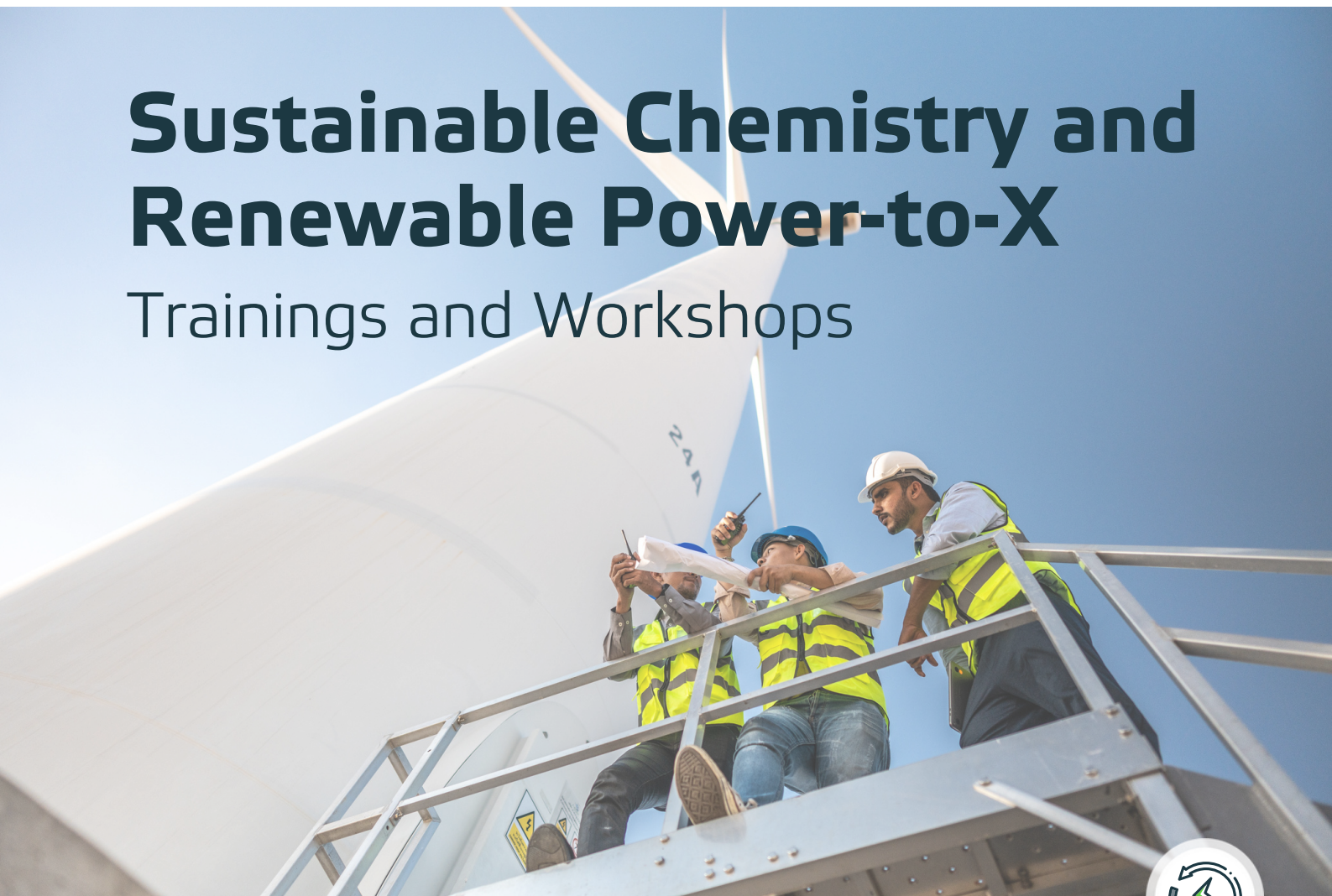


Sustainable Chemistry and Renewable Power-to-X

Trainings and Workshops



Introduction

International Sustainable Chemistry Collaborative Centre (ISC3) and the International PtX Hub promote Renewable PtX and Sustainable Chemistry, which play a crucial role for just and sustainable development. Both partners organise Human-Capacity-Development (HCD) measures such as training and workshops by and for experts to find the most promising strategies to cope with the challenging transition to a sustainable future and catalyse defossilisation globally.

