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Conference of the Parties to the Convention on the Transboundary Effects of Industrial Accidents

Thirteenth meeting

Geneva, 27–29 November 2024

Item 3 of the provisional agenda

Industrial safety of the energy transition:

(a) Seminar on the global energy transition: Strengthening industrial safety to address emerging issues

(c) Decision on work on the industrial safety of the energy transition under the Convention

Industrial Safety of the Energy Transition (ISET) Survey results

Note by the Secretariat

I. Background and mandate for the ISET Survey

1. The energy transition is essential for the success of the decarbonization agenda. Due to the scale and speed with which the transition process is unfolding regionally and worldwide, new challenges and needs for strengthening the transition's industrial safety dimensions emerge.

2. In recognizing the growing needs of member States in this critical domain, the Bureau decided at its fifty-third meeting (Helsinki, 11-12 October 2023), as a first step, to establish the Small Group on the Industrial Safety of the Energy Transition (ISET-SG) to lead further work in this area, with the support of the secretariat. Furthermore, the Bureau tasked the ISET-SG, among other things, to initiate a process of consultation with member States in the form of a survey to understand better their needs and expectations under the fast-evolving strategic environment. The survey enabled the Bureau to review the results of this consultation process at its fifty-fourth meeting (Geneva, 13-14 June 2024), as a means to support the development of the draft decision, for the Conference of the Parties, on the industrial safety of the energy transition that focuses on options for future work under the Convention (ECE/CP.TEIA/2024/3).

3. The ISET-SG, at its inaugural meeting (online, 11 December 2023), defined the key modalities for the member States' survey on ISET and requested the secretariat to update the questionnaire on the basis of the ISET-SG's feedback and circulate the survey questionnaire in February/March 2024. The second ISET-SG meeting (online,

16 April 2024) came to the conclusion that the Bureau should be informed about the results of the survey and be invited to consider the potential submission of the updated paper with the survey results for consideration at the thirteenth meeting of the Conference of the Parties.

4. The survey was circulated on 13 March 2024 to the Convention's Focal Points, as well as Bureau, Working Group on Implementation and Joint Expert Group on Water and Industrial Accidents members. In total, 28 responses from 21 Parties and one non-Party ECE member State were received.¹ One more country at the time of preparation of this report had requested for an extension of the deadline for the submission of the survey.² All ECE sub-regions and 50 per cent of the Convention's Parties are represented. Although most responses came from ministries/agencies dealing with emergencies and environment, there was broad participation across different ministries, which included ministries/agencies of environment, emergency services, energy and labour, confirming the cross-sectoral nature of the issue of the industrial safety of the energy transition.

II. Key Survey Results

5. This section presents an overview of key takeaways organized according to the survey questionnaire's subsections. The Annex to this document contains the main results of the survey in more detail.

A. Key findings on Energy Transition Challenges

6. Key findings from the survey's section "Energy Transition Challenges" include the following:

- The primary concerns reflected in the survey are "Regulatory Catch-Up with emerging technologies and innovation" (68 per cent) and "Lack of basis for hazard and risk assessment" (57 per cent).
- Less than one quarter of the respondents (22 per cent) rated their country's industrial safety infrastructure and current knowledge in dealing with energy transition challenges as "Advanced" or "State-of-the-Art". Almost two thirds (64 per cent) opted for "Adequate", while 14 per cent rated it as "Inadequate".
- Renewable sources (96 per cent) and Hydrogen (75 per cent) topped the list of energy sources used for the transition, followed by Methanol (50 per cent), Natural Gas (50 per cent) and Ammonia (42 per cent).
- Standards for new energy technologies are clearly in development, according to 61 per cent of responses, with most development focus on Hydrogen and Ammonia.

B. Key findings on Regulatory and Policy Framework

7. Key findings from the survey's section "Regulatory and Policy Framework" include the following:

- When asked about the effectiveness of their country's current regulatory and policy framework (RPF) in ensuring industrial safety during the energy transition, only Natural Gas was rated as "Very effective" by more than 50 per cent of respondents. All other ratings were below the 50 per cent mark: Renewables (39 per cent), Methanol (36 per cent), Ammonia (29 per cent) and Hydrogen (25 per cent).

¹ Armenia; Austria; Belarus; Belgium (Flanders); Bulgaria; Cyprus; France; Luxembourg; Monaco; Montenegro; North Macedonia; Norway; Poland; Portugal; Romania; Serbia; Slovakia; Sweden; Switzerland; United Kingdom of Great Britain and Northern Ireland; Ukraine; and Uzbekistan.

² Azerbaijan.

- Hydrogen RPF was rated as “somewhat ineffective” by 14 per cent of respondents, the worst rating among the various options.
- **Considering** that renewable sources and Hydrogen topped the list of energy sources used for the transition (see previous section), **the relatively low ratings of the regulatory and policy framework in these areas render them “hotspots” for further policy consideration and regulatory improvements.**
- One of the most conclusive findings of the survey is that **89 per cent of the respondents considered that there is a need for international collaboration in framing industrial safety regulations of the energy transition:** 50 per cent answered “Yes, significant” and 39 per cent answered “Yes, to some extent”.

C. Key findings on Risk Management and Emergency Preparedness

8. Key findings from the survey’s section “Risk Management and Emergency Preparedness” include the following:

- Another key finding of the survey is that when asked to rate their country’s level of **prevention of** and **preparedness for** industrial accidents during the energy transition **three quarters of Parties indicated that they are only moderately prepared (71 per cent) or even unprepared (4 per cent) for prevention. The ratings were similar at the preparedness front: 68 per cent “Moderately prepared” and 4 per cent “Unprepared”.**
- The biggest challenges in managing risks associated with new energy technologies were topped by “Lack of Expertise” (64 per cent), followed by “Lack of knowledge” (46 per cent) and “Lack of hazard/risk assessment basic documents” (36 per cent).

