



Visione Strategica per lo Sviluppo Geotermico in Europa al 2050

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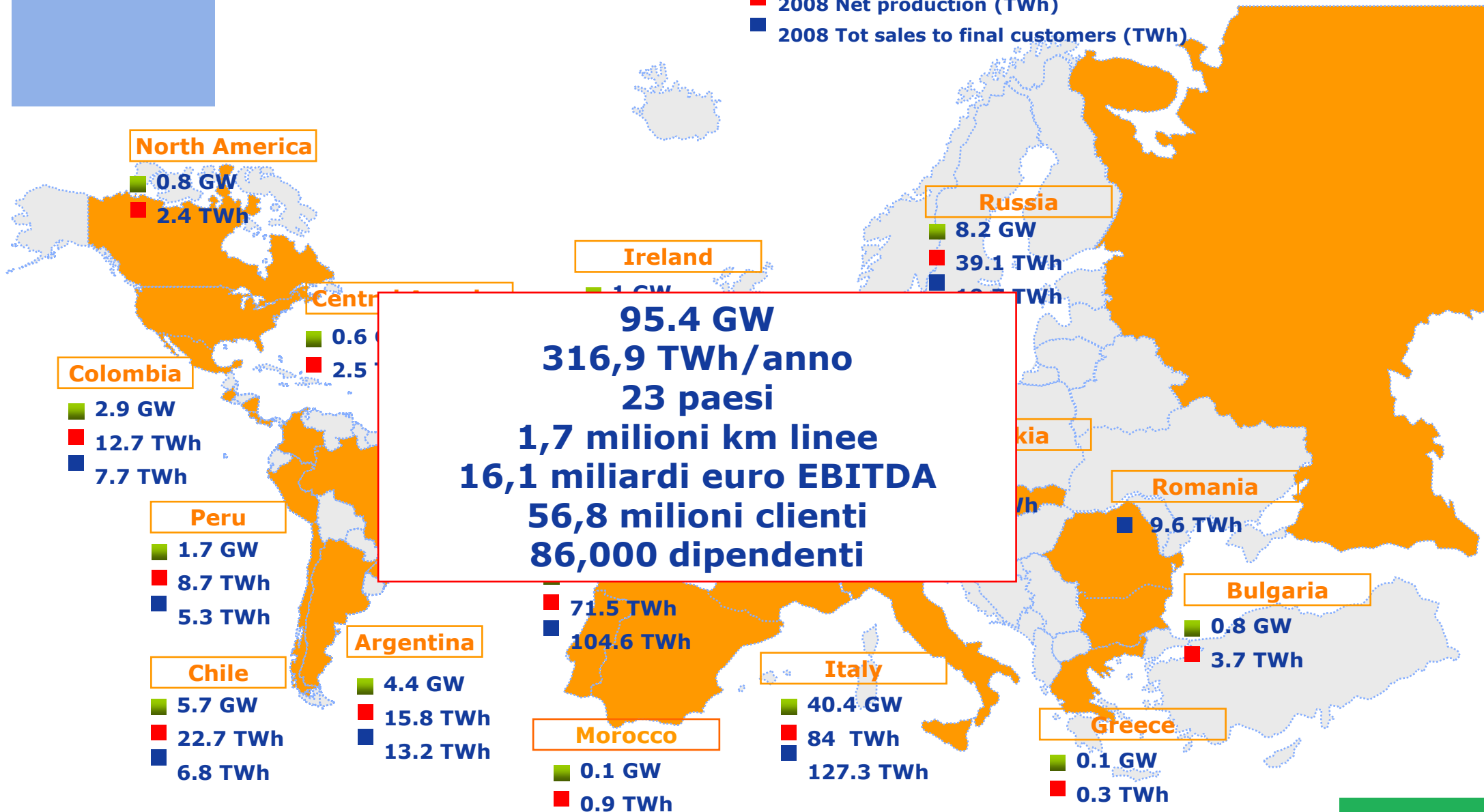
Vice Presidente EGEC

