

# Advancing Exposure Science Education and Training in Europe: Progress and Future Directions

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Ireland's Global University



ISES Europe Councillor 'Exposure Science Capacity Building, Training & Education'

<https://ises-europe.org/>

# Background

- Chair of the Education, Training & Communication WG since 2018
- Published the framework
- Ambitions for developing exposure science curriculums







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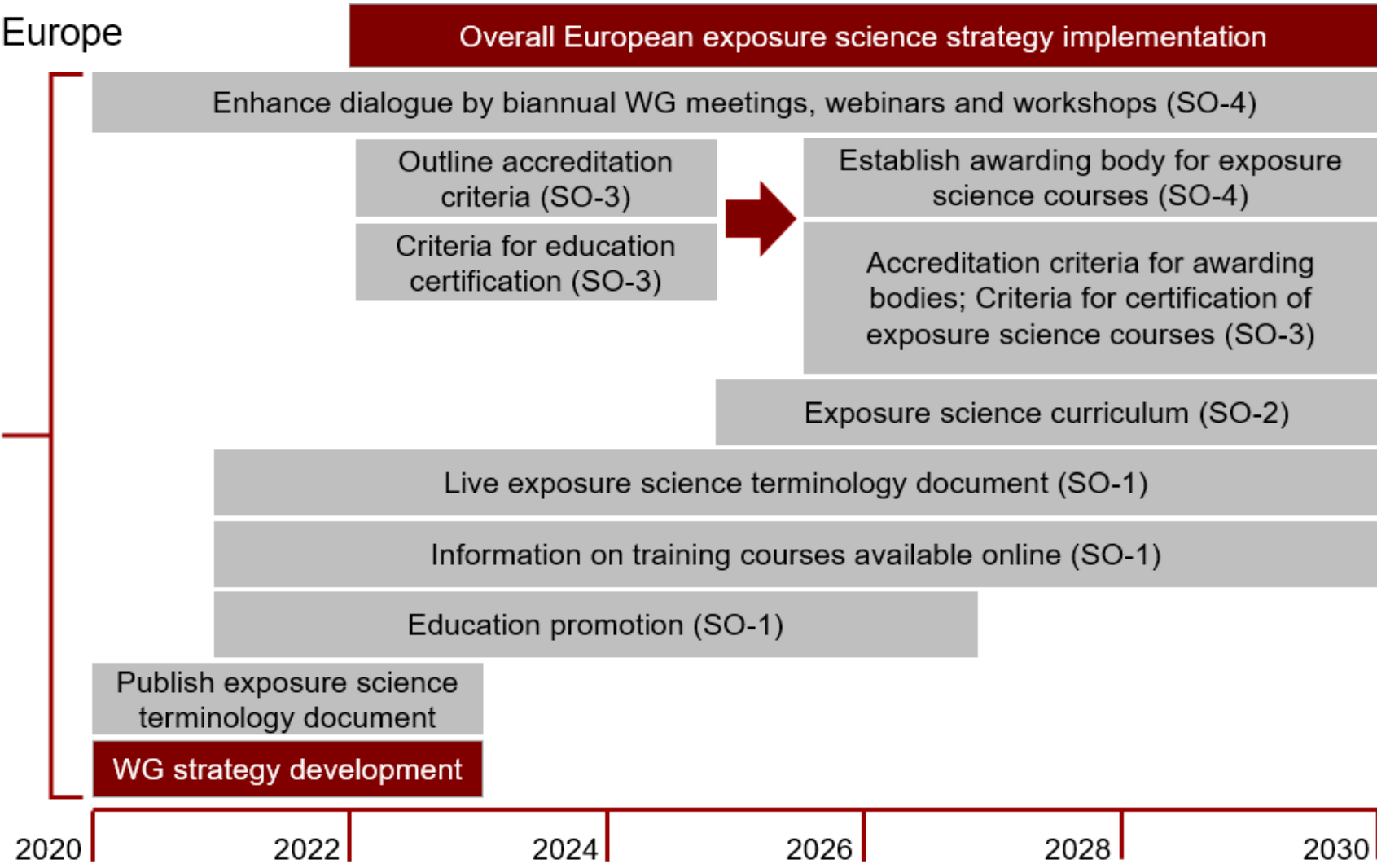
## Framework for developing an exposure science curriculum as part of the European Exposure Science Strategy 2020–2030