D. Key findings from Future Outlook and Support

9. Key findings from the survey’s section “Future Outlook and Support” include the following:

- When asked “What kind of support is most needed from international bodies like UNECE?”:
 - “Technical Guidelines” came at the top of the lists, selected by 82 per cent of respondents and followed by
 - “Training and Workshops” (54 per cent);
 - “Technical Expertise” (46 per cent);
 - “Enhanced International Regulatory Framework” (39 per cent); and
 - “Policy guidelines” (32 per cent).
- The Long-term Strategy of the Convention until 2030 (LTS) is largely seen as “fit for purpose” by 89 per cent of participants, even if not explicitly covering energy transition as part of its Trends.
- When asked “What are your long-term goals in the area of industrial safety amid the energy transition?”:
 - “Enhanced environmental/industrial safety” topped responses with 82 per cent, followed by
 - “Exchange of best practices” (82 per cent);
 - “Strengthening regulations” (57 per cent);
 - “International collaboration” (54 per cent);
 - “Technological advancements” (54 per cent); and
 - “Workforce development” (36 per cent).
- Considering the above findings, particularly that three quarters of the respondents feel only moderately prepared or unprepared for the new challenges and that 89 per cent see a need for international cooperation, seems

to suggest that there is a particular need in the future for the development of technical guidelines, exchange of good practices and conduct of related trainings and workshops.

III. Conclusions and next steps

10. The ISET Survey was prepared in order to assess the needs and expectations of member States, in line with the decisions taken by the Convention's Bureau at its October 2023 meeting, as refined and operationalized by the ISET-SG at its inaugural meeting in December 2023.

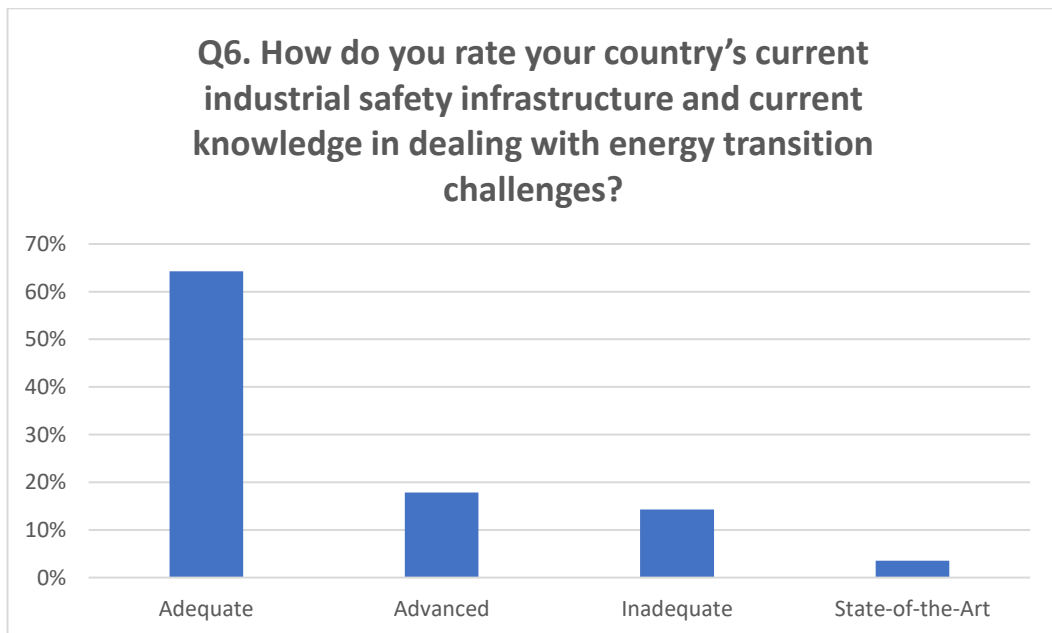
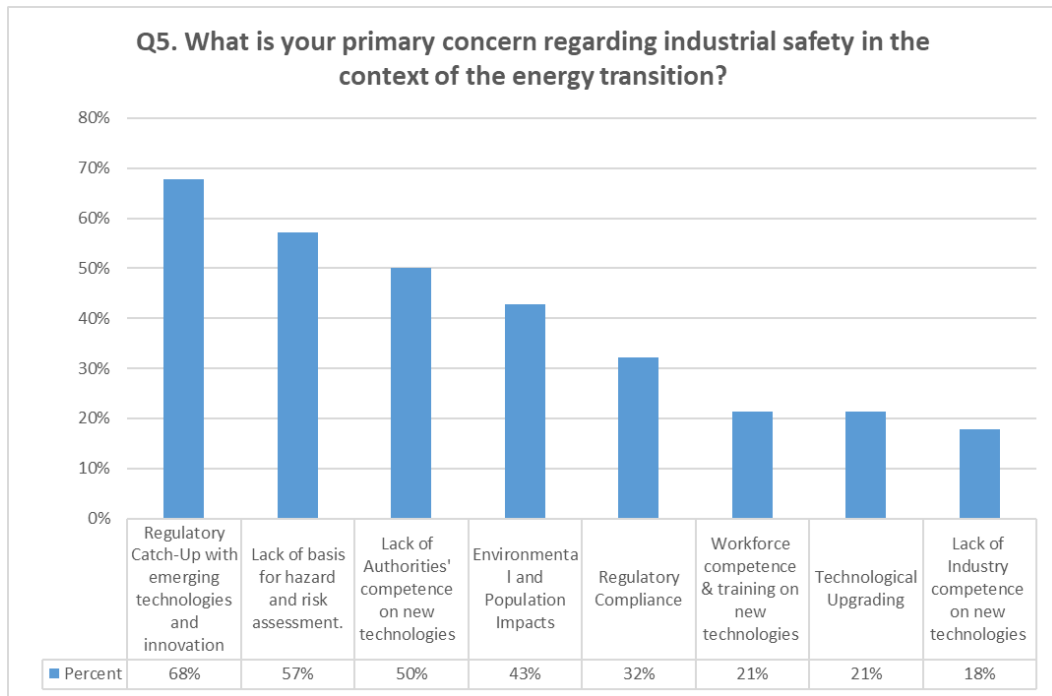
11. Two overarching conclusions can be derived from the survey:

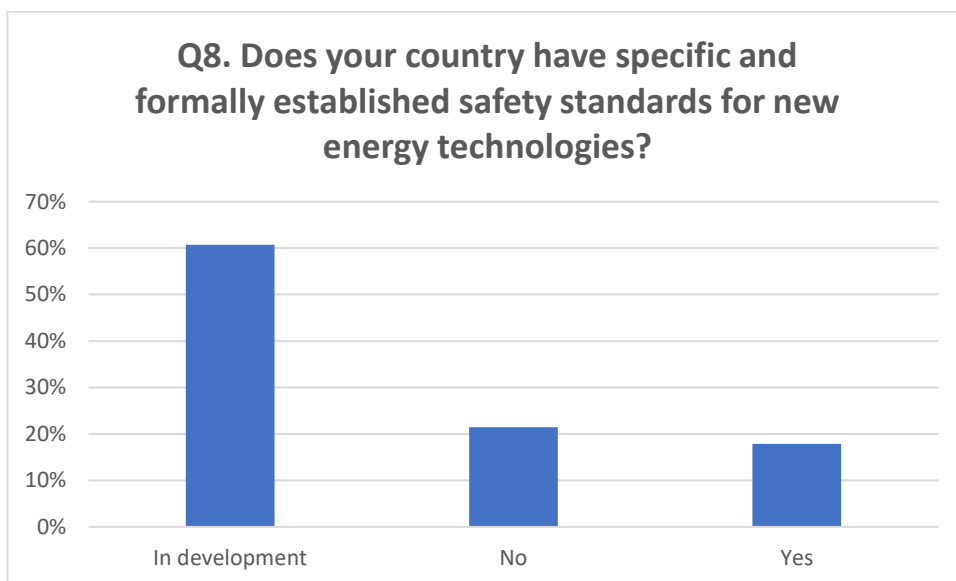
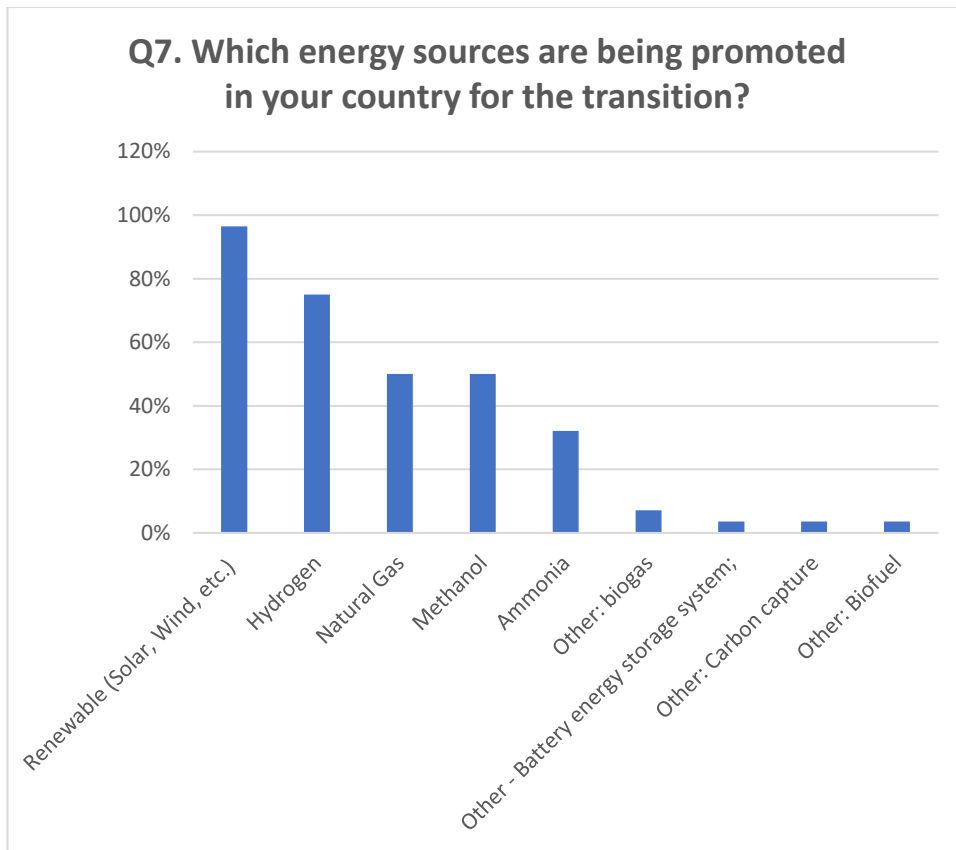
- (a) First, further work at the national and international level on ISET is not only warranted but also needed, based on member States responses. The level of development of standards, technical guidelines, risk-assessment tools and knowledge base and other key requirements for a solid and effective regulatory and policy framework nationally and internationally are overall lacking. Thus regulators, communities, industry/operators and other key stakeholders are not yet in position to establish a very effective regulatory system/framework that enhances the industrial safety of the energy transition.
- (b) Second, there is overwhelming agreement that international cooperation is needed. Member States identified the following areas where UNECE could contribute:
 - “Technical Guidelines”;
 - “Training and Workshops”;
 - “Technical Expertise”;
 - “Enhanced International Regulatory Framework”; and
 - “Policy guidelines”.

