



REPUBLIC OF ESTONIA
MINISTRY OF EDUCATION
AND RESEARCH

Research and Innovation for Clean Energy – Estonian strategic view

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Topics to be covered

Estonian RDIE strategy 2021-2035

RDIE focus areas and roadmaps

Smart and sustainable energy solutions as one of the focus areas for RDI

Estonian nuclear energy working group activities

RDIE 2035 objectives

GENERAL OBJECTIVE

Estonian research, development, innovation and entrepreneurship work together to increase the well-being of Estonian society and the productivity of the Estonian economy, by providing competitive and sustainable solutions for the development needs of Estonia and the world.

RDIE LINES OF ACTION AND SUB-OBJECTIVES



RESEARCH SYSTEM

Research in Estonia is high-level, effective and diverse



KNOWLEDGE TRANSFER

Estonia's development relies on research-based and innovative solutions



BUSINESS ENVIRONMENT

Estonia's business environment encourages entrepreneurship and the emergence and growth of knowledge-intensive enterprises, the creation and export of higher value-added products and services, and investments in all regions of Estonia

R D I E Strategy 2035 – joint strategy of two Ministries

More holistic and coherent approach to national innovation system and its governance

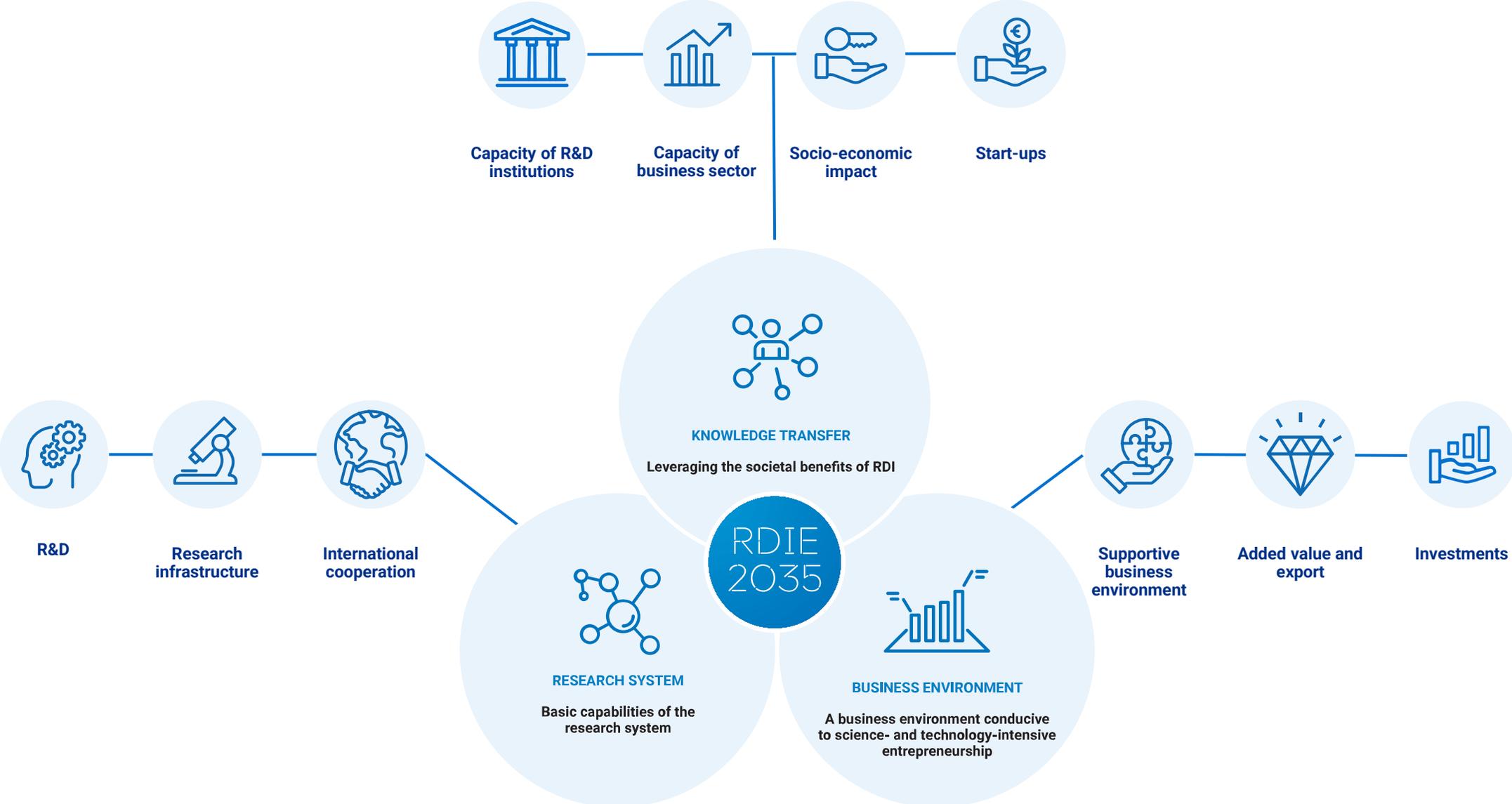
- Increased cooperation and coordination in policy design and implementation
- Cooperation between the business sector and academia