[Alison Connolly](#)<sup>°</sup>  , [Paul T.J. Scheepers](#)<sup>b</sup>, [Marie A. Coggins](#)<sup>°</sup>, [Theo Vermeire](#)<sup>c</sup>, [Martie van Tongeren](#)<sup>d</sup>, [Gerhard Heinemeyer](#)<sup>e</sup>, [James W. Bridges](#)<sup>f</sup>, [Susanne Bredendiek-Kämper](#)<sup>g</sup>, [Yuri Bruinen de Bruin](#)<sup>h</sup> <sup>1</sup>, [Anne Clayson](#)<sup>d</sup>, [Johannes Gerding](#)<sup>i</sup>, [Josephine McCourt](#)<sup>j</sup>, [Jan Urbanus](#)<sup>k</sup>, [Susana Viegas](#)<sup>l</sup>, [Natalie von Goetz](#)<sup>m</sup> <sup>n</sup>, [Maryam Zare-Jeddi](#)<sup>c</sup>, [Peter Fantke](#)<sup>°</sup>  

ISES Europe

Overall European exposure science strategy implementation

Working Group (WG) 'Education, Training & Communication'



## Strategic Objectives for Advancing Education, Training and Communication in Exposure Science in Europe

### **SO 1** *Exposure Science Promotion*

- Formal acknowledgement and recognition of Exposure Scientists

### **SO 2** *Exposure Science Curriculum*

- Formal Education and Training

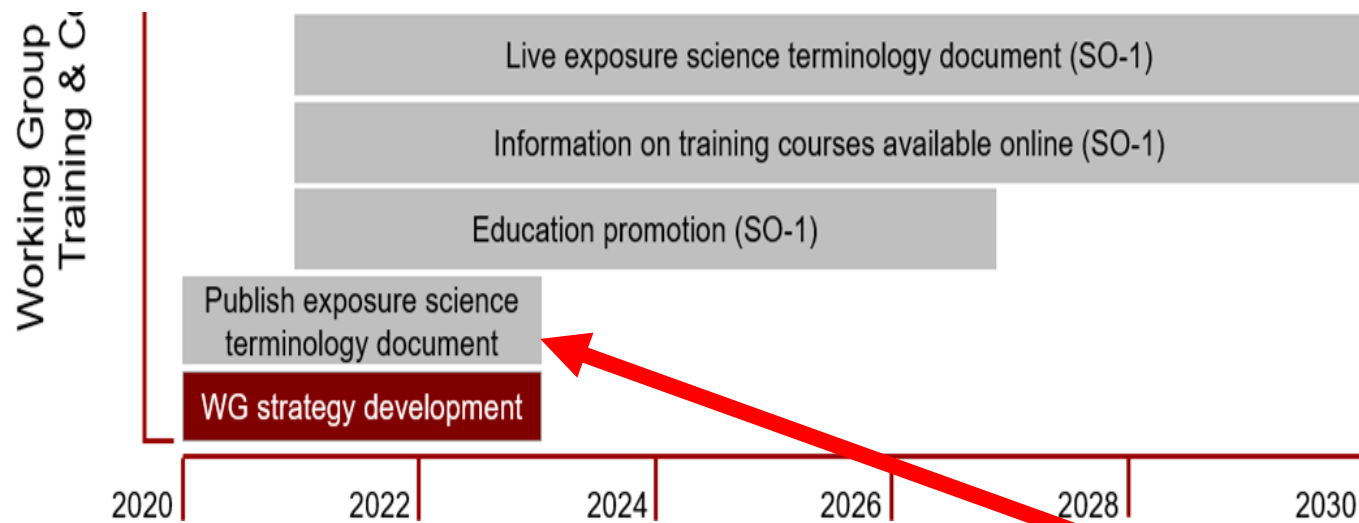
### **SO 3** *Recognition for exposure science courses*