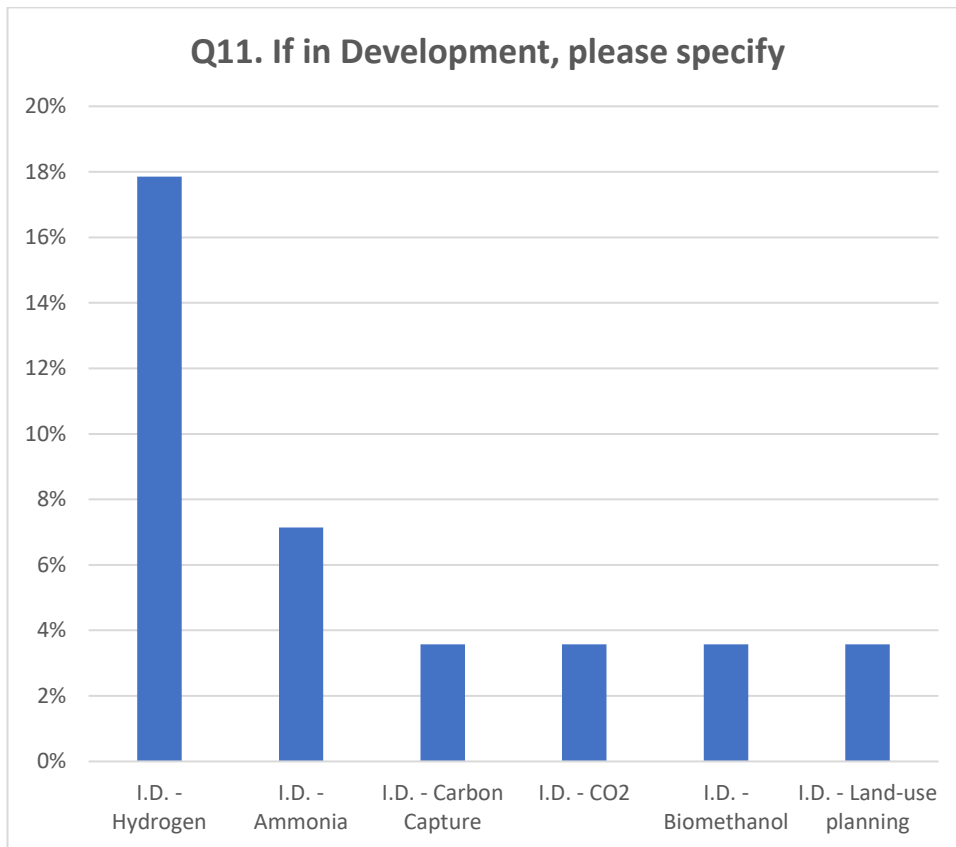
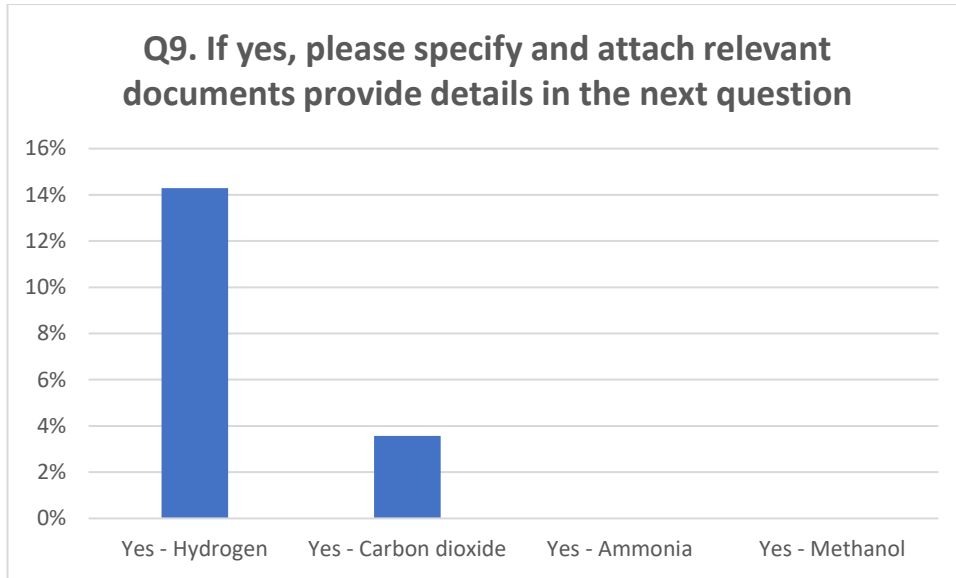
12. The Conference of the Parties is invited to consider the findings of the member State “ISET Survey” which will be presented at the seminar on the *Global energy transition: Strengthening industrial safety to address emerging risks* (see the seminar concept note, ECE/CP.TEIA/2024/INF.1) and for its decision-making on future work on this subject under the Convention's auspices (see draft decision contained in ECE/CP.TEIA/2024/3).

