

Decarbonising cities with geothermal district heating and cooling, and how to finance it

De-risking and Financing the deployment of geothermal DH

GEORISK/Covenant of Mayors seminar
13 December 2019, Brussels

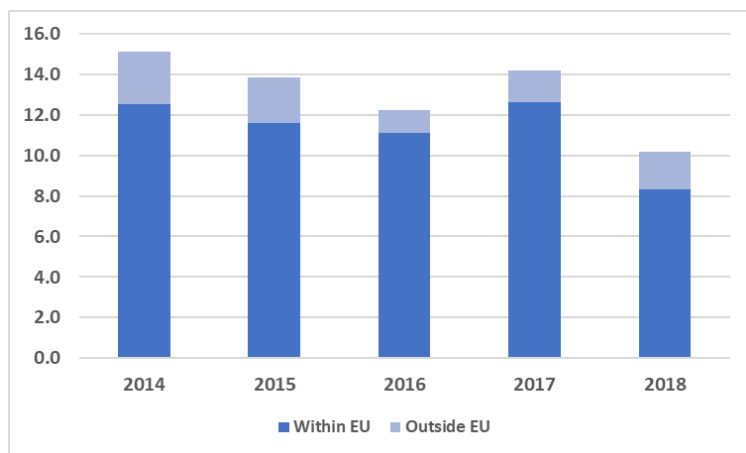
European Investment Bank – An overview

- ▶ EIB is based in Luxembourg and **owned by the 28 EU Member States**
- ▶ EIB is the **EU's long-term lending institution** – a public bank with objectives **driven by EU-policies** with priorities to promote European economic development and integration
- ▶ **4 key areas:** innovation, SME, infrastructure, climate/environment
- ▶ EIB's **financing activity** was **~56 bn EUR** in 2018, thereof 48 bn EUR within the EU
- ▶ EIB **finances itself** mainly **through bond issuance** on international capital markets
- ▶ **Core activities** include **lending, blending** and **advisory**

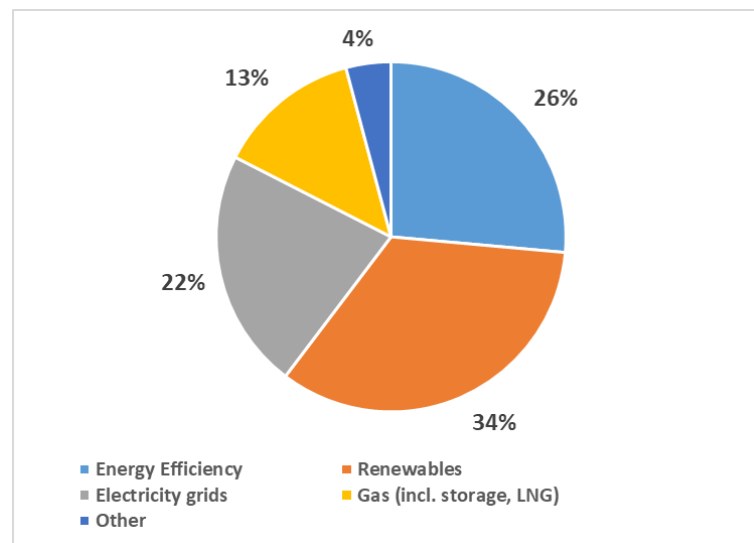


EIB lending to the energy sector

Overall Energy Signatures (EUR bn)



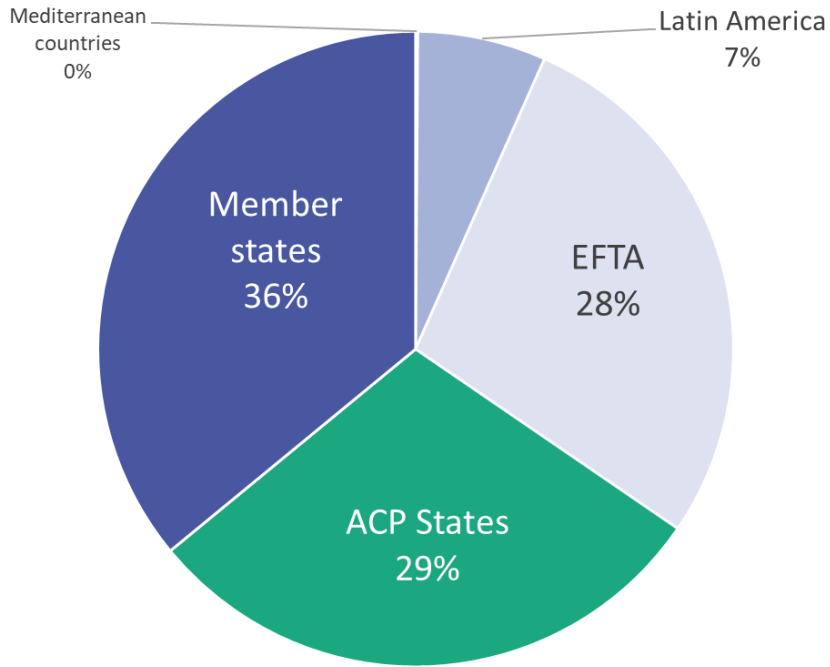
Breakdown by sectors (2014-2018)