Increasing the societal and economic impact of R&D

- Contributing for solving the societal needs
- Knowledge-intensive productivity growth, focus on technologic innovation
- Increasing the knowledge transfer skills and capabilities of private sector, research institutions as well as public sector

Developing the innovation-friendly business environment and supporting the knowledge intensive entrepreneurship

Three axes of RDIE Strategy and directions of action



Special focus on synergy and knowledge transfer

- Societal and economic impact of RDI
- Knowledge transfer capacities of RD institutions and of business sector – cooperation and synergy
- One of the starting points of the Estonian RDIE Strategy is the need to make smart choices and to **concentrate activities and funding** on the areas that can best contribute to creating solutions to society's challenges, based on research results and cooperation between different actors. To this end, the Strategy identifies **areas for priority development** and increased public support.
- **RDIE focus areas:** knowledge-based economic and societal development enhanced in cooperation

RDIE Strategy 2035

RDIE focus areas



Digital solutions across all walks of life

- Digital solutions across all walks of life
- Tapping into the data economy to create new business opportunities
- Secure cyberspace



Health technologies and services

- More effective and accessible health services
- More patient-centred and evidence-based treatment and prevention; personalised health services
- Export potential of healthcare



Valorisation of local resources

- Valorising resources in a sustainable, biodiversity-friendly and resource-efficient way, taking into account both primary and secondary raw materials and leveraging the bio- and circular economy
 - *Food*
 - *Timber*
 - *Mineral resources*
 - *Secondary raw materials and waste*



Smart and sustainable energy solutions

- Production of energy in a climate-neutral way
- More efficient and resource-saving use of energy
- Security of energy supply



Viable Estonian society, language and cultural space

- Evolving nation, language and cultural space
- People-centred and knowledge-based governance
- Knowledge, skills and attitudes of people
- People-centred and socio-culturally sensitive economy and technology
 - *Language and culture.*
 - *Education*
 - *Societal processes*

Roadmaps of the RDIE focus areas

- Roadmaps – triple (business sector, academia, government) agreement on the goals, RDI directions and key actions for the focus areas
- Preparations started in 2021, roadmaps approved by the strategic committee of RDIE and endorsed by two ministers (MoER, MoEC) in November 2022
- Roadmaps give a straight input to the design of the financial measures (especially the new period of EU structural funds)
- Renewal of roadmaps in every 3-4 years



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RDIE focus area
**Smart and
sustainable
energy solutions**