Annex

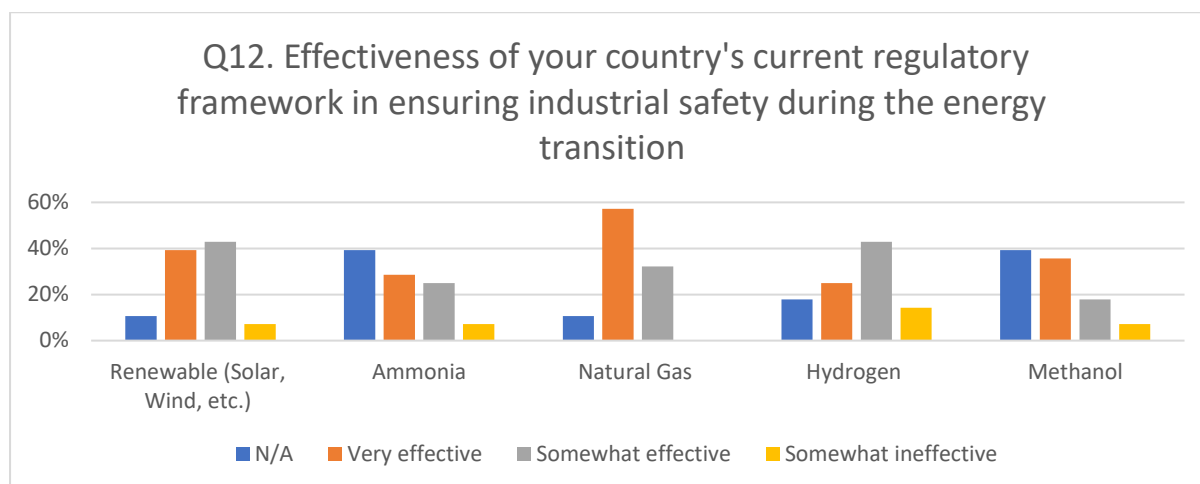
I. Energy Transition Challenges







II. Regulatory and Policy Framework

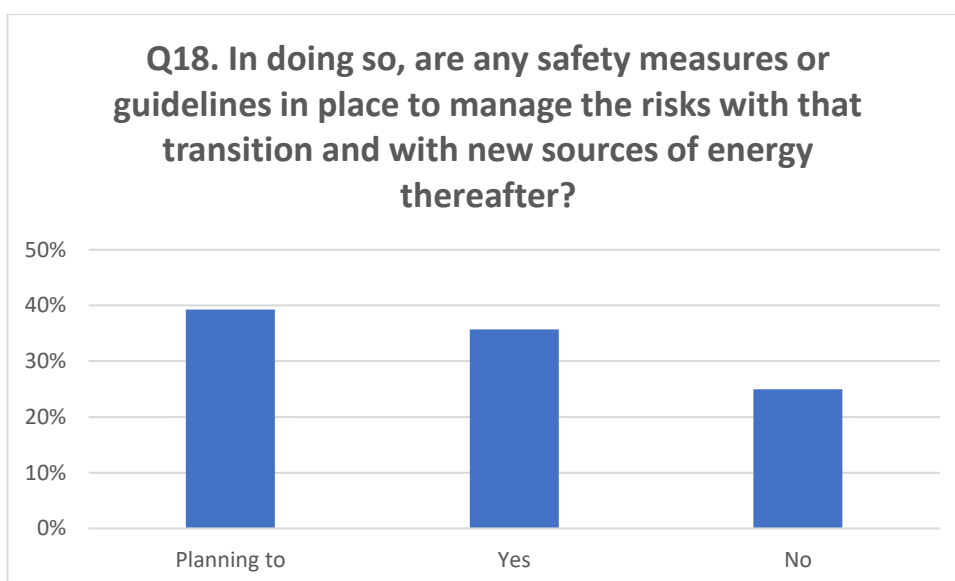
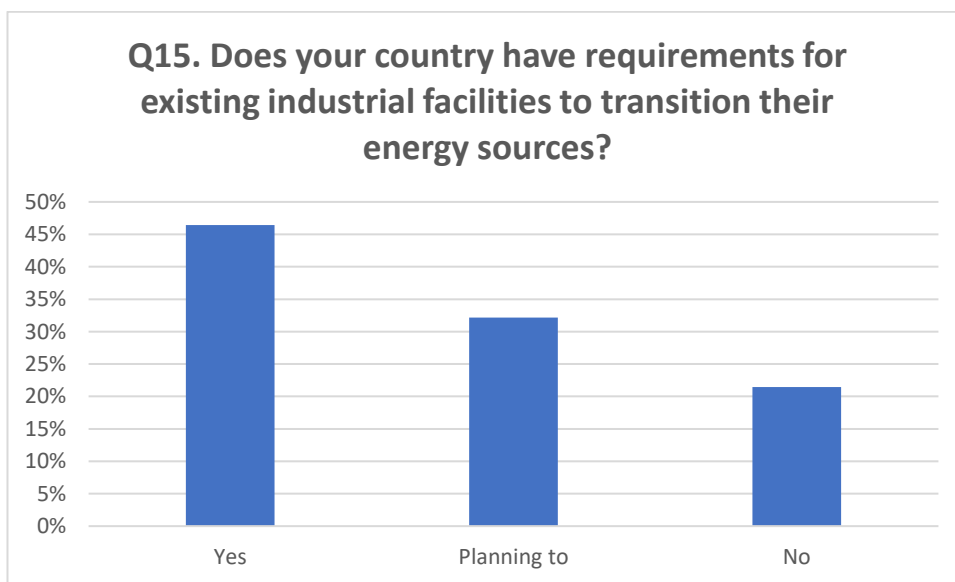