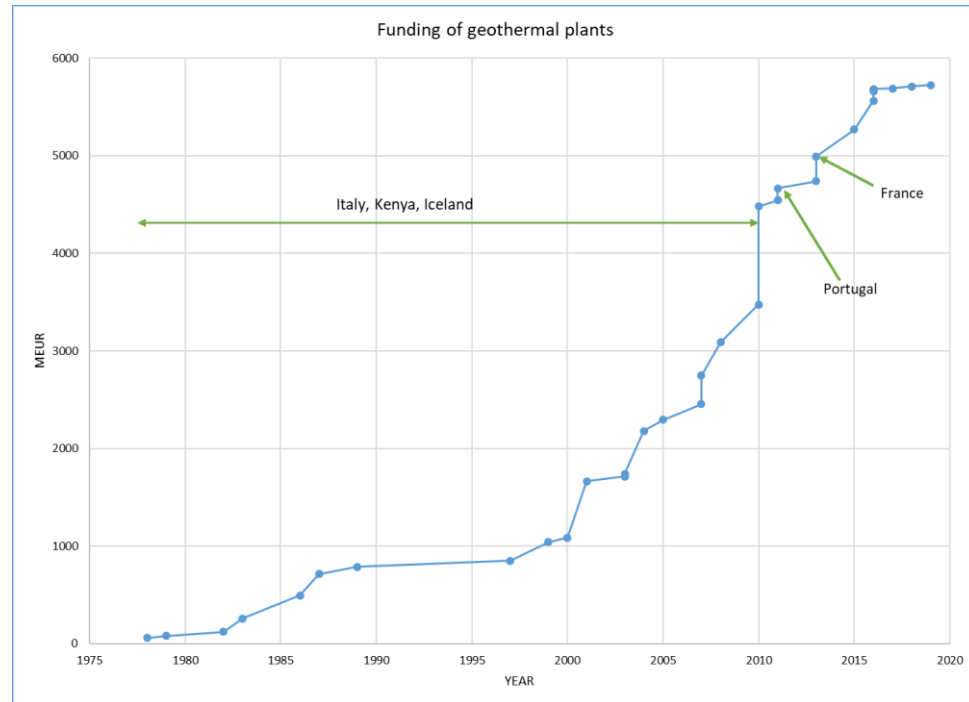
- EUR 13bn per year (2014-2018)
- Energy represented 18-20% of EIB lending
- c. 85% of energy lending inside EU

- Driven by EU energy policy
- Focus on RE, EE and networks
- Increase of EE over last years

EIB funding of Geothermal Projects



Total approx. 6 bn EUR



EIB Energy Lending Policy (ELP)