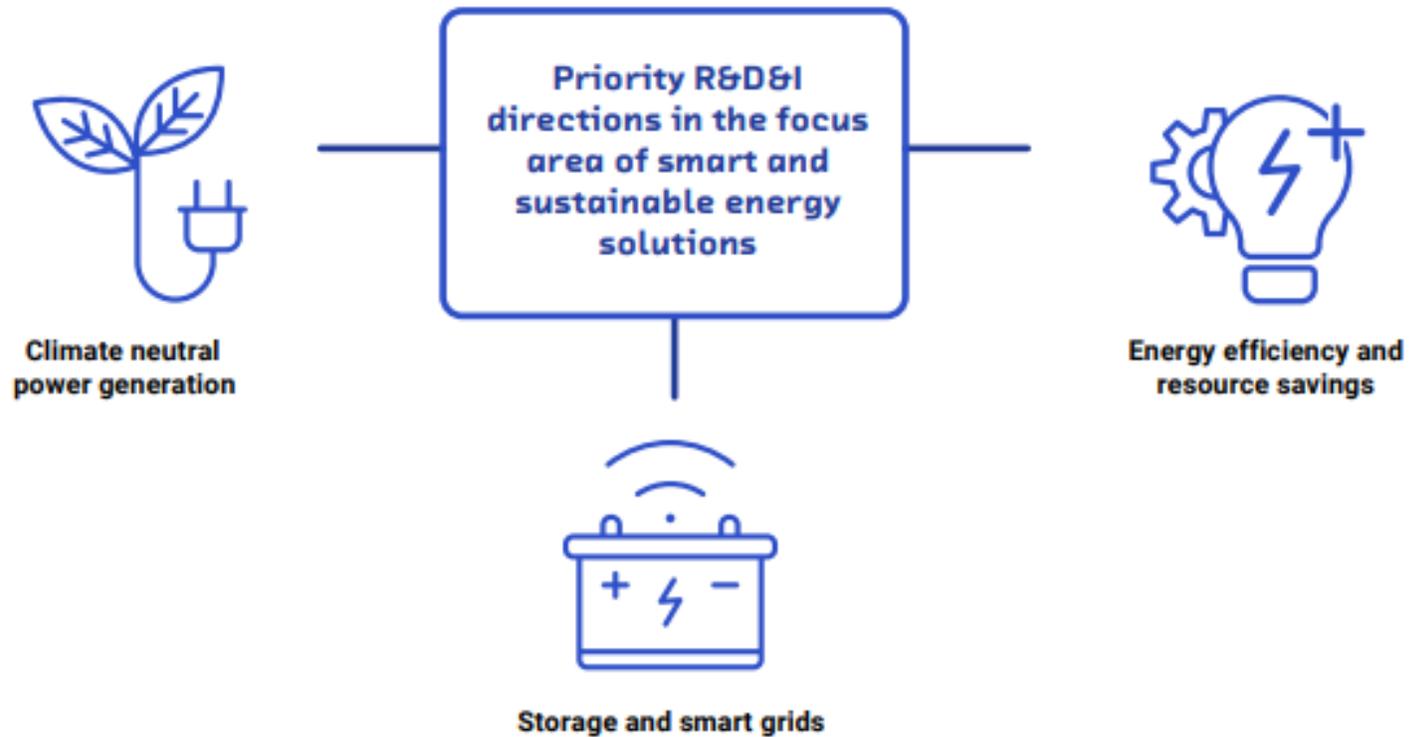


Smart and sustainable energy solutions

The aim is to develop, in partnership between research and business, research-based solutions for the environmentally sound, sustainable, efficient and secure production, storage, and use of energy

