

Online Training

Clean Molecules for the Energy Transition

2 - 20 June 2025

Course Directors:

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Introduction

Despite a big ‘electrification first’ push in the EU, molecules still account for nearly 80% of the total energy mix. In pursuit of climate targets, strategic autonomy, and industrial reinvigoration, these largely fossil molecules are increasingly being replaced by electrolytic and bio-based ‘clean molecules’. The speed and depth of the transformation is creating significant complexity and uncertainty for business, governments, and citizens.

Clean molecules often require new technological value chains, new regulatory frameworks, and new business models. Moreover, in an era of rapid geopolitical change, the pace of policymaking and the strategic role of these versatile energy vectors is evolving more quickly than ever. The traditional energy trilemma of sustainability, security, and affordability has become more and more interconnected in the process, pushing clean molecule value chains into the focus of key industrial and security policy agendas.

The 2025 ‘Clean Industrial Deal’ provides a clear framework to link decarbonisation with economic resilience and competitiveness. By accelerating the deployment of clean energy and manufacturing, fostering lead markets, and promoting renewable and low-carbon hydrogen, it aims to scale both supply and demand. Moreover, bio-based gases have become much more competitive since the energy crisis, whilst their local availability and links to circular economy objectives have repositioned them as an important means of supporting various cross-sectoral objectives. Understanding the strategic role, regulatory context, and business case for these energy products is challenging but extremely stimulating and timely.

The ‘Clean Molecules for the Energy Transition’ course at the Florence School of Regulation is designed to bring you up to speed. Over three weeks – two weeks of independent study followed by one week of live sessions – you will gain in-depth insights into EU and global strategies, engage with real-world case studies, and participate in expert-led discussions and high-level panel debates, ensuring you stay ahead in this fast-moving field.

Course structure

Week 1 & 2 (2-15 June 2025) | Offline preparation to the course

Week 3 (16-20 June 2025) | Online live classes



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2 June **Welcome Class**

12:00-13:00 Welcome Class.

2-15 June 2025 *Go through the online materials and complete the relevant activities on the course platform.*

16 June **Clean Molecules in EU Policy**

09.15-09.30 Welcome and housekeeping.

Andris Piebalgs | Florence School of Regulation, RSCAS, EUI

James Kneebone | Florence School of Regulation, RSCAS, EUI

09.30-10.30 Lecture: EU Vision and Energy Challenges.

Andris Piebalgs | Florence School of Regulation, RSCAS, EUI

10.30-10.45 *Coffee break*

10.45-11.45 Lecture: ETS and CBAM.

Michael Mehling | MIT, University Strathclyde Law School

11.45-12.00 *Coffee break*

12.00-13.00 Lecture: EU Scenario Planning.

Carla Benauges | European Commission

13.00-14.30 *Lunch break*

14.30-15.30 Expert Panel: Industrial Competitiveness.

Moderator

James Kneebone | Florence School of Regulation, RSCAS, EUI

Panellists

Laima Eicke | RIFS

Joseph Dellatte | Institut Montaigne, Kyoto University

Ben McWilliams | Bruegel

15.30-15.45 Questions and closing.

17 June **Hydrogen and Synfuels**

09.15-09.30 Welcome and housekeeping.

09.30-10.30 Lecture: The role of renewable hydrogen and synthetic fuels in the energy transition.

David Parra | Iberian Energy Storage Research Centre, CIIAE

10.30-10.45 *Coffee break*

10.45-11.45 Interactive session: The Cost of Producing Hydrogen.

James Kneebone | Florence School of Regulation, RSCAS, EUI

Lecture: What does 'clean' mean?

Marco Buffi | European Commission Joint Research Centre

11.45-12.00 *Coffee break*

12.00-13.00 Lecture: EU Hydrogen Bank.

Johanna Schiele | European Commission

Lecture: H2 Global.

Martin Erdmann | H2 Global

13.00-14.30 *Lunch break*

14.30-15.30 Expert Panel: National Perspectives for a Hydrogen Economy.

Moderator

Christopher Jones | Florence School of Regulation, RSCAS, EUI

Panellists

Erik Rakhou | Rakhou Associates

Alejandro Nuñez-Jimenez | ETH Zürich

TBC |

15.30-15.45 Questions and closing.

18 June **Supply Chains and Justice**

09.15-09.30 Welcome and housekeeping.

09.30-10.30 Expert Panel: Social Implications of a Clean Molecule Economy.

Moderator

Andris Piebalgs | Florence School of Regulation, RSCAS, EUI

Panellists

Marie Dejonghe | University of Gent

Marine Cornelis | Next Energy Consumer

TBC |

10.30-10.45 *Coffee break*

10.45-11.45 Lecture: Security of Supply for Renewable Energy Supply Chains.

Norela Constantinescu | IRENA

11.45-12.00 *Coffee break*

12.00-13.00 Lecture: Transportation of Clean Molecules.

Fabian Neumann | Technische Universität Berlin (TUB)

Lecture: CCS Networks.

Adrien Nicolle | Florence School of Regulation, RSCAS, EUI

13.00-14.30	<i>Lunch break</i>
14.30-15.30	<p>Lecture: Technology leadership: NZIA, Clean Industrial Deal, CRM Act.</p> <p>Simone Tagliapietra Florence School of Transnational Governance, EUI</p>
15.30-15.45	Questions and closing.
19 June	Biogas and Externalities
09.15-09.30	Welcome and housekeeping.
09.30-10.30	<p>Lecture: EU Regulatory Framework for Hydrogen.</p> <p>Lukas Wernert European Commission</p>
10.30-10.45	<i>Coffee break</i>
10.45-11.45	<p>Group Work: Clean Molecule Investment Game.</p> <p>James Kneebone Florence School of Regulation, RSCAS, EUI</p> <p>Lecture: Emissions from Clean Molecules.</p> <p>Maria Olczak Oxford Institute for Energy Studies (OIES)</p>
11.45-12.00	<i>Coffee break</i>
12.00-13.00	<p>Lecture: Biogas and Biomethane.</p> <p>Anna Venturini EBA</p> <p>Lecture: Prospects for Biogas Market Growth in Europe.</p> <p>Marzia Sesini Florence School of Regulation, RSCAS, EUI</p>
13.00-14.30	<i>Lunch break</i>
14.30-15.30	<p>Expert Panel: Food vs Fuel? Competition for Resources in Bio and Circular Economy.</p> <p><i>Moderator</i></p> <p>Ilaria Conti Florence School of Regulation, RSCAS, EUI</p> <p><i>Panellists</i></p> <p>Sofia Chrysafi BP</p> <p>Fabio Gaetano Santeramo Robert Schuman Centre for Advanced Studies, EUI</p> <p>Marzia Sesini Florence School of Regulation, RSCAS, EUI</p>
15.30-15.45	Questions and closing.
20 June	Implementation and Scale
09.15-09.30	Welcome and housekeeping.
09.30-10.30	<p>Lecture: Learning from an Innovator.</p> <p>Tim Cholibois Enapter</p> <p>Group Work: Clean Molecule Investment Game.</p>

James Kneebone | Florence School of Regulation, RSCAS, EUI

10.30-10.45 *Coffee break*

10.45-11.45 Group Work: Clean Molecule Investment Game.

Panellists

Andris Piebalgs | Florence School of Regulation, RSCAS, EUI

James Kneebone | Florence School of Regulation, RSCAS, EUI

Marie Raude | Florence School of Regulation, RSCAS, EUI

11.45-12.00 Feedback session.