- Certification

### **SO 4** *To enhance dialogue among exposure scientists*

- In person meetings
- Webinars/workshops





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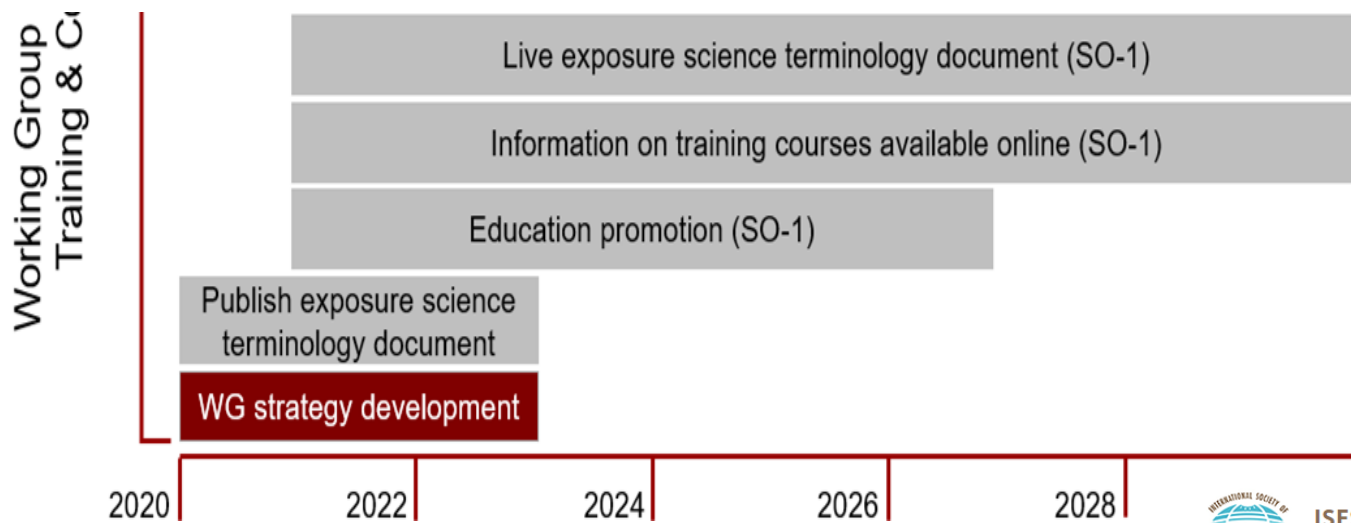
## Towards further harmonization of a glossary for exposure science—an ISES Europe statement

[Gerhard Heinemeyer](#) , [Alison Connolly](#), [Natalie von Goetz](#) , [Jos Bessems](#), [Yuri Bruinen de Bruin](#), [Marie A. Coggins](#), [Peter Fantke](#), [Karen S. Galea](#), [Johannes Gerding](#), [John D. Hader](#), [Henri Heussen](#), [Stylios Kephelopoulos](#), [Josephine McCourt](#), [Paul T. J. Scheepers](#), [Urs Schlueter](#), [Martie van Tongeren](#), [Susana Viegas](#), [Maryam Zare Jeddi](#) & [Theo Vermeire](#)

*Journal of Exposure Science & Environmental Epidemiology* **32**, 526–529 (2022) | [Cite this article](#)

1627 Accesses | 7 Citations | 14 Altmetric | [Metrics](#)





## ISES Europe (Europe Regional Chapter of the International Society of Exposure Science)

Together, we build a European Exposure Science Strategy

- HOME
- ABOUT US
- MEMBERSHIP
- GET INVOLVED
- NEWS / BLOGS
- EVENTS
- WORKING GROUPS
- EXPOSURE PLATFORM

### Exposure Science Glossary of Terms -- an ISES Europe Chapter statement

[View](#) [Edit](#)

The proposed glossary is intended to be broadly applicable in different areas of exposure science. The definitions given in the referenced documents were taken verbatim, as cited. If adaptations were necessary, the citation was mentioned with "based on", and the respective change explained.

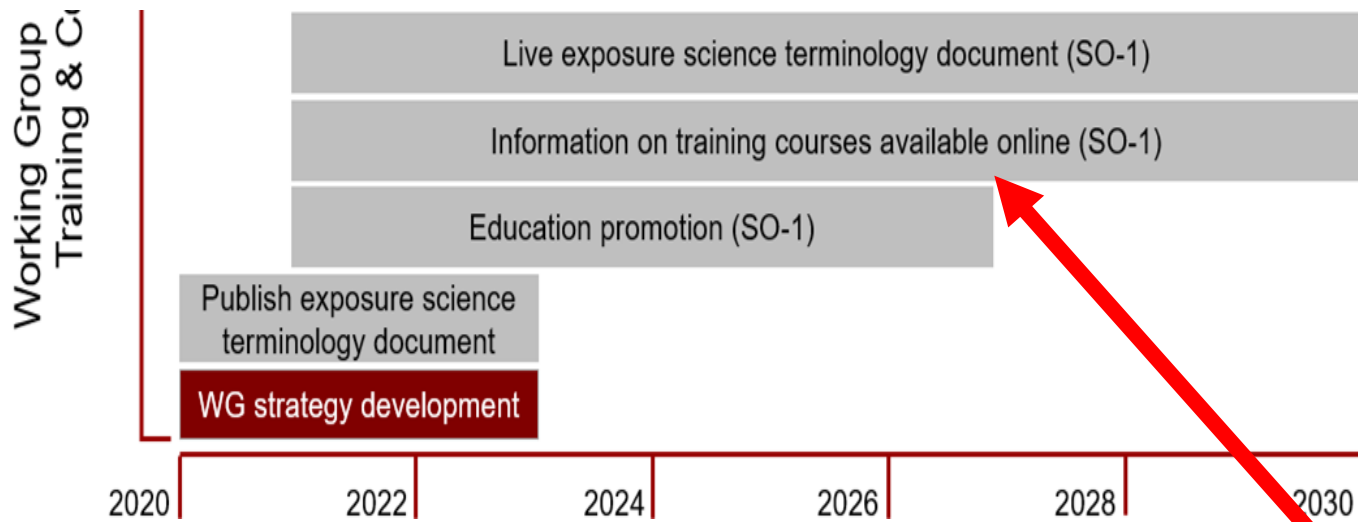
If the ISES Europe proposal is entirely based on a definition from an authoritative organization, it is referenced as such. In the case that an important term had not been defined in one of these official glossaries, definitions proposed in other publications have been taken into account (e.g. for the term "exposome"). If no reference at all was available, a definition was provided by the involved experts and the field "defined in glossary" is blank.