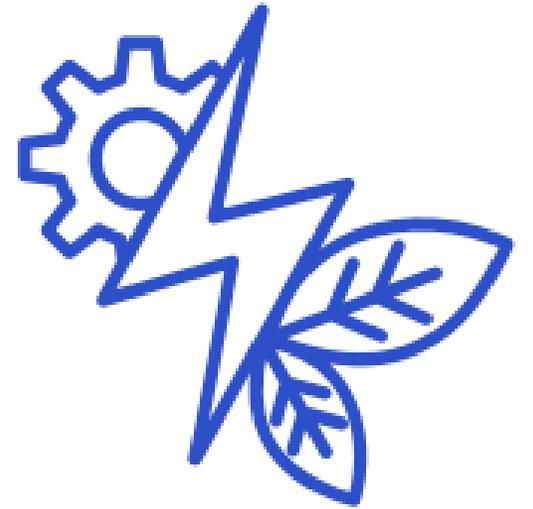


Smart and sustainable energy solutions: priority RDI directions

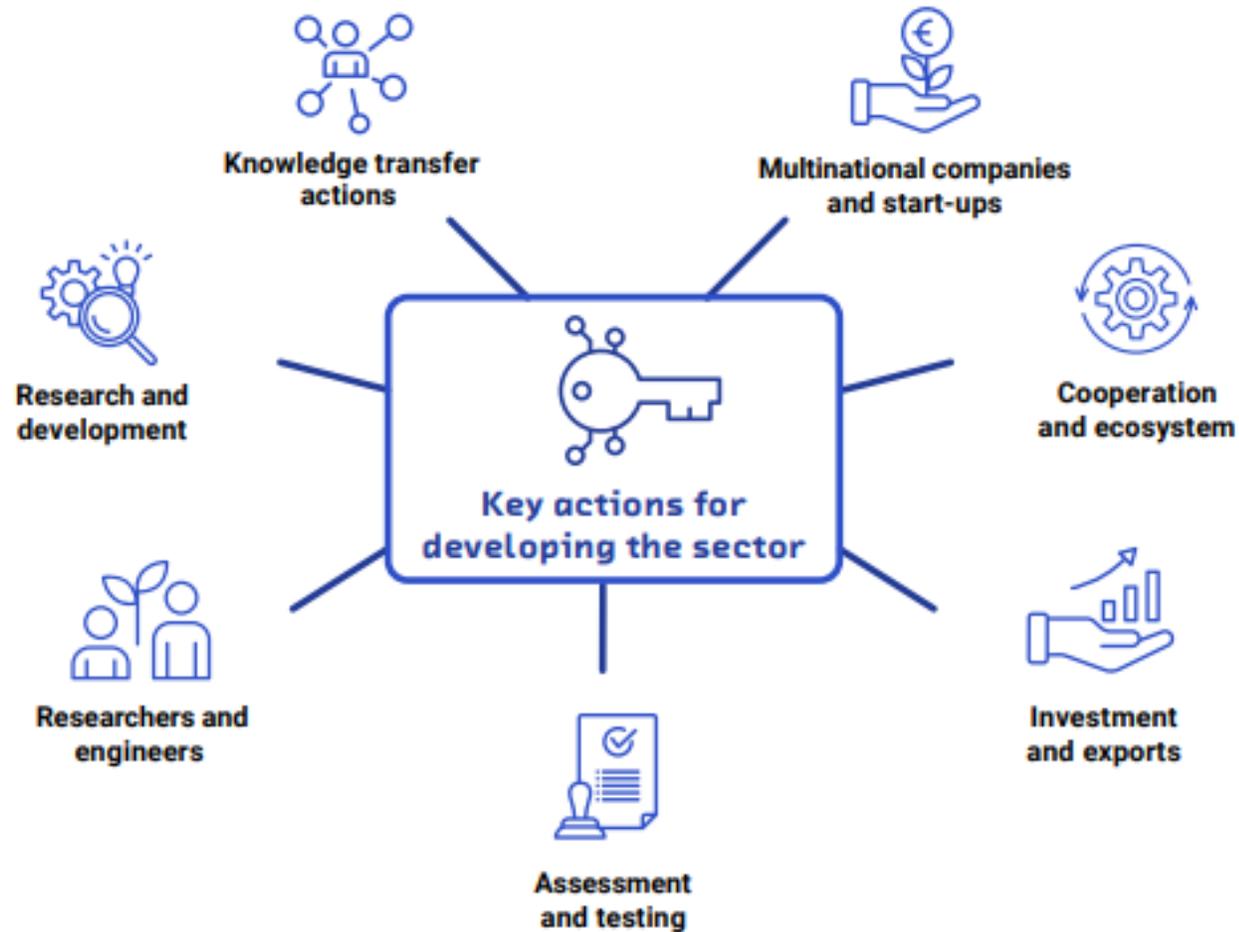


Smart and sustainable energy solutions: priority RDI directions

- Climate neutral energy production (e.g. wind, solar and other energy solutions, biofuels)
- Energy storage, load management and transmission (e.g. smart grids, batteries)
- Energy consumption solutions to improve energy efficiency and sustainability (e.g. for transport and building sectors)