Italia

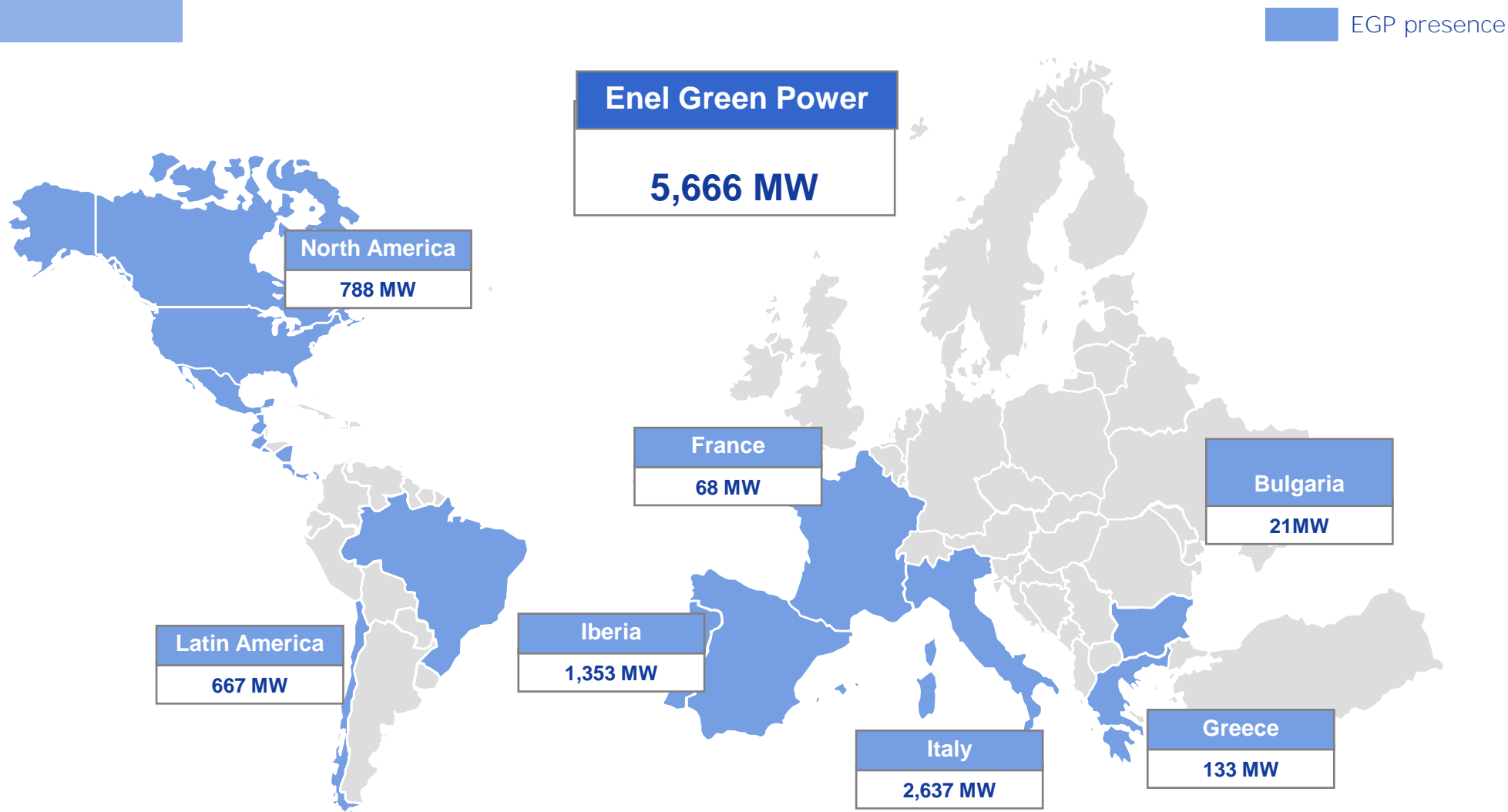


Gruppo Enel

- 2009 Installed capacity (GW)
- 2008 Net production (TWh)
- 2008 Tot sales to final customers (TWh)



Enel Green Power



20,7 TWh Produzione EGP nel 2009



Enel Green Power

Enel Green Power

Tecnologia	Capacità istallata netta	
	2009	
Idro	2,532 MW	Italy – Iberia – Europe – North America – Latin America
Geotermia	741 MW	Italy – North America – Latin America
Vento	2256 MW	Italy – Iberia – Europe – North America – Latin America
Solare	17 MW	Iberia - Italy (retail and module manufacturing)
Biomasse	120 MW	Iberia – North America
TOTALE	5,666 MW	



Enel nel mondo geotermico



In 1921 El Tatio, North Chile, *Larderello S.p.A.* fece l'esplorazione e perforò 2 pozzi

... Enel ha operato in 15 paesi, sia direttamente che come consulente.