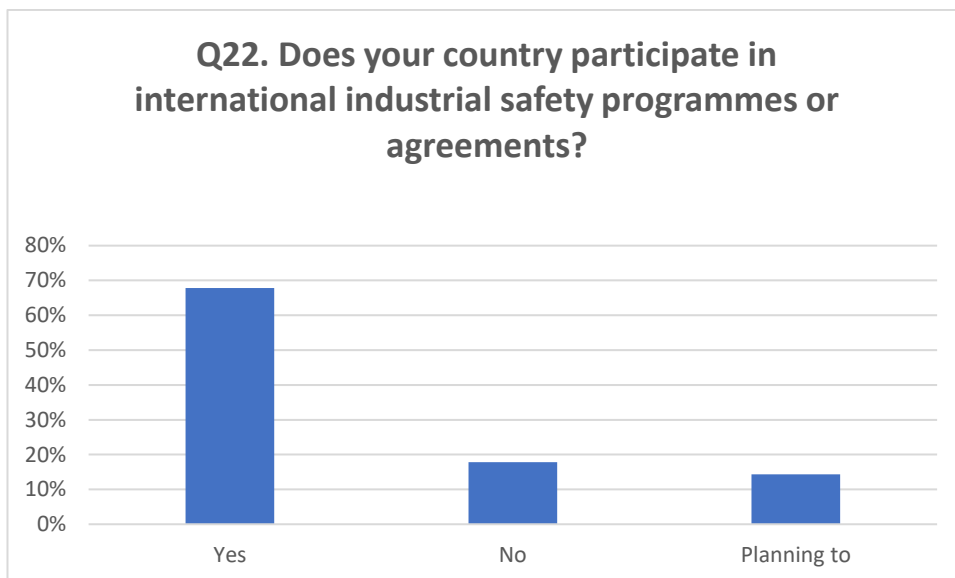
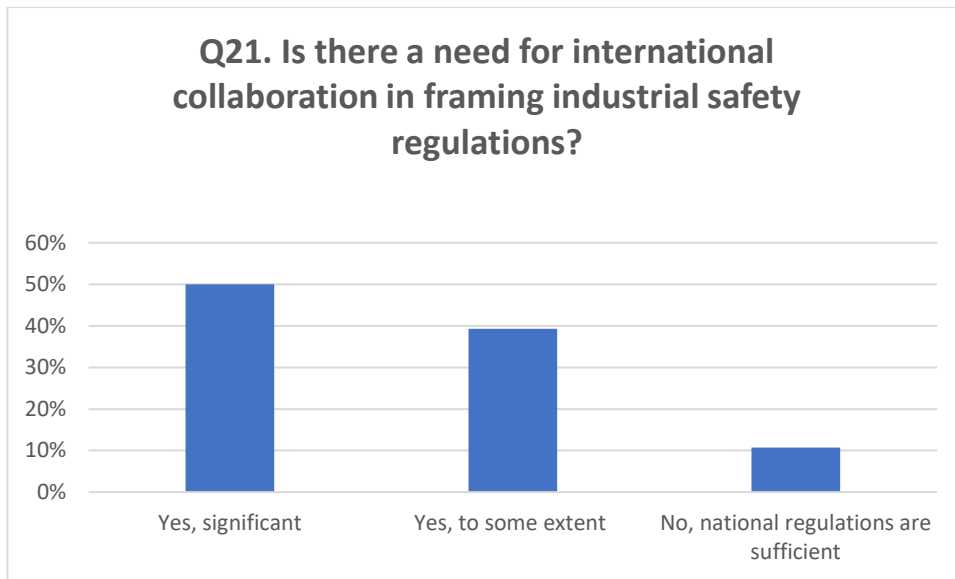
Q14. Please list the national authority(ies) primarily responsible for energy transition regulations and policies in your country. Please also specify if your authority coordinates or has plans to coordinate with them to ensure industrial safety in their implementation and monitoring of these:...

Armenia	The Ministry of Territorial Administration and Infrastructures is the primary responsible authority in this sphere. The Ministry of Internal Affairs cooperates with all other governmental bodies including the MTAI, and all activities in this sphere are regulated through the National Strategy for Disaster Risk Management as well as the Law on Civil Protection and Disaster Risk Reduction (the new draft of this law is in circulation, for improvements for the DRM sphere).
Austria	Ministry of Environment responsible for energy transition, energy efficiency, crisis management, Studies on renewable energies and responsible for sub-areas of industrial safety Ministry of Finance responsible for CCS, Underground storage facilities H2, introduction of substances into geological structures Ministry of Labour and Economy responsible for Studies on renewable energies and responsible for sub-areas of industrial safety
Belarus	Ministry of Energy of the Republic of Belarus Ministry for Emergencies of the Republic of Belarus
Belgium_Flanders	Most are regulated by the regions. For example Flanders in Belgium
Bulgaria	Energy Transition Commission to the Advisory Council for the European Green Deal to the Council of Ministers (ETC): Council of Ministers, Ministry of energy, Ministry of environment and water, Agency for sustainable energy development, Energy and Water Regulatory Commission and representatives of interested parties (40). In addition Ministry of innovation and growth, Ministry of the Interior (Directorate General "Fire Safety and Civil Protection") and others.
Cyprus	Ministry of Energy, Commerce and Industry
France	Ministry of environment
Luxembourg	In Luxembourg the directorate general for energy of the Ministry of the Economy is responsible for energy transition regulations. The Ministry of Labour and the Ministry of the Environment, Climate and Biodiversity are responsible for the implementation of the industrial safety regulations.
MONACO	Government