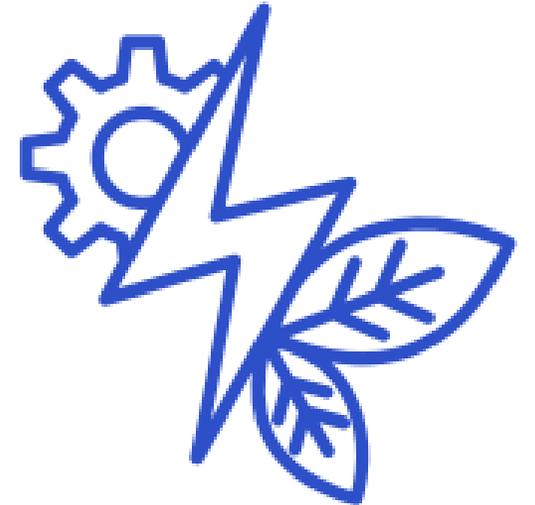


Smart and sustainable energy solutions: key actions for RDIE



Smart and sustainable energy solutions: key actions for RDIE

- Knowledge transfer actions: basic and applied research, joint activities involving business sector and researchers, R&D services, international cooperation, etc
- Developing the capabilities and environments for evaluating and testing the solutions
- Ensuring researchers and engineers in the area
- Fostering broader cooperation between research institutions, business sector, the public sector and other partners (ecosystem approach)
- Boosting the emergence and growth of start-ups and spin-offs in the sector
- Supporting investment and exports



Nuclear Energy Working Group (WG)

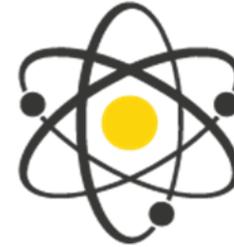
- In 2019, private company Fermi Energia initiated a debate on potential use of Small Modular Reactors in Estonia.
- WG was established with a Government's mandate by the Ministry of the Environment on **20th of April 2021**.
- Information on WG activities and protocols of the meetings are publicly available: <https://envir.ee/kliima-ja-keskkonnakaitse/kiirgus/tuumaenergia-tooruhm>



WG Members

Members of the working group are high level representatives (Secretary General, Deputy Secretary General, Head of Department) of following ministries and authorities:

1. Ministry of the Environment
2. Ministry of Finance
3. Ministry of Justice
4. Ministry of Economic Affairs and Communications
5. Ministry of Social Affairs
6. Ministry of Education and Research
7. Ministry of Foreign Affairs
8. Ministry of the Interior
9. Ministry of Defence
10. Environmental Board
11. Consumer Protection and Technical Regulatory Authority
12. Republic of Estonia Government Office



TUUMAENERGIA
TÖÖRÜHM

Chair of the WG: Secretary General of the Ministry of the Environment, Mr. Meelis Münt