Main pillars of new ELP

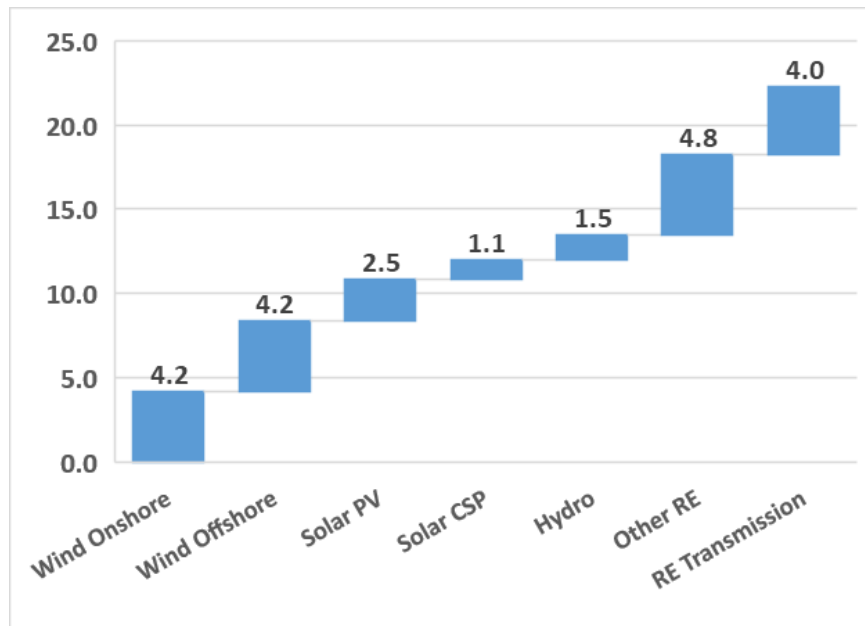
Drivers behind revision

- evolution of market, sectors and business model since previous policy (2013)
- the EC's Clean Energy for All 2030 package
- EIB Climate Strategy of 2015

- **Energy efficiency first principle** – focus on residential sector and building rehabilitation
- **Decarbonizing energy supply**– Renewable energies continue to be the core of EIB's lending with focus on market integration
- **Innovative technologies & business models** – EIB provides targeted support to innovative projects (small scale generation, DSM¹, storage, immature RE technologies)
- **Securing the enabling infrastructure** – Priority for PCI, electricity distribution networks, digital technologies and smart grids
- **Energy Transition Package (ETP)** – Increased focus on 10 Modernization Fund countries
- **Outside EU** – Support to meet Sustainable Development Goals, incl. scaling up renewables, energy efficiency and grids

ELP: Decarbonized Power and Heat

EIB Lending (2014-2018)



Priority areas

- ▶ **Renewable Energy** at the **core** of EIB's energy activities over the last 10 years
- ▶ Experience across all RE **technologies** including emerging and **innovative** ones
- ▶ Experience across all the EU Member States and in the various RE policy schemes (including CFDs, tenders etc)
- ▶ Support to **small scale RE applications**, heat generation from RE and low carbon CHPs
- ▶ Possibility to provide ad-hoc technical advice to projects and authorities
- ▶ Support to **innovative low carbon technologies** through specific financial products and technical advisory (Innovfin EDP)

EIB offers finance and technical/financial advisory



UPSTREAM

- **Policy & programme** advice
- **Preliminary** project assessment

PREPARATION

- **Technical advice** to promoters prior to appraisal (demand studies, business plan, CBA)
- Advice on **financial structuring** (PPPs, **investment platforms** & 'innovative' projects)
- Selection (ToR) & supervision of **consultants** for technical and financial studies to support project preparation

IMPLEMENTATION

- Advice on **project implementation**
- **Enhanced monitoring** in delayed projects

CAPACITY BUILDING RELATED TO PROJECTS

Capacity building on technical issues – **Cooperation** centres of expertise - **Dissemination** best practices & case studies – **Needs Assessment** for project advisory support

Brief overview of ELENA

- EC-EIB cooperation to support public and private bodies to **prepare their energy saving investment programmes** in order to reach EU 2020 and 2030 energy saving targets.
- **Grant for preparation** (not implementation) of investment programmes for energy efficiency measures, building integrated renewables, district heating and clean urban transport
- Funds are from the EU's Horizon 2020 Programme and are managed by the EIB
- Associated investments are estimated to be over EUR 5.8bn



What do ELENA beneficiaries receive?

- Technical Support
 - ELENA grant used to assist in project preparation (e.g external expertise, feasibility studies, energy audits etc)
 - Eligible activities for ELENA are those necessary to develop and mobilise finance for a clearly identified investment programme
- Financial Support
 - ELENA will fund up to 90% of the eligible preparation costs (with 10% provided by applicant)
- No calls, allocated on a first come, first served basis
- Applicants will receive support to prepare the ELENA application for EC approval



The Energy Demo Projects Facility

The EC and the EIB aim to bridge the funding gap for the scale-up of energy innovation and its successful commercial demonstration by:

- providing financing to **innovative energy demonstration projects**
- offering promoters, sponsors and/or operators the opportunity to leverage EIB's capability to evaluate and structure innovative projects
- making financial and technical assistance available to improve the bankability of projects

EDP Facility	
Instruments	Senior debt ; Quasi-equity;
Eligibility criteria	Innovative technology; Sufficiently mature for commercial demonstration (i.e. TRL7); Replicability potential;
Loan size	Min approx. EUR 7.5m – max EUR 75m (Up to 50% of the project costs)
Tenor	Up to 15 years