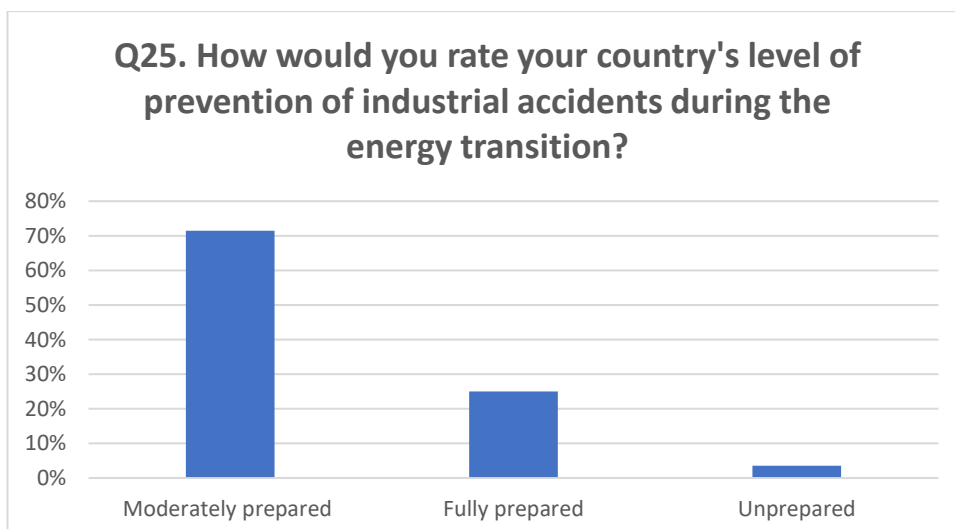
Montenegro	Ministry of Energy and Mining ministry of Interior Ministry of Tourism, Ecology, Sustainable Development and Northern Region Development
North Macedonia	Ministry of Economy is national authority for policies regarding energy sector. There is close cooperation between Ministry of Economy and Ministry of Environment and Physical .
Norway	The Norwegian Directorate for Civil Protection is responsible for the safety regulations concerning the green energy transition onshore with regards to fire and explosion and civil protection. Other authorities with responsibilities are the Environmental Agency, the Labour Inspection Authority and the Ocean Industry Authority.
Poland	Ministry of Climate and Environment
Portugal	Direção-Geral de Energia e Geologia, Agência Portuguesa do Ambiente
Romania	Ministry of Energy / ANRE / MMAP / ANRM / MEAT
Serbia	<p>The Republic of Serbia has prepared an Integrated National Energy and Climate Plan (INECP) for the period until 2030 in response to the Recommendation of the Ministerial Council of Energy community (2018/1/ MC-EnC) on preparation for the development of the Integrated National Energy and Climate Plan of the contracting parties of the Energy Community and the relevant strategic guidelines of the Secretariat Energy Communities (PG 03/2018). The structure and content of INECP is prescribed by the EU Management Regulation 2018/1999.</p> <p>An integrated energy and climate plan together with a corresponding Strategic Assessment Plan</p> <p>INECP's Environmental Impact Assessment is a key instrument for reducing gas emissions greenhouses in the Republic of Serbia. Also, the project will improve the process of strategic planning in energy sector in the country, introducing EU policies for climate change mitigation and protection of environment, in the context of the country's EU accession process and obligations towards the Secretariat of Energy community.</p> <p>The Government of the Republic of Serbia is the national body competent for adoption of INECP for a period of up to ten years, in accordance with the Law on energy, while the Ministry of Mining and Energy is the line ministry for the preparation of INECP in cooperation with other relevant ministries.</p>
Slovakia	Ministry of economy of the Slovak Republic in cooperation with the Ministry of the Environment of the Slovak Republic and other state administration bodies.
Sweden	Swedish Civil Contingencies Agency Swedish Environmental Protection Agency Swedish Work Environment Authority Safe and Interference-free electricity County Administrative Boards (regional authorities)
Switzerland	The national authority responsible for the energy transition is the Swiss federal office of Energy. The national authority responsible for the safety of installations for energy transition that exceed the threshold quantities for dangerous substances is the Swiss Federal Office for the environment.

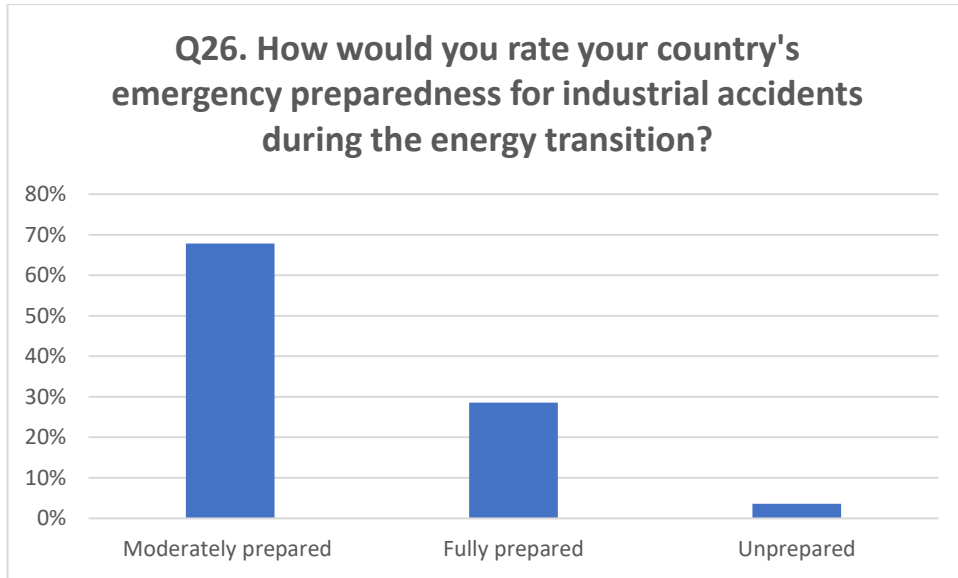
Ukraine	The Cabinet of Ministers of Ukraine coordinates the activities of executive authorities. Basic issues of energy transition: Ministry of Energy of Ukraine, State Emergency Service of Ukraine, Ministry of Environmental Protection and Natural Resources of Ukraine, Ministry of Economy of Ukraine, Ministry of Agrarian Policy and Food of Ukraine, Ministry of Development of Communities, Territories and Infrastructure of Ukraine, State Agency for Energy Efficiency and Energy Saving of Ukraine, State Service of Ukraine on Labor Issues, State Environmental Inspection of Ukraine
United Kingdom	Health and Safety Executive, Environment Agency (and Scottish and Welsh Environment Regulators). HSE works regularly with these agencies as part of a competent authority.
Uzbekistan	Ministry of Emergency Situations, Ministry of Mining and Geology, Ministry of Water Resources