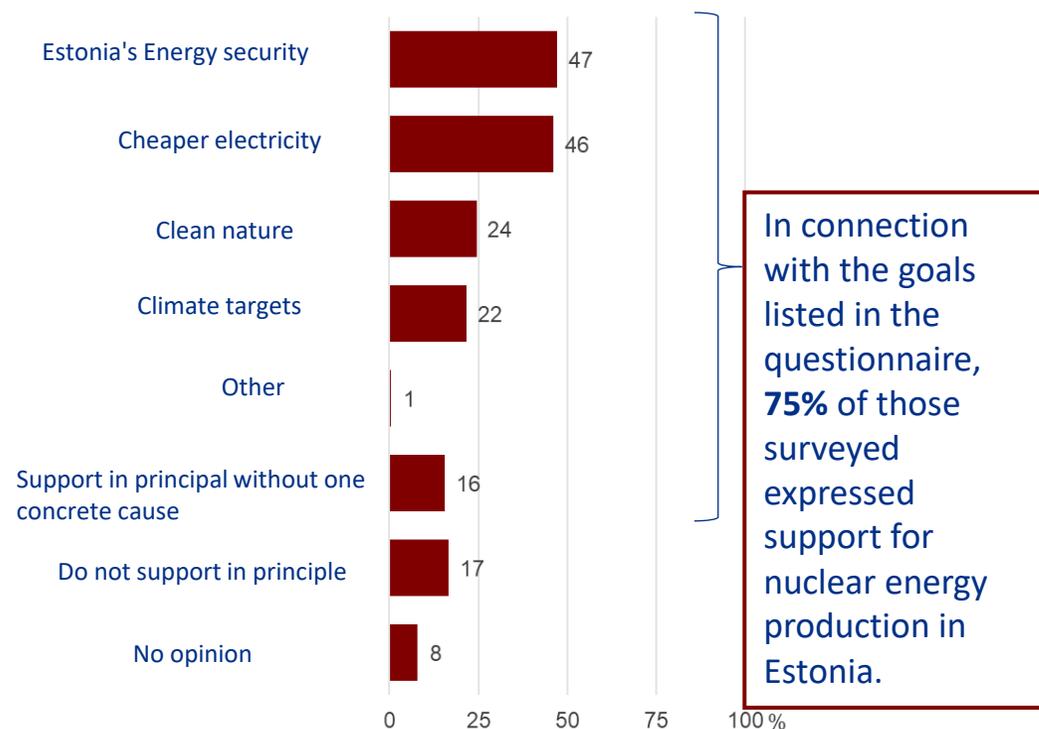
Analyses, strategies and surveys

- Preliminary site selection survey for the nuclear power plant and final disposal facility for spent nuclear fuel (March 2023).
- Nuclear security analysis and emergency preparedness (December 2022).
- Expert analysis of the Finnish nuclear regulator STUK for the WG interim report (November 2022).
- Public surveys on Nuclear Energy awareness and support (February 2022, February 2023, April 2023, November 2023)
- Development of a communication strategy (November 2022).
- Human resources development strategy for the WG and mapping of the regulatory framework (March 2023).
- Mapping of the legal framework and updating the draft nuclear law - (March 2023, June 2023)

Support to Nuclear Energy production in Estonia, February 2023

Do you support the production of nuclear energy in Estonia (construction of a nuclear power plant) and for what purposes?

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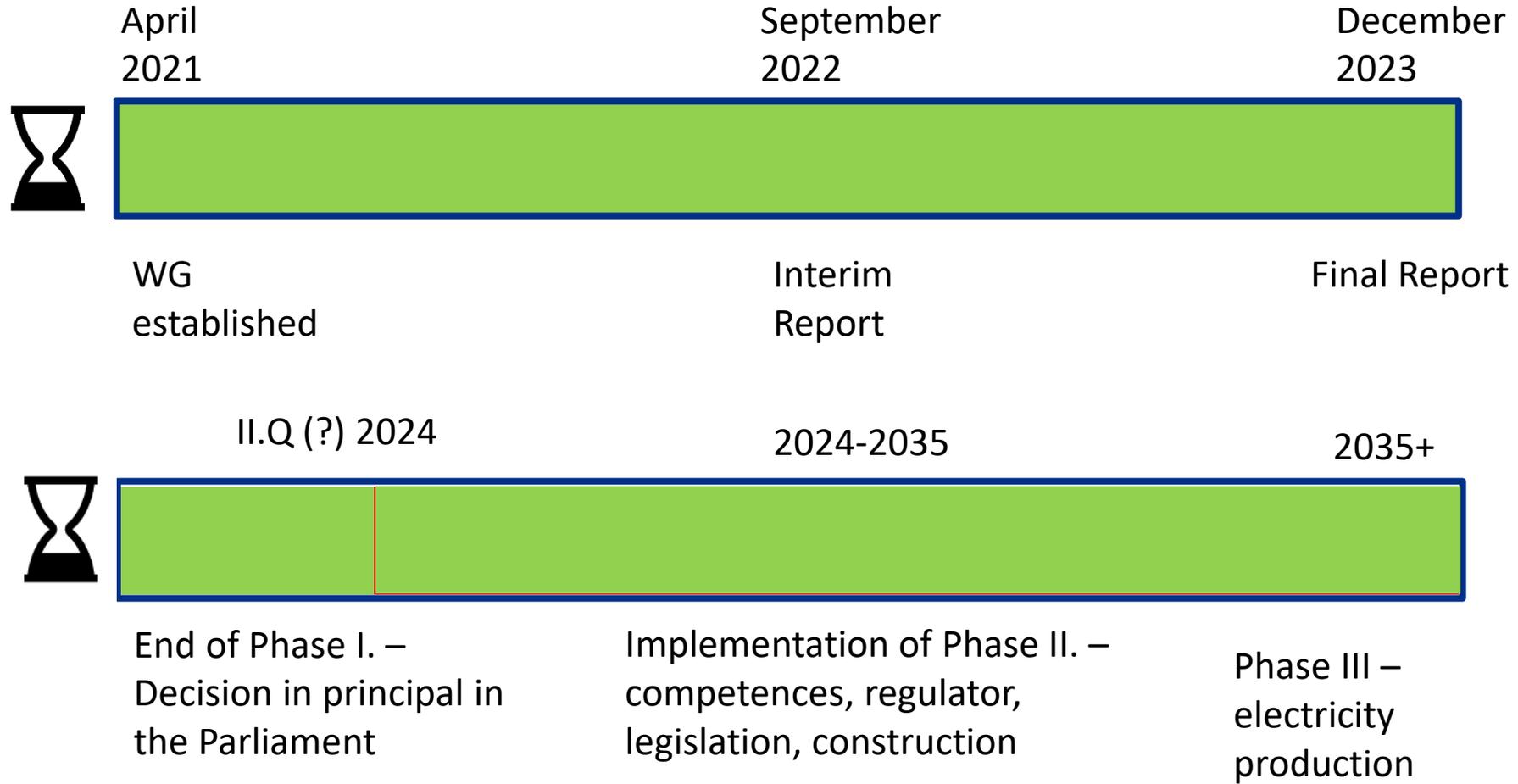
Tasks of the WG