Advisory services support eligible projects through their final development steps and prepare them for financing. Such assistance could include:

- Procurement of additional studies to support the project justification.
- Advice on preparation and evaluation of tenders
- Preparation of documentation for due diligence
- Financial advisory

Eligible projects

Carbon capture and storage and use

Energy storage including batteries for both e-mobility and stationary storage

Renewable energy technologies
such as: solar photovoltaic, concentrated solar power, wind energy, bioenergy, geothermal, ocean, hydropower, renewable heating and cooling, renewable fuels

Smart energy systems, including smart grids

Manufacturing processes for innovative technologies

General bankability of projects

EIB lending policies (embedded in the EIB statute) define eligibility of projects:

- meet at least one of the EIB's objectives
- be technically sound
- be financially viable
- show an acceptable economic return
- comply with EU environmental protection and procurement regulations

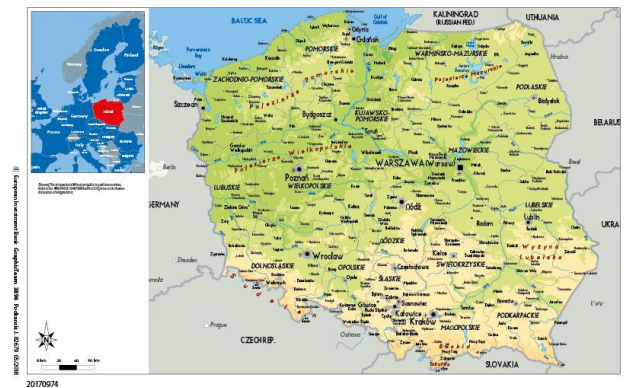
Eligibility of geothermal projects

- New EIB ELP – No major change to geothermal projects eligibility
- No financing of exploration
- Provision of expert studies that prove commercial viability and technical feasibility of projects on the basis of initial project phases results
- Electricity generation: GHG emissions released to the atmosphere below the EPS
- Competitiveness against least cost economic alternatives

Programme loan for upgrade of DH networks in Poland

- Investing in development and optimisation of heat supply services to better serve the existing and future heating demand in DH networks in Poland
- **Targets:** construction of generation assets based on biomass, gas and waste, thus reducing CO₂ and other pollutants emissions
- Foreseen measures: installation or **upgrade** of generation capacity, construction of **new distribution networks** as well as extension and **modernization** of the existing ones.
- Size of “individual projects”: from several million EUR to several 10 million EUR per DH network
- Loan volume : EUR 250m
- 3 projects allocated: Lublin, Bydgoszcz, Gliwice

Project: PROGRAMME LOAN HEATING SECTOR IN POLAND - Poland



Lessons learnt

- Environmental and social aspects can be a barrier to geothermal project financing
 - Induced seismicity
 - Impact of artificial stimulation – Requires appropriate resources and procedures in place at national authority level
 - Groundwater management
 - Resettlement needs to be managed in line with Leading IFI's E&S standards
- Challenging economics for stand-alone geothermal district heating or power generation in Europe
- Water sourcing (in particular for drilling operations) can be an issue in particular in African countries
- Lack of risk guarantee mechanisms to cover initial stages or lower wells output

BACK-UP SLIDES

ELENA

Savings Identification

Energy Savings & Reduced CO₂ Emissions

Technical Assistance Support

Eligible Investment Programmes

Eligible Costs (up to 90%)

Expertise

Energy Efficiency & Renewable Energy

Urban Transport & Mobility

- Feasibility & market studies
- Programme structuring
- Business plans
- Energy audits
- Financial structuring
- Tendering procedure
- Contractual arrangement

- Recruit additional staff
- Hire experts and advisors
- Costs of personnel assigned to the project

- EE renovations of public and private buildings
- Street and traffic lighting
- **Integration of renewable energy sources into the buildings**
- **Investments in district heating/cooling networks**
- Local energy facilities (e.g. smart grids)

- Clean and energy efficient transport vehicles: trams, trolleybuses, metros, trains
- Investment in public transport



Paris Alignment Framework

- Which projects are likely to be deemed aligned, aligned under conditions and not aligned?
- Other Paris alignment dimensions such as support to clients' decarbonisation strategies.
- Focus on just transition and inclusion.

Climate Action and Environmental Sustainability (CA&ES) definitions

- Existing EIB Climate Action definitions well established, harmonised with joint MDB climate finance tracking methodology.
- Environmental Sustainability definitions to be refined.
- Alignment with EU Taxonomy.