Proposals without a reference are definitions formulated and agreed upon by ISES Europe exposure scientists.

This excerpt is from the 'Towards further harmonization of a glossary for exposure science—an ISES Europe statement', Helnemeyer, G., Connolly, A., von Goetz, N. et al. published in the *Journal of Exposure Science & Environmental Epidemiology*

Term	Defined in Glossary	ISES Europe Definition
Absorption barrier	US-EPA (2011)	Any exposure surface that may retard the rate of penetration of an agent into a target. Examples include the skin, respiratory tract lining, and gastrointestinal tract wall (US-EPA, 2011).
Activity pattern data	US-EPA (2011) WHO/IPCS (2004, part 2)	Data that characterize the habits/behaviour of the target population (WHO/IPCS, 2004, part 2).





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### Exposure Platform

Interested in learning more or further your education in the field of exposure science? [Check out these courses](#) that are offered in the Europe region.

#### Exposure platform

[Data & Information Sharing](#)

[Funding and Jobs](#)

[Exposure science training courses](#)

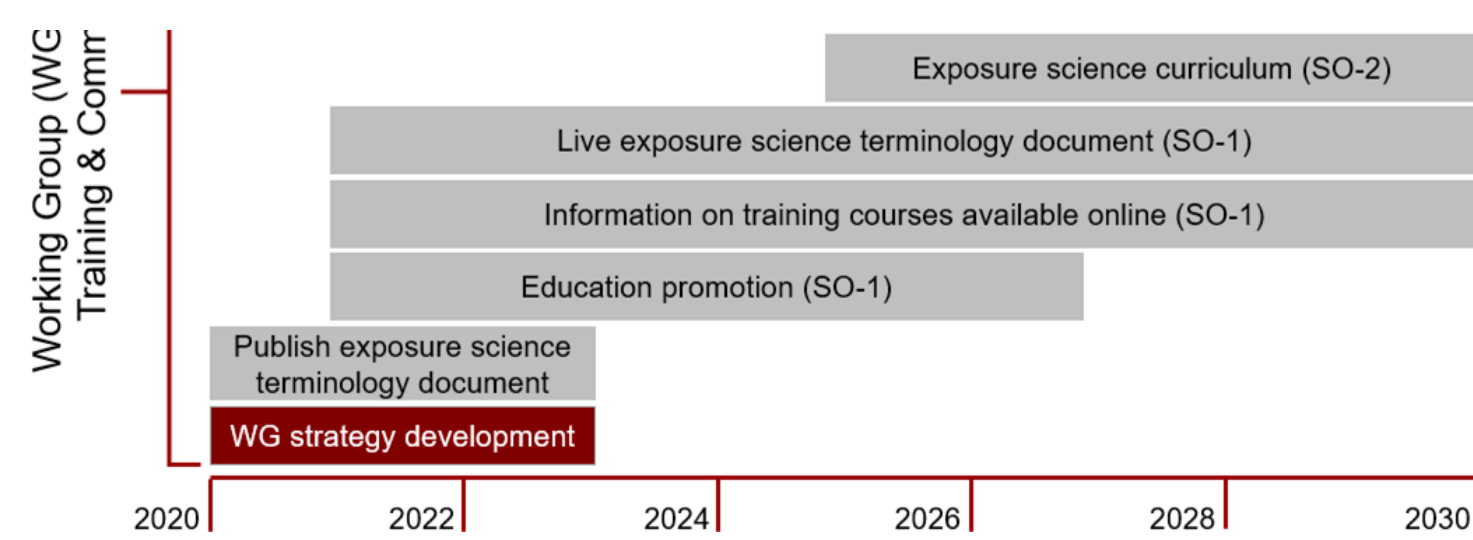


## Strategic Objectives for Advancing Education, Training and Communication in Exposure Science in Europe

<b>SO 1</b> <i>Exposure Science promotion</i>	➤ Formal acknowledgement and recognition of Exposure Scientists
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## Framework for developing an exposure science curriculum as part of the European Exposure Science Strategy 2020–2030

