

# Presentation of the Strategic Research Agenda



**ETIP-DG**

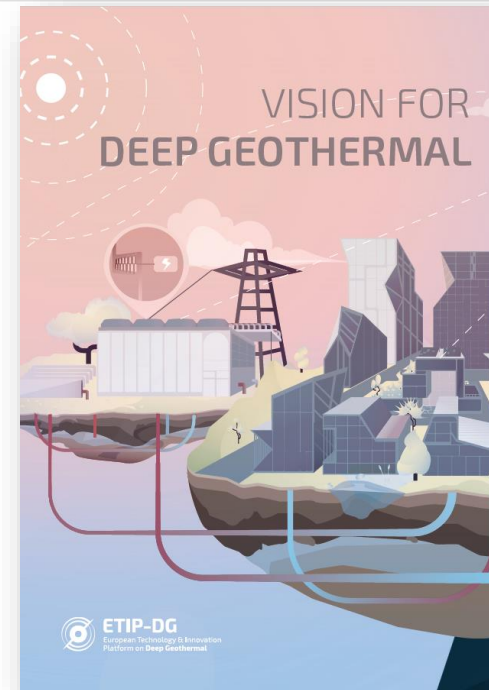
European Technology & Innovation  
Platform on **Deep Geothermal**

[www.etip-dg.eu](http://www.etip-dg.eu)



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# Primary objectives of ETIP-DG

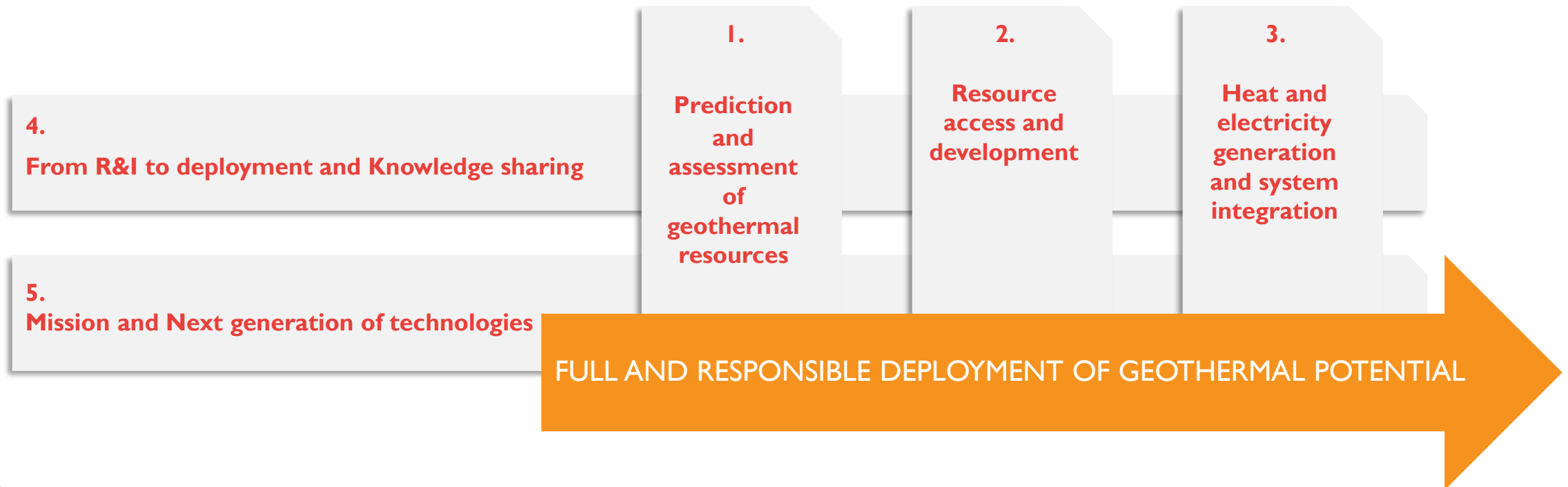




# Novel technologies for full and responsible deployment of geothermal potential

> Technologies beyond H2020

> While targeting the EU long-term goal of **reducing costs** and **increase performance** of geothermal technologies and installations, RD&I pursue all opportunities for complete deployment of geothermal resources, aiming at various advancements





# Chapter A: Prediction and assessment of geothermal resources

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Topic 1. Improved exploration prior to drill

Topic 2. Advanced investigation and monitoring technology

Topic 3. Exploration workflows - Conceptual models, reservoir characterization, performance and decision models

Topic 4. Exploration catalogues – reservoir analogues, rock properties and model constraints

Topic 5. Resource potential assessment

Topic 6. Beyond Conventional Resources



## Chapter B: Resource Access and Development

# Chapter B: Resource Access and Development (Part 1)

Topic 1. Towards robot drilling technologies

Topic 2. Fast rate of penetration technologies

Topic 3. Green drilling fluids

Topic 4. Reliable materials for casing and cementing

Topic 5. Monitoring & logging while drilling (incl. looking ahead of the bit)

Topic 6. High Temperature-electronics for geothermal wells



# Chapter B: Resource Access and Development (Part 2)

Topic 7. Effective and Safe technologies for enhancing energy extraction

Topic 8. Total re-injection and greener power plants

Topic 9. Optimized, monitoring and controlling corrosion and scaling

Topic 10. Efficient resource development

Topic 11. Enhanced production pumps



# Chapter C: Heat and electricity generation and system integration

# Chapter C: Heat and electricity generation and system integration (part 1)

Topic 1. Advanced Binary plants

Topic 2. High temperature binary power plants

Topic 3. Power cycles and mitigation for super high enthalpy resources, high enthalpy steam direct expansion

Topic 4. Flexible production of heat and power

Topic 5. High Temperature Thermal Energy Storage (HT-TES)

# Chapter C: Heat and electricity generation and system integration (part 2)

Topic 6. Innovative design and integration of binary cycle technology in existing and new flash plants

Topic 7. Develop Hybrid plants

Topic 8. Exploit Mineral production from geothermal sources

Topic 10. Generation with different voltage for smart grids



## Chapter D: From RD&I to deployment

# Chapter D: From RD&I to deployment (Part 1)

Topic 1. Set the right Policies

Topic 2. Public and other stakeholders' engagement

Topic 3. Reinforce Competitiveness

Topic 4. Establish Financial Risk management Management schemes

Topic 5. Support schemes to deploy geothermal

Topic 6. Establish Legal and regulatory framework

# Chapter D. From RD&I to deployment (Part 2)

Topic 7. Embedding geothermal energy in the circular economy

Topic 8. Harmonised protocols for defining environmental and health impacts of geothermal energy and mitigation planning

Topic 9. Human deployment



## Chapter E: Knowledge sharing



# Chapter E: Knowledge sharing

Topic 1. Underground data sharing - unlocking existing subsurface information

Topic 2. Organization and sharing of geothermal information

Topic 3. Shared Research Infrastructures



# Chapter F: Mission

# Chapter G: Next Generation of technologies

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- a) Geothermal resource assessment through deep probing earth observation
- b) Geothermal Energy Buffers (GEB)
- c) Develop bio-inspired robots for revolutionary drilling: more efficient, less costly with automatization, safer, environmentally friendly
- d) Create an underground energy system
- e) Use of IT tools based on data mining and machine learning for resource assessment, access to the resource and generating energy
- f) Connecting the reservoir with the surface: reliable and resilient data transfer
- g) Produce energy from geothermal offshore installations



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