Enel Green Power: presenza nel mondo

North America

2 plants in operations
in Nevada (binary)

Other binary projects on
going in California,
Nevada, Utah

Latin America

NICARAGUA

1 greenfield project under exploration (flash)

GUATEMALA

2 greenfield projects under exploration (flash)

EL SALVADOR

Partnership with LaGeo for project in operations
(200 MW flash)

CHILE

JV with ENAP (Empresa Nacional del Petroleo) 2
geothermal exploration and additional permits (flash),
more than 100 MW

Drilling on going (two deep productive wells
completed) in the Apacheta area,
in the Chilean Andes

Europe

Valuation of binary and flash opportunities in
Greece, Slovak, Hungary, France.
Preliminary agreements for
Turkey and Spain greenfield explorations

Italy

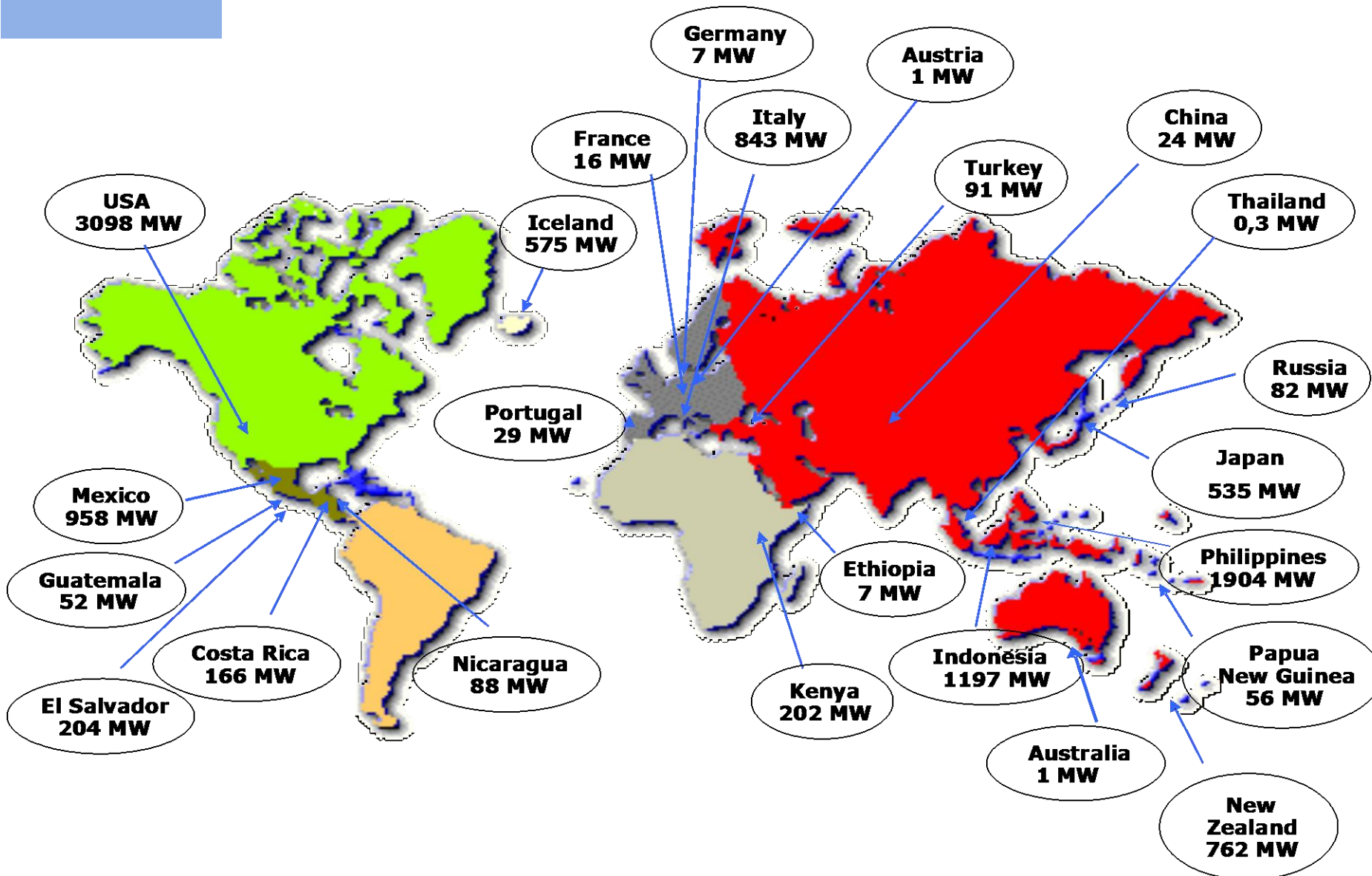
32 plants in
operation (steam and flash)