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# Learning Outcomes

A. Connolly et al.

Environment International 168 (2022) 107477

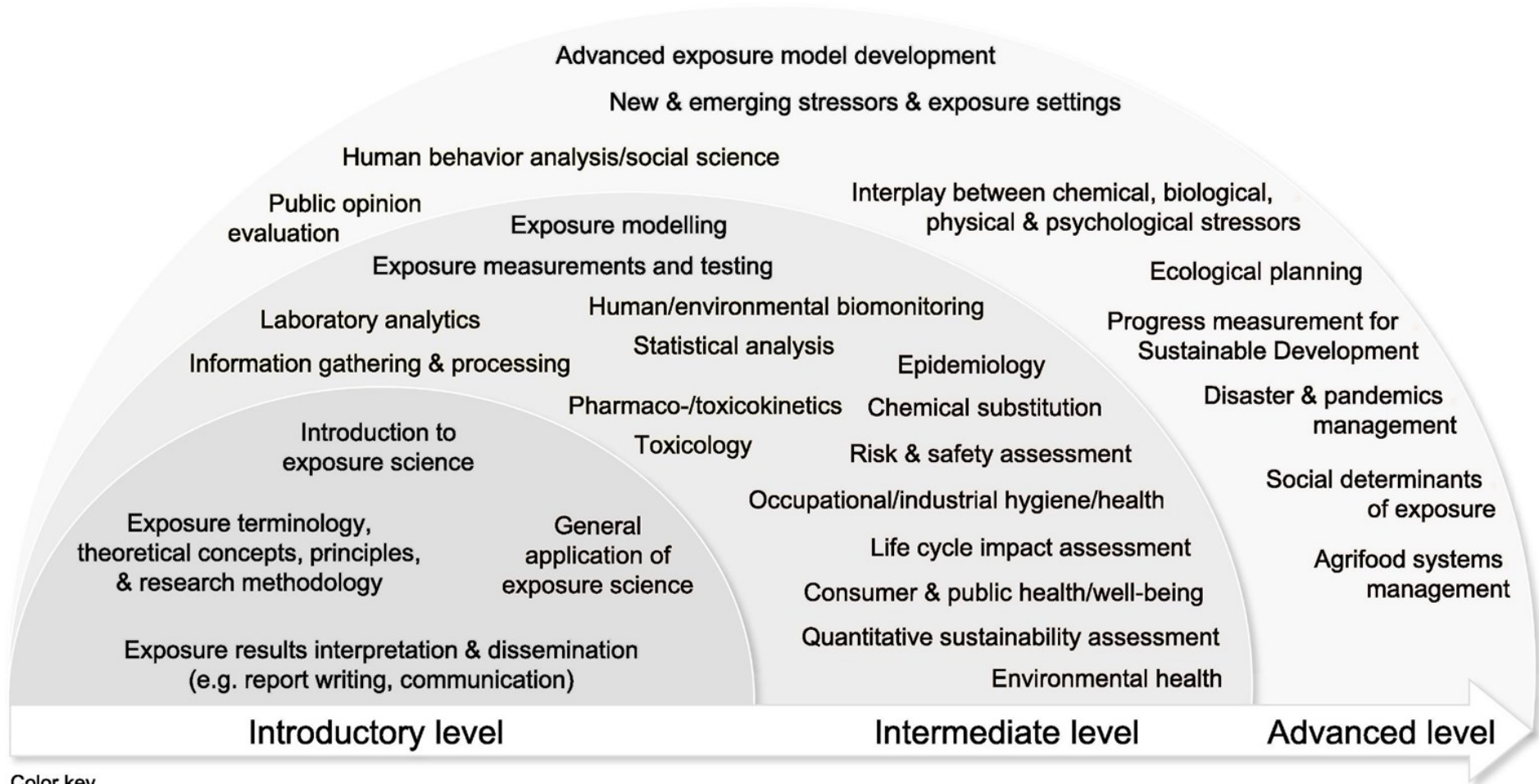
**Table 1**

Learning outcomes for exposure science curricula at each qualification level are defined by the European qualifications framework (EQF). I: introductory or general short courses. P: specialised short courses or continual professional development courses.