- The WG presents its interim report to the Government at the end of **September 2022**.
- Interim report is a mapping of the current situation in Estonia (regulatory framework, human resources) and provides an overview of the necessary activities that are necessary for the introduction of nuclear energy.
- **Final comprehensive report is due in December 2023.**
- The final report is going to formulate recommendations whether or under what conditions nuclear power plant could be built in Estonia.
- WG report shall be based on the International Atomic Energy Agency (IAEA) guidance Document „Milestones in the Development of a National Infrastructure for Nuclear Power“ (https://www-pub.iaea.org/MTCD/Publications/PDF/Pub1704_web.pdf)

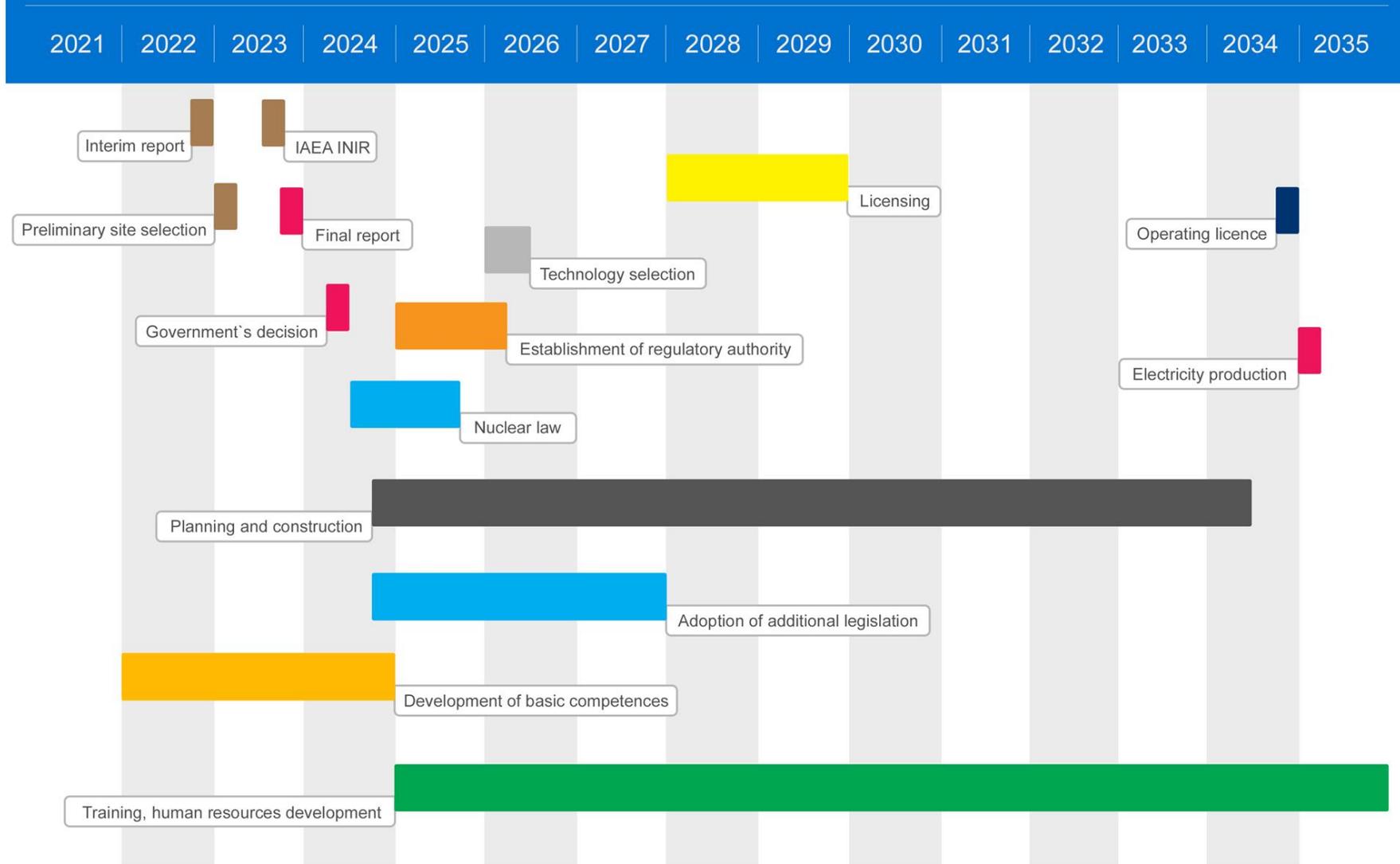
19 nuclear infrastructure issues to be covered in the WG's final report



