



GLOBAL GEOTHERMAL ALLIANCE



Industry's point of view on current and perspective development of binary geothermal technology worldwide and the role of public policy

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*Ministero degli Affari Esteri
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*Ministero
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MINISTERO DELL'AMBIENTE
E DELLA TUTELA DEL TERRITORIO E DEL MARE



IRENA
International Renewable Energy Agency



Geothermal binary plants

Advantages

- ❖ full reinjection
- ❖ low-negligible emission of CO₂ and local air pollutants
- ❖ stable base-load energy
- ❖ relatively low cost per kWh
- ❖ proven-mature technology
- ❖ scalable to utility size without taking up much land/space

Outlook

growing interest for binary
in “**traditional high enthalpy geothermal**” countries like *Kenya, The Philippines, Indonesia, Latin America, Italy, ...*

in “**newcomer geothermal**” countries like *Turkey, Germany, East Africa, China, ...*



Untapped opportunities

Where new drilling is not required development risks are lower

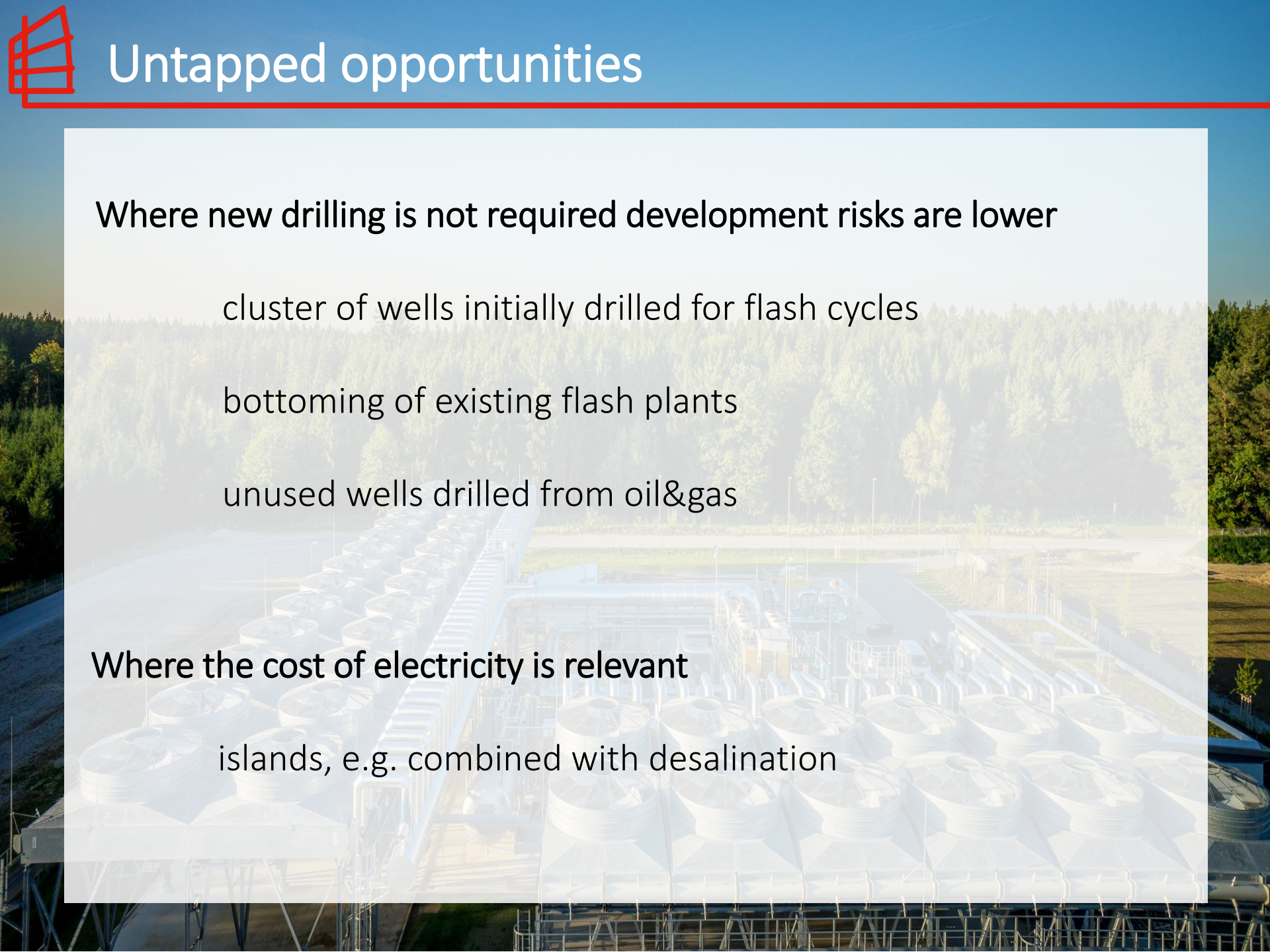
cluster of wells initially drilled for flash cycles

bottoming of existing flash plants

unused wells drilled from oil&gas

Where the cost of electricity is relevant

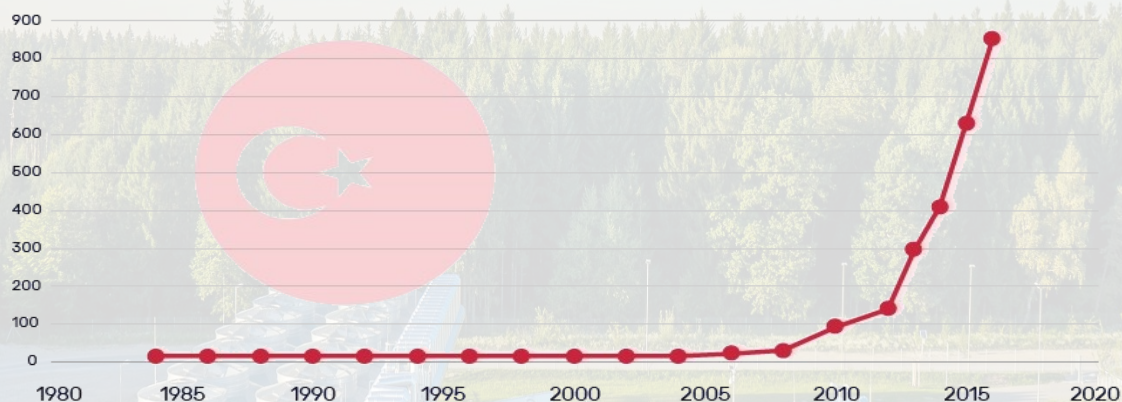
islands, e.g. combined with desalination



Key factors for development

Political commitment and long term perspective (e.g. Turkey)

Geothermal power: trend of installed capacity in Turkey (MWe)



Source: EGEC 2016 Geothermal Market Report

Credit institutes should set up **specialized teams** to assess the investment in geothermal, as done for PV and wind in the past.
Expertise is key!