	Levels as per the European Qualification Framework (EQF)					
	1–4: I	1–4: P	5	6	7	8
Expected career pathways	Various	Specialised professional qualifications <sup>(1)</sup>	Technician	Supervisory role	Junior management role/early stage researcher	Academia/Post-doctoral researcher/Senior management

1. Knowledge
2. Skills
3. Competence





Color key

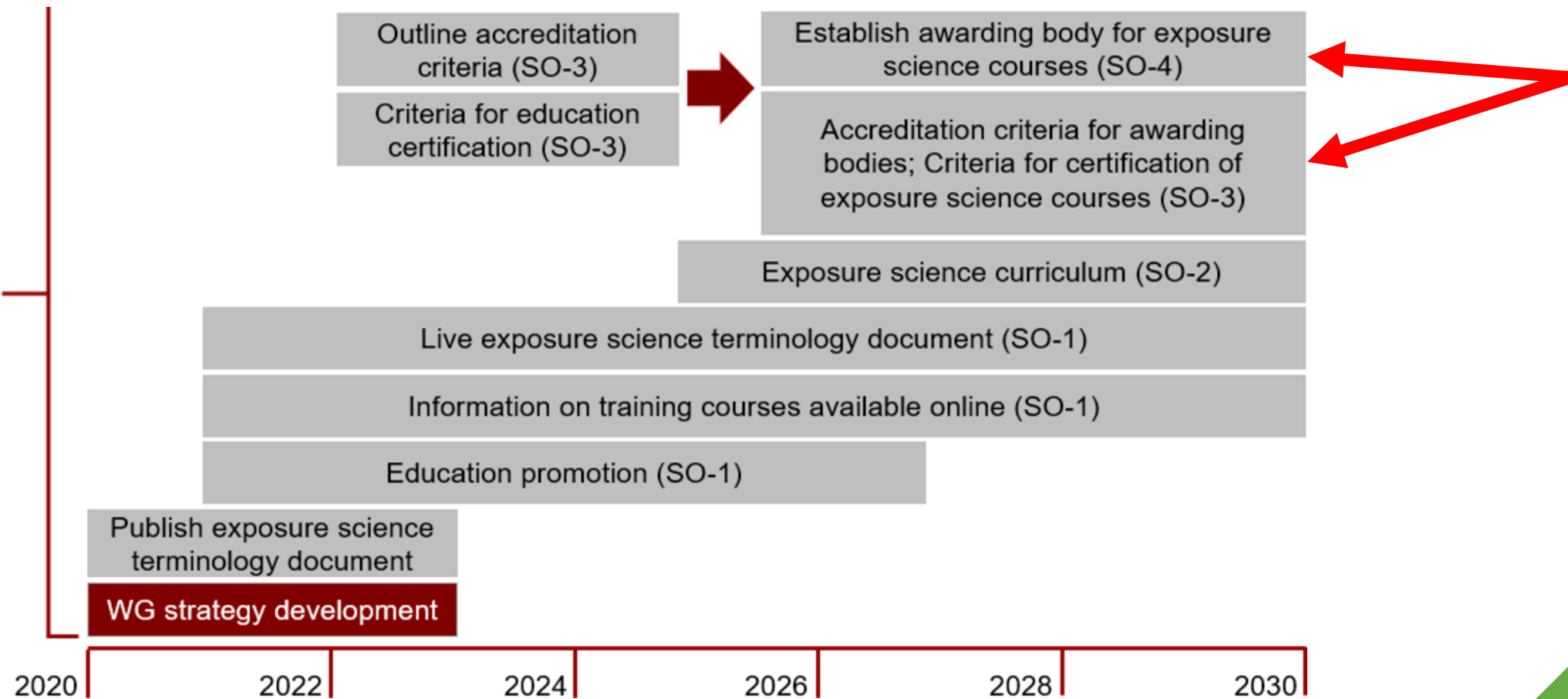
Skills: Generic exposure science theory & analysis | Methodologies relevant for exposure science | Specific contexts & practical exposure application fields



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Working Group (WG) 'Education, Training & Communication'