810 MW

New steam and flash plants
planned for 110 MW



2010 Mondo geotermico: 10,9 GW & 67,2 TWh



2010 Mondo geotermico : installati > 500 MW



COUNTRY	2005 MW	2005 GWh	2010 MW	2010 GWh
USA	2,534	16,840	3,098	16,603
PHILIPPINES	1,930	9,253	1,904	10,311
INDONESIA	797	6,085	1,197	9,600
MEXICO	953	6,282	958	7,047
ITALY	791	5,340	843	5,520
NEW ZEALAND	435	2,774	762	4,055
ICELAND	202	1,483	575	4,597
JAPAN	535	3,467	536	3,064



2010 Mondo geotermico : crescita >50 MW

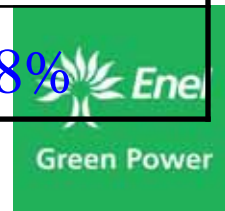


COUNTRY	2010 MW	2010 GWh	NEW MW	NEW GWh
USA	3,098	16,603	564	-237
INDONESIA	1,197	9,600	400	3,515
ICELAND	575	4,597	373	3,114
NEW ZEALAND	762	4,055	327	1,281
TURKEY	91	490	71	385
EL SALVADOR	204	1,422	53	455
ITALY	843	5,520	52	180
PAPUA–NEW GUINEA	56	450	50	433



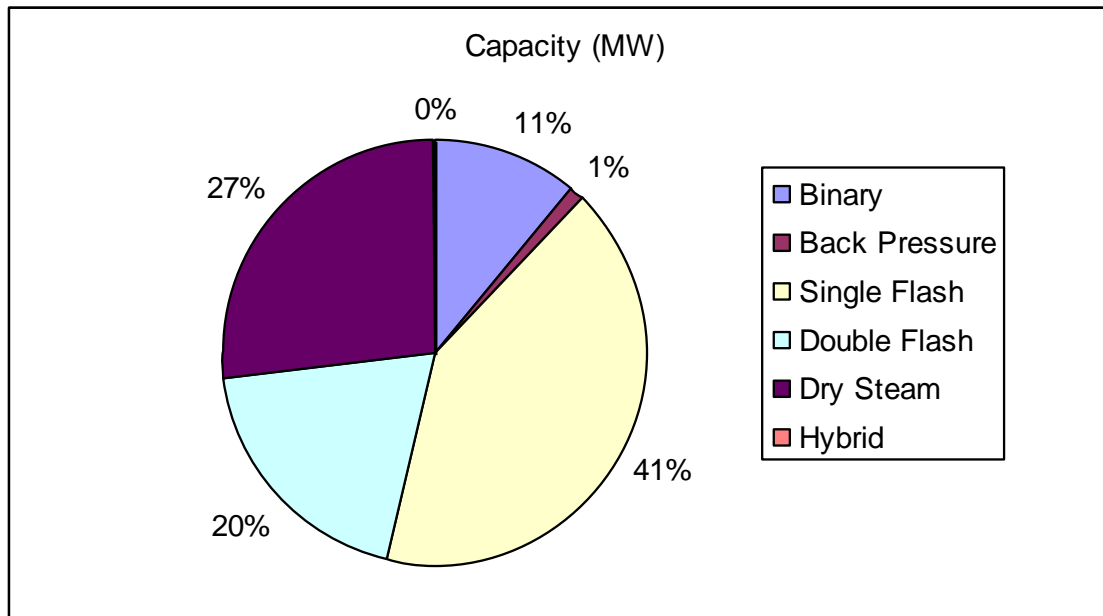
2010 Mondo geotermico : crescita >50 %

COUNTRY	NEW MW	NEW GWh	%MW	%GWh
GERMANY	7	49	2,987%	3,249%
PAPUA-NEW GUINEA	50	433	833%	2,547%
AUSTRALIA	1	0	633%	-5%
TURKEY	71	385	356%	368%
ICELAND	373	3,114	184%	210%
PORTUGAL	13	85	78%	94%
GUATEMALA	19	77	58%	36%
INDONESIA	400	3,515	50%	58%



