising paper production through fuel switching and diversification into biorefineries.

Our work will help to shape future visions for fossil-free industry, as well as ways of rethinking policy.

The project has successfully taken its message to both policy-makers and industrial leaders. Pathways to fossil-free basic industries and industrial policy implications were presented at COP25 in Madrid in December 2019, at a side-event titled 'EU Technology Transition for Industry – The Role of Research and Innovation Programmes'.

REINVENT is due for completion in December 2020, and Nilsson hopes that researchers will build on the project's successes to date, to dig deeper into the issue of industry decarbonisation.

PROJECT
REINVENT – Realising Innovation in Transitions for Decarbonisation

COORDINATED BY
Lund University in Sweden

FUNDED UNDER
H2020-ENVIRONMENT

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PROJECT WEBSITE
reinvent-project.eu

CORDIS Results Pack

Available online in six language versions: https://cordis.europa.eu/article/id/418144

Published
on behalf of the European Commission by CORDIS at the
Publications Office of the European Union
2, rue Mercier
L-2985 Luxembourg
LUXEMBOURG

cordis@publications.europa.eu

Editorial coordination
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This Results Pack is a collaboration between CORDIS and the Executive Agency for Small and Medium-sized Enterprises.

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linkedin.com/company/easme

Print	ISBN 978-92-78-42244-8	ISSN 2599-8285	doi:10.2830/721051	ZZ-AK-20-010-EN-C
HTML	ISBN 978-92-78-42246-2	ISSN 2599-8293	doi:10.2830/129894	ZZ-AK-20-010-EN-Q
PDF	ISBN 978-92-78-42245-5	ISSN 2599-8293	doi:10.2830/668502	ZZ-AK-20-010-EN-N

Luxembourg: Publications Office of the European Union, 2020

RESEARCH*EU MAGAZINE ISSUE 92

BIODIVERSITY: A NEW DEAL FOR NATURE

Biodiversity makes life possible. It nurtures us, provides multiple health benefits and even offers many opportunities for jobs and economic growth (tourism, green technologies, conservation efforts etc.). This issue of Research*eu features seven projects that are dedicated to developing new solutions that will help humanity reach a new deal with biodiversity.

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