# Exposure Science Certification



Support awareness



Support creation of an (ES) identity



Establish a recognized profession



Improve the competency of Exposure Scientists



Introduce a quality control system

# Define the domain expertise for Exposure Science

## Professional qualification program

*Establish a training repository  
(self-study course)*

Professional portfolio

MCQ Exam

## Qualification of Exposure Science courses

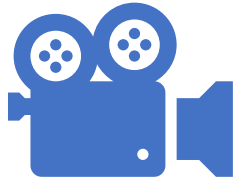
*Develop an example  
curriculum*

Graduates obtain professional qualification

## Continuous recertification



# Create Learning Materials



~1-hour videos on different aspects of exposure science



Additionally supplementary information materials



Each presenter provides questions for the MCQ exam





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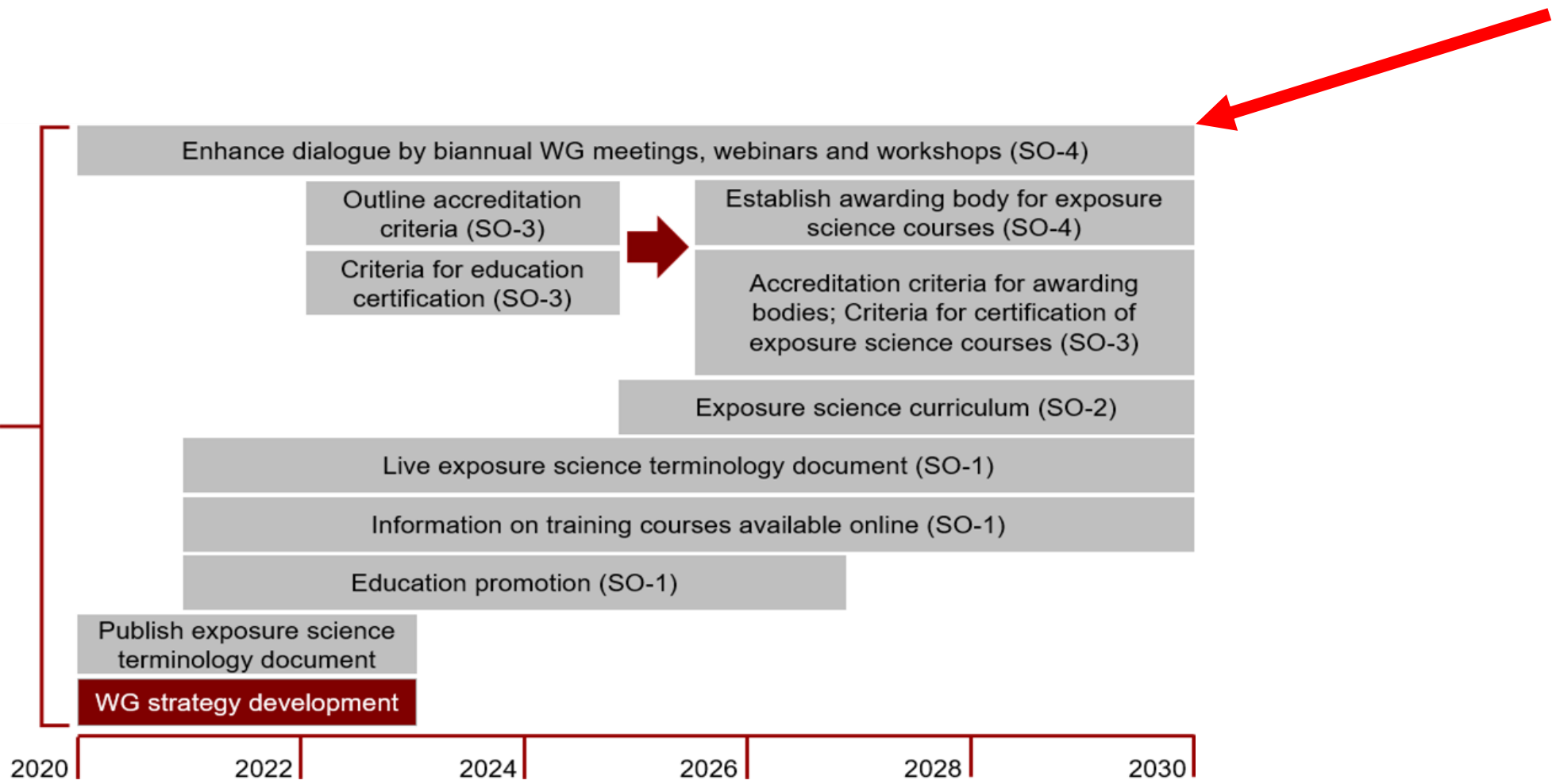
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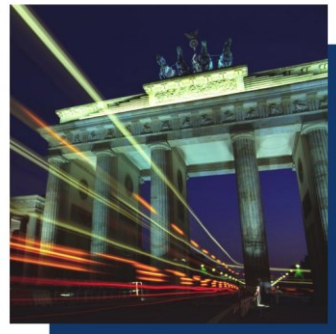


# Enhancing Dialogue among Exposure Scientist



**Save the Date**  
ISES Europe  
Workshop 2024

March 19 – 21, 2024  
Location: German Federal Institute for Risk Assessment  
Diedersdorfer Weg 1, 12277 Berlin  
[ises-europe.org/events/ises-europe-2024](https://ises-europe.org/events/ises-europe-2024)



ISES Europe (Europe Regional Chapter of the International Society of Exposure Science)  
Together, we build a European Exposure Science Strategy



**ISES-Europe 2018**  
19-20 June 2018 | BAuA, Dortmund (Germany)

1<sup>st</sup> European Exposure Science Strategy Workshop  
BAuA, Lecture Hall, Haus 1 (main building)  
Friedrich Henkel Weg 1-25, Dortmund, Germany