Plain language

Producing electricity using wind or sun is good for people's health and for nature as well as for climate protection. But the machines using this renewable electricity can cause problems, e.g. harmful emissions. Experts and advisors from ISC3 and the International PtX Hub talk to people about the problems in their countries and develop solutions together.

The issue

One of today's biggest challenges in the energy sector is to solve the intermittency of renewable energy produced from wind and solar power. By storing energy in the form of chemical carriers, e.g. hydrogen, it can be used when needed, such as during periods of high demand or when renewable energy sources are unavailable. It can be used to provide fuel for transportation or as a feedstock for the chemical industry. As PtX technologies continue to develop, they have the potential to play an increasingly important role in the energy sector and help to mitigate the effects of climate change. **Renewable PtX** can contribute effectively to defossilise high-emission industries and contribute to **Sustainable Chemistry**. Our capacity development formats address how this can be achieved in a just transition.

The International Sustainable Chemistry Collaborative Centre (ISC3) is an international centre that fosters the transition of the chemical and related sectors to Sustainable Chemistry, promoting a circular economy in the value chain. The centre therefore takes a multi-stakeholder approach, targeting policymakers, the public and private sectors, academia and civil society.

ISC3 contributes globally to international chemicals policy, develops professional and academic training measures, offers advisory services, fosters innovations, supports entrepreneurship and conducts research. ISC3 is hosted by GIZ in cooperation with Leuphana University Lüneburg as ISC3 Research & Education Hub and DECHEMA Society for Chemical Engineering and Biotechnology (DECHEMA e. V.) as ISC3 Innovation Hub.

The centre was founded in 2017 on the initiative of the German Federal Ministry for the Environment, Nature Conservation, Nuclear Safety and Consumer Protection (BMUV) and the German Environment Agency (UBA).



The International PtX Hub is a centre of expertise and collaboration for innovative and sustainable green hydrogen and Power-to-X value chains. Through policy and regulatory advice, training and cross-sectoral stakeholder dialogue, the PtX Hub advocates for hydrogen and PtX approaches that promote sustainable market development. The PtX Hub has strong networks with industry, academia, policymakers and civil society, with hubs in Africa, Asia, Europe, and Latin America. With particular expertise in the aviation and shipping sectors, it is driving transformation efforts in these hard-to-abate sectors. The PtX Hub is implemented by the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH on behalf of the German Federal Ministry for Economic Affairs and Climate Action (BMWK) and financed by the International Climate Initiative (IKI).



Sustainable Chemistry

Sustainable Chemistry facilitates the needs of the present – without compromising the ecological, social and economic needs of future generations. It addresses global challenges such as climate, inequality and scarcity of resources.

Sustainable Chemistry goes beyond the full life cycle of products by including system thinking. This ensures that processes contribute not only to an increase in economic efficiency but also to a reduction of negative impacts on the environment and human health, while at the same time improving social responsibility. For more see the [ISC3's 10 Key Characteristics](#).



Renewable PtX

PtX (Power-to-X) stands for the use of renewable electricity to produce material products, represented by the 'X' in the name. X stands for a variety of products such as gases, liquids, solids or raw chemicals (such as green ammonia and e-kerosene).

In most cases, green hydrogen plays a central role as an intermediate step in the value chain. PtX can only be truly renewable and sustainable if the electricity is generated from renewable energy sources such as sun and wind. With PtX, high-emissions industries like the chemical and steel industry and transport sectors like aviation and shipping can defossilise and become climate-neutral.

What do the International PtX Hub and ISC3 offer?