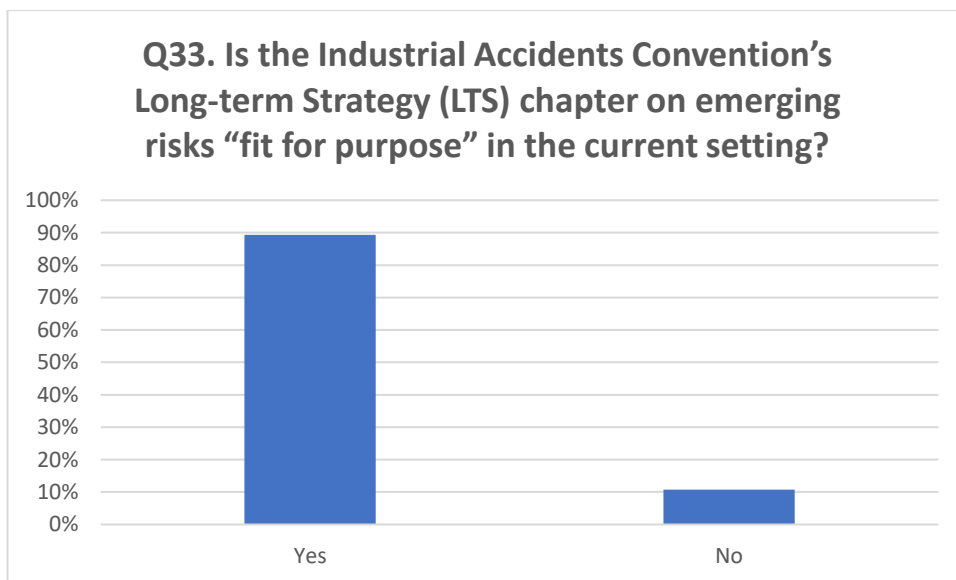
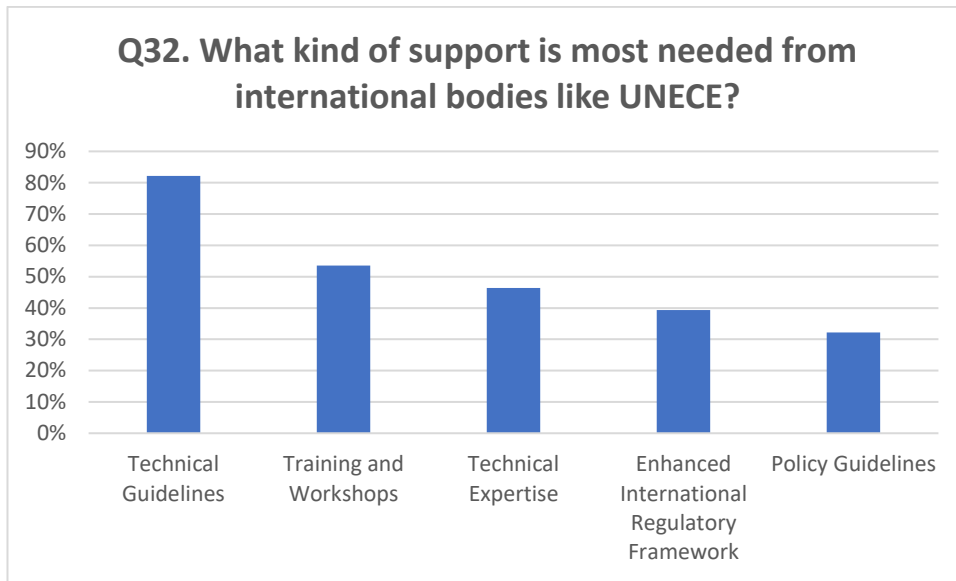


III. Risk Management and Emergency Preparedness





IV. Future Outlook and Support



- Q35. Should other parts of the LTS be updated and adapted? Please specify**
- We could explicitly mention the hazardous substances used for the energy transition
 - More specific guidelines are needed
 - Yes, more practice-based and with a commitment and sponsoring those nations willing to share knowledge. For lots of high-tech countries, this is not covered by national authorities, but regional authorities.

Q36. What are your long-term goals in the area of industrial safety amid the energy transition?



Q37. A half-day seminar on the nexus of energy transition and industrial safety is planned to be organized back-to-back with the Conference of the Parties to the Industrial Accidents Convention on 27-29 November 2024. What topics would you suggest covering in the agenda of the seminar?

- Hazard and risk studies developed so far.
- Case studies of such installations and how the hazard and risk has been evaluated.
- Carbon Capture and storage, Hydrogen
- Safety considerations in energy transition
- Risk of carbon capturing. Liquid carbon dioxide? Bunkering hydrogen (ship to ship transfer hydrogen). Liquid hydrogen storage. From RPV tanks (ship technology) going towards Refrigerated Pressure Vessels on dry land (large systems, with unknown failure rates)
- Interfaces with the Seveso directive, pipelines and transport of dangerous goods
- Hydrogen, land use planning, ammonia
- Provide an overview of the concepts of energy transition and industrial safety, including their importance, goals, and challenges.
- examine best practices and case studies highlighting successful integration of renewable energy sources in industrial facilities to improve energy efficiency and reduce environmental impact while maintaining safety standards.
- Exchange of best practices
- Hydrogen storage and conversion to ammonia
- Technological tools for enhancing Industrial Safety by energy transition
- Overview of how advanced the different technologies are in the countries.
- Overview of safety standards, that have been developed specifically for hazardous substances and installations in connection with energy transition.
- Exchange of good practices in the area of energy transition regarding hazard and risk assessment methodologies for the different chemical hazard potentials and technologies.
- Outlook, which safety standards, hazard and risk assessment guidelines are under development or will be developed in the future.
- Topics
 1. What are the main challenges for competent authorities today?
 2. Summary of available technical or policy guidance documents
 3. Environmental challenges due to the development of new technologies

4. Challenges for fire-fighting brigades (especially in the case of batteries)

- Main stages of energy transition. Best practices of partner countries
- Best practices in implementing energy transition into industrial sites with major-accident hazards involving dangerous substances
- Risk of chemical accidents from the energy transition: risk from hydrogen, ammonia, lithium-ion batteries, solar power and carbon capture utilisation and storage (CCUS).

Q38. Would you have any other comments that you wish to recommend to the Group on the Industrial Safety of the Energy Transition?

- Expertise should be collected and presented from more advanced countries
- The work is comprehensive enough so far
- Highlight the significance of effective risk communication in promoting industrial safety throughout the energy transition. Encourage transparent and proactive communication with stakeholders, including employees, local communities, regulators, and investors, to build trust, manage expectations, and facilitate informed decision-making.
- Sharing the experience and involving stakeholders