# Presenting to other audiences



Advancing Worker Health Protection  
9th - 13th June | Aviva Stadium | Dublin

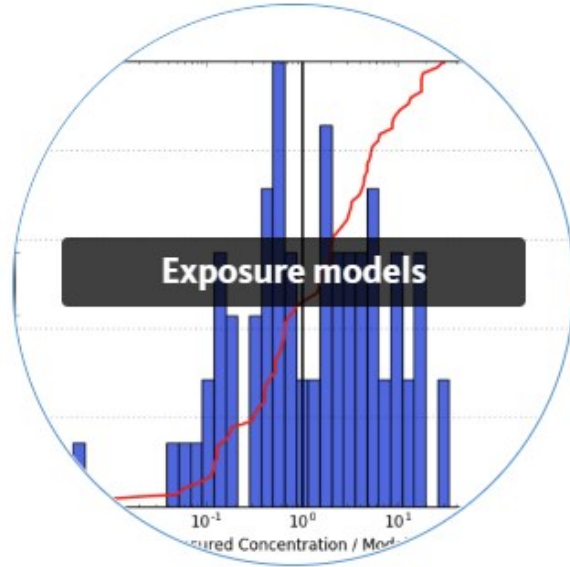
[Book Tickets →](#)



09:00 - 10:00	<b>Session 6A Presidents Suite</b> European exposure science strategy data and methods to informing stakeholders
	Elevating Exposure Science: Fostering Education, Training, and Communication in Alignment with the European Exposure Science Strategy (2020-2030) <b>Alison Connolly</b>
	Exposure modelling in Europe: how to pave the road for the future as part of the European Exposure Science Strategy 2020-2030 <b>Urs Schlüter</b>
	Advancement of exposure science and its application in occupational hygiene <b>Paul Scheepers</b>
	Human biomonitoring in practice: Minimum information requirement for human biomonitoring studies in occupational settings <b>Maryam Zare Jeddi</b>



# Working Groups



# COST Action

- Applied for funding
- 40 Proposers
- Across 21 countries



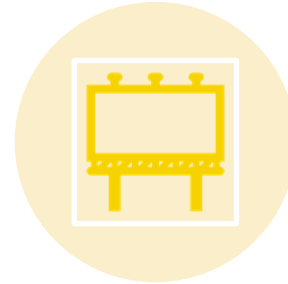
Outcome in Early April



# Discussions



Skills/knowledge and competencies required?



Marketing – is the demand there?



What courses are you seeking (i.e. part-time/full-time)



Graduates with defined career pathways



# Supporting the Development of Programmes



Input from Industry/public bodies/academia – What Are Your Needs



Commitment to sending Employees to undertake the programmes



Becoming certified exposure scientists



Industry showcases how employees they have sent to the programme shaped and enabled their industries potential – advertise the programme through their networks



**Want to learn more?**



# ISES working group (WG) breakout session: open to all

**Workshop Session: Education, Training and Communication  
Working group session**

**Date: 20th of March 2024, 15:00 – 16:00**

**Room: D146**

**Chair: Alison Connolly  
Moderator: Gerald Bachler**



<https://ises-europe.org/>

Establishing a framework for exposure science certification:

*Enhancing professional competencies and  
strengthening exposure science identity*

**Oral Session: O6 - Other exposure related topics**

**Date: 20th of March 2024, 16:30 - 17:30**

**Room: D145**

**Presenter: Gerald Bachler**

**Co-authors:** Alison Connolly, Natalie von Goetz,  
Steven Verpaele, Maryam Zare Jeddi



<https://ises-europe.org/>

# ISES working group (WG) breakout session: open to all

**Workshop Session: Parallel session**

**Date:** 21<sup>st</sup> of March 2024, **10:45 – 11:30**

**Room:** **D146**

**Chair:** Paul Scheepers

**Moderator:** Gerald Bachler



<https://ises-europe.org/>

# Acknowledgements to all the Working Group

- Alison Connolly
- Gerard Bachler
- Paul Scheepers
- Marie Coggins
- Johannes Gerding
- Jan Urbanus
- Susana Viegas
- Angelika Derler
- Conor Buggy
- Peter Fantke
- Natalie von Goetz
- Maryam Zare Jeddi
- Karen Galea
- Anne Clayson
- Steven Verpaele
- Oliver Lindtner
- Audric Mathuren
- Christiane Wiemann
- Susanne Bredendiek-Kämper
- Martie Van Tongeren
- Gerhard Heinemeyer
- Yuri Bruinen de Bruin
- Jim Bridges
- Theo Vermeire



# Thank you! Questions?

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Want to know more or become ISES Europe  
ETC Working Group team member?

Email: [Alison.Connolly@ucd.ie](mailto:Alison.Connolly@ucd.ie)

X: @ISES4EU

Website: <http://ises-europe.org>

Facebook:

<http://facebook.com/ISESEUROPE>