The International PtX Hub and ISC3 empower individuals and organisations to make meaningful contributions to renewable energy PtX and Sustainable Chemistry through customised offers. The collaborative effort involves cultivating professional networks, promoting knowledge exchange, and fostering technological cooperation. By leveraging our expansive worldwide networks, we establish links between local and global stakeholders spanning various sectors, including public and private entities, academia, and civil society.

Our services include facilitating knowledge sharing amongst experts, offering advisory services to governments, e.g., developing sustainability strategies, publishing studies and data tools, and conducting training measures and workshops for key decision-makers. Our target regions are the partner countries of international cooperation.

Renewable PtX Training

The PtX Hub aims at creating a critical mass of people who are enthusiastic about renewable PtX and convinced that humankind can maintain and expand its prosperity without fossil fuels.

The Renewable PtX Training provides a comprehensive overview of the entire value chain of PtX. It looks at the potentials of renewable PtX in future energy systems and economies. Following completion of this course, participants are qualified to discuss and assess the potential production, application, and export of renewable PtX products.

Participants learn about the economics of renewable PtX products, transport, storage, and trade, as well as sector-specific markets, value chains and why sustainability (environmental, economic, social, governance) matters. The training is geared towards decision-makers, experts from authorities, researchers, regulators as well as civil society actors. The Renewable PtX Training typically includes three days: two days of lectures and a one-day country-specific and interactive transfer workshop by and for experts.



Training of Trainers (ToT)

The PtX Hub offers specific, comprehensive Train-of-Trainers programmes to disseminate knowledge on a national level in target countries and to extend the professional network. Several ToT events have already taken place. ISC3 prepared a customised ToT format for practitioners and engineers in the field of PtX. The first target country is Morocco in 2023. Further regions and online training for self-study will follow.



Transfer Workshop

ISC3 prepares the workshop contents and structure individually for each country and target audience, invites experts for presentations and organises the group work. After the workshop, ISC3 publishes white papers and fact sheets based on the strategic discussion and experts' contributions.

The aim of the workshop is to strengthen the knowledge obtained during training and apply it to the local conditions and issues in the target country (transfer) since there is no "one-size-fits-all" solution. ISC3 uses different interactive tools to involve participants in the discussion. Specifically, questions about unattended aspects of sustainability and various side effects have the top priority.



Add-On Modules

Starting in the summer of 2023, a dedicated add-on module on Sustainable Chemistry and Power-to-Chemicals (PtC) complemented the Renewable PtX Training (besides other add-on-modules on Renewable PtX). The theoretical part gives participants a comprehensive understanding of the multi-dimensional concept of Sustainable Chemistry. The PtC- part of the training delves into the practical processes of production, transportation and storage of ammonia, methane and methanol.



Cooperation in Uruguay and Morocco

ISC3 and the International PtX Hub conducted training events and three experts' workshops in Uruguay and Morocco in 2021 and 2022. Both countries are set to become global PtX frontrunners. Representatives of the countries' ministries of energy were trained and then involved in preparing a national strategy for renewable PtX and green hydrogen.

The PtX Hub trained the participants in a variety of important topics, from market forecasts and technologies to regulations on green hydrogen and Renewable PtX.

ISC3 led workshops to identify existing conditions, challenges, and next steps focusing on side effects, dimensions of sustainability and strategies for each country.

In May and June 2023, ISC3 and the PtX Hub organised a Training of Trainers programme for leading academic experts in Rabat, with the objective of creating a group of multipliers for Morocco.

Contact us:

ISC3 and the International PtX Hub are looking to intensify their international outreach on the relevant topics and seeking local and regional cooperation partners. If you are interested in promoting Sustainable Chemistry and Renewable PtX by implementing training measures and workshops, please contact us at: info@isc3.org and trainings@ptx-hub.org.



More information

Focus topic

Sustainable Chemistry and Renewable Energy

White paper

Towards a PtX Roadmap for Uruguay

Fact sheet

Towards a PtX Roadmap for Uruguay

Scoping paper

A framework for truly sustainable PtX

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