Nuclear Power Programme timeline



Nuclear programme implementation timeline



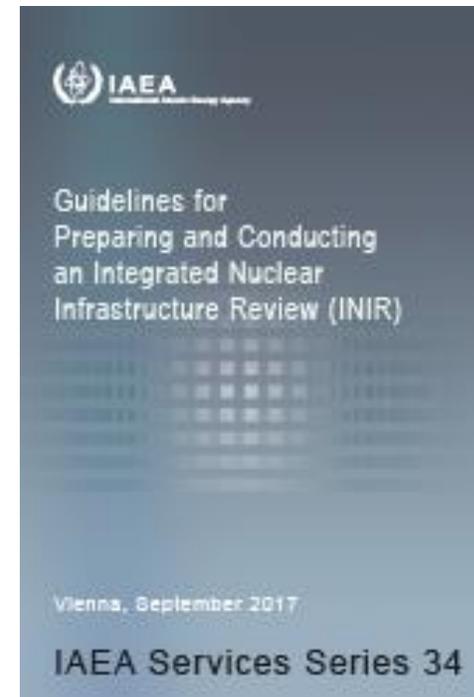
Analyses and activities planned for 2023

- Analysis on radioactive waste management (Breitenstein-Solutions, June 2023)
- Safeguards analysis (Proxion Plan OY, June 2023)
- Radiation protection (**STUK**, July 2023)
- Validation of Fermi Energia analyses on supply chain, financing, procurement, nuclear fuel cycle etc (August 2023).
- Nuclear Energy seminar for the members of the public (November 2023)
- Implementation of communication plan and capacity building activities

IAEA INIR mission preparations:

- Preliminary self evaluation report (SER) – April 2023
- Pre-INIR mission – 6-8 June, 2023
- Final SER – August 2023
- INIR-1 mission – 23-31 October, 2023

NB! Estonia is the first country to host INIR-1 mission for SMR's!



International cooperation

- IAEA - Division of Nuclear Power, Nuclear infrastructure Development section, Department of Technical Cooperation, Division for Europe.
- STUK (Finnish Radiation and Nuclear Safety Authority) – consultations and interim report review services.
- USA – FIRST Program (coordinated by Department of State) for nuclear capacity building.
- Canada – MoU between Canadian Nuclear Safety Commission and Estonian Environmental Board
- France, Japan, Germany - negotiations on potential cooperation, technical visits





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Thank you!