Radboud Summer School

Decarbonising Industry: Technology, Policy, and Societal Readiness

Course programme

11 – 15 July 2022

Radboud University

Contents

Course overview

Dates: 11 – 15 July 2022
Mode of study: on campus
Course fee: €400

Reduced fees:

- **€360** as an early bird discount for all applicants
- **€300** as an early bird discount for students and PhD candidates from and alumni of Radboud Summer School and Radboud University
- **€340** for students and PhD candidates from partner universities and Radboud University who apply after the early bird deadline (1 April 2022)

Industry is a major emitter of carbon, yet it remains central to the modern economy. In this course globally recognised experts provide a robust, interdisciplinary perspective on industry decarbonisation.

Energy-intensive industry is core to the European and global economy, being a substantive contributor to the GDPs of many developed and emerging economies and employing millions. Yet it is also a sector which is under immense pressure and needs to be transformed: It is responsible for around a third of global greenhouse gas emissions, while needing to be close to zero by 2050. If Europe and the globe are to meet its net-zero targets, a fast transition to a climate-neutral industry must take place. This is an interdisciplinary challenge par excellence, and the need for expertise to address it will only continue to grow.

Therefore, this course will provide a robust and in-depth understanding into how industry can be decarbonised, and what it will entail, from various disciplinary perspectives including: transition studies, economics, engineering, chemistry, political science, and social psychology. This will take place over five days and will consist of in-depth presentations by experts, and group projects in which participants will develop an interdisciplinary decarbonisation strategy and pathway for an industrial cluster, suggesting policies and technologies, and accounting for challenges, societal considerations, and economic realities. The course will then finish off with a keynote speaker and final presentations. Over the course of the five days key aspects of industrial transitions will be looked at such as recent policy developments, policy instruments, business models, the technologies and key methods required to reduce carbon emissions from industry (in general and by sector), societal readiness, and just transitions.

By the end of the course participants will be equipped with the necessary insight and expertise to understand the multi-disciplinary approach which is needed to effectively decarbonise industry. The course itself is co-hosted by Radboud University, Eindhoven University of Technology (the Eindhoven Institute of Renewable Energy Systems) and Climate Strategies, in collaboration with the Climate-Friendly Materials Platform and the Horizon 2020 C4U project. It will draw on experts from globally recognised universities and research centres such as UCL and DIW, and will involve speakers from industry, politics, and environmental organisations.

Course Leader

Prof. Heleen de Coninck
Technology, Innovation & Society, Eindhoven University of Technology
Department of Environmental Science, Radboud University

Heleen de Coninck is a full Professor of Socio-Technical Innovation and Climate Change at Eindhoven University of Technology since 2020, and an Associate Professor in Innovation Studies and Sustainability at the Department of Environmental Science at Radboud University Nijmegen's Faculty of Science since 2012. As a researcher, Heleen's main research focus is on the role of innovation and technology in the international climate negotiations, on policy for making energy-intensive industry climate-neutral, and on the viability and societal dynamics of new technologies for 1.5C-mitigation pathways. Heleen was a Coordinating Lead Author in the IPCC Special Report on Global Warming of 1.5C, and is currently a Coordinating Lead Author in the AR6.

Heleen has a background in Chemistry and in Environmental Science, specialising in climate change and atmospheric chemistry. Before joining academia, she worked for over 10 years at the Energy research Centre of the Netherlands (ECN). In 2009, Heleen finished a PhD, which she conducted alongside her work at ECN, on technology in the international climate regime, at the VU University Amsterdam, in collaboration with Princeton University in the United States.

Learning Outcomes

After this course you are able to:

- Understand and explain what opportunities and challenges decarbonisation poses for energy-intensive industries, such as steel, chemicals, and cement/concrete.
- Reflect on policy and societal engagement aspects of industrial climate transitions.
- Draw up evidence-based advice on how an industrial cluster can best respond to the decarbonisation challenge.
- Answer key questions related to the policy and technological requirements for industry decarbonisation.

Level of participant

- Master (advanced)
- PhD
- Post-doc (junior)
- Professional

This course is designed for

Advanced master's students, PhD candidates, young professionals and postdocs who want to gain a broad understanding of the challenges and opportunities of decarbonising industry, as they aim to contribute to the realisation of a climate-neutral industry, through their research or their current or future employment.

Admission Requirements

Proven interest in industrial decarbonisation, as evidenced by e.g. a master thesis, a publication, previous courses followed, or a motivation letter.

Admission Documents

- Motivation letter
- CV

Dates

11 – 15 July 2022

Application Deadline

1 June 2022

Mode of study

This course will be offered **on campus**.

Certificate

Not mentioned.

ECTS credits

Student workload at Dutch universities is expressed in ECTS credits. ECTS stands for European Credit Transfer and Accumulation System, a system widely used throughout the European Union. In the Netherlands, each ECTS credit represents 28 hours of work. We would like to point out that recognition of credits is at the discretion of your home institution. For this course you can earn 2 ECTS credits.

Study load

• Pre-course assignments/reading	4 hours
• Class attendance	24 hours
• Self-study	8 hours
• Assignment(s)	8 hours
• Presentation(s)	4 hours
• Other	8 hours
Total	56 hours

Assessment

A certificate will be handed out for actively participating and successfully completing one assignment and one presentation. The certificate will show the number of credits obtained.

Course organisation

Not mentioned.

Brightspace

During Radboud Summer School, you will have access to our online learning environment Brightspace. One month before the summer course starts you will receive more information about Brightspace and how to access it. In your online course you will find the schedule and course related documents and or reading materials.

Literature

Pre-course literature:	To be specified
Obligatory reading:	To be specified
Recommended reading:	To be specified further, but could include recent C4U and CFMP publications at: https://c4u-project.eu/deliverables-2/publications/; https://climatestrategies.org/projects/european-climate-friendly-materials-platform/

Preliminary day-to-day programme

The programme is a combination of in-depth presentations and a group project throughout the week, in which the participants work on how to advise an industrial cluster on what interdisciplinary decarbonisation strategy it could follow. The week will be finalised with an inspiring keynote speaker and the final presentations.

Day 1: Background.

- Core aspects of climate change (based on IPCC AR6) and industrial decarbonisation.
- An introduction to the largest industrial sectors: steel, chemicals, cement, and refining.
- Group formation.

Day 2: Technology.

- Deep-dive into current technologies and key methods needed to reduce carbon emissions from industry, outlined in general and per industrial sector.
- Limited time for group work.

Day 3: Environmental aspects, societal readiness and just transitions.

- What are the life-cycle aspects of industry, and methods to decarbonise?
- What are the methods (and outcomes of those methods) that assess societal readiness? How can citizens and stakeholders be engaged? What do just transitions mean in the context of industrial decarbonisation?
- Group work.

Day 4: Policy, business models and finance.

- What policy instruments (or combination of them), governance, business models and finance provisions are likely to work to decarbonise industry?
- Group work.

Day 5: Keynote and presentations

- Inspiring keynote speaker
- Presentations of class projects: advice to industrial cluster on interdisciplinary decarbonisation strategy.

Overall schedule Radboud Summer School

Radboud Summer School is more than an academic event, it also provides you with a unique opportunity to meet other international students and to broaden your horizon. Our participants come from all over the world and all have a different cultural and academic background. The summer school organization has carefully selected various social activities to bring you in contact with each other and to introduce you to the beautiful city of Nijmegen.

	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday
	Arrival & registration	Introduction	Technology	Society and environment	Policy and business	Keynote and project presentations
08.30-09.00		Welcome Coffee/Tea	Coffee/Tea	Coffee/Tea	Coffee/Tea	Coffee/Tea
09.00-09.30			Lecture 1: CCUS *Paul Cobden (Swerim)* tbc	Lecture 1: Life-cycle assessment: CO2 reduction in industry, CCUS and CDR *Kiane de Kleijne & Rosalie van Zelm* (RU)	Lecture 1: Policy instruments *Karsten Neuhoff (DIW)*	Keynote speaker
09.30-10.00		Opening Ceremony				
10.00-10.30						
10.30-11.00			Coffee/Tea	Coffee/Tea	Coffee/Tea	Coffee/Tea
11.00-11.30		Lecture 1: Introduction to the course and IPCC AR6 on mitigation *Heleen De Coninck (TU/e, RU)*	Lecture 2: Electrification and hydrogen *Richard van den Sanden (TU/e)*	Lecture 2: Societal readiness and stakeholder engagement *Vincent de Gooyert, Floris Swennenhuis (RU)*	Lecture 2: Governance and just transitions *Sanne Akerboom (UU/SIL)*	Project presentations
11.30-12.00						
12.00-12.30		Lunch Distribution bikes	Lunch	Lunch	Lunch	Lunch Hand in bikes
12.30-13.00						
13.00-13.30						
13.30-14.00						
14.00-14.30		Group formation	Lecture 3: Circularity and process intensification *Eric De Coninck (ArcelorMittal)*	Lecture 3: Politics of industrial decarbonisation in the EU and beyond *Milan Elkerbout (CEPS)*	Lecture 3: Business models *Amelia Mitchell (Element Energy)* tbc	Project presentations
14.30-15.00						
15.00-15.30	Registration of participants	Coffee/Tea	Coffee/Tea	Coffee/Tea	Coffee/Tea	
15.30-16.00		Lecture 2: Introduction to industrial sectors *Timo Gerres (Comillas)*	Lecture 4: System-level aspects *Gert Jan Kramer (UU/SIL) tbc*	Group work	Group work	Coffee/Tea
16.00-16.30						Certificate Ceremony Farewell Reception
16.30-17.00						
17.00-17.30						
17.30-18.00						
18.00-18.30						
18.30-19.00		Course leaders dinner/ Participants dinner				
19.00-19.30	Welcome reception					
19.30-20.00			Quiz night	Pancake Boat		
20.00-20.30						
20.30-21.00						
21.00-21.30						

time slot for course activities
time slot for social events

You can sign up for the social events in the online application form. You can find an overview of the various social events on our website:
https://www.ru.nl/radboudsummerschool/social-events/programme-overview/

Application

You can apply for this course online. More information on how to apply and a link to the application form can be found here: https://www.ru.nl/radboudsummerschool/application/how-to-apply/

Contact details

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