2010 Mondo geotermico : Impianti

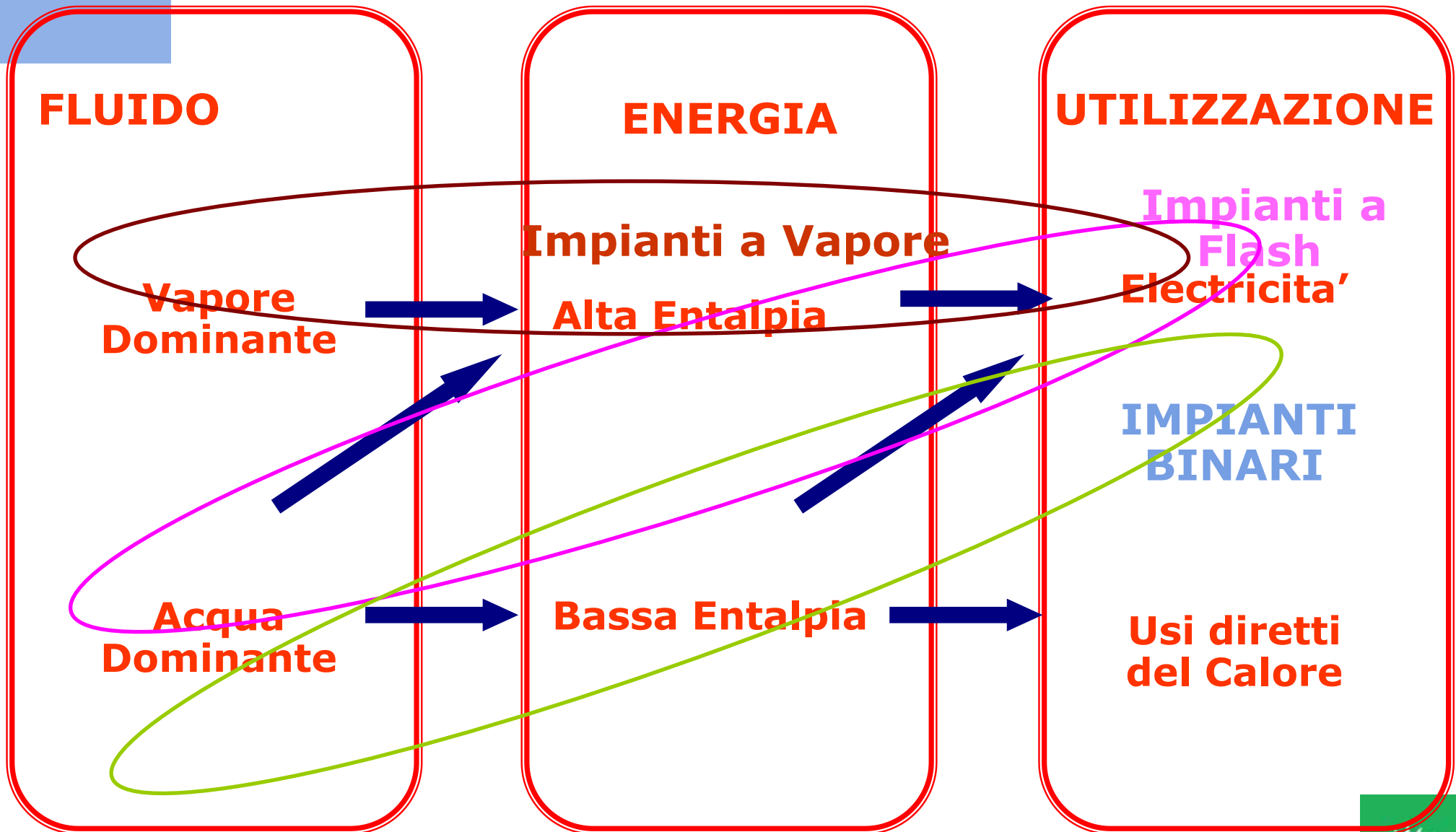
Dal WGC2005, 146 nuove unità sono entrate in servizio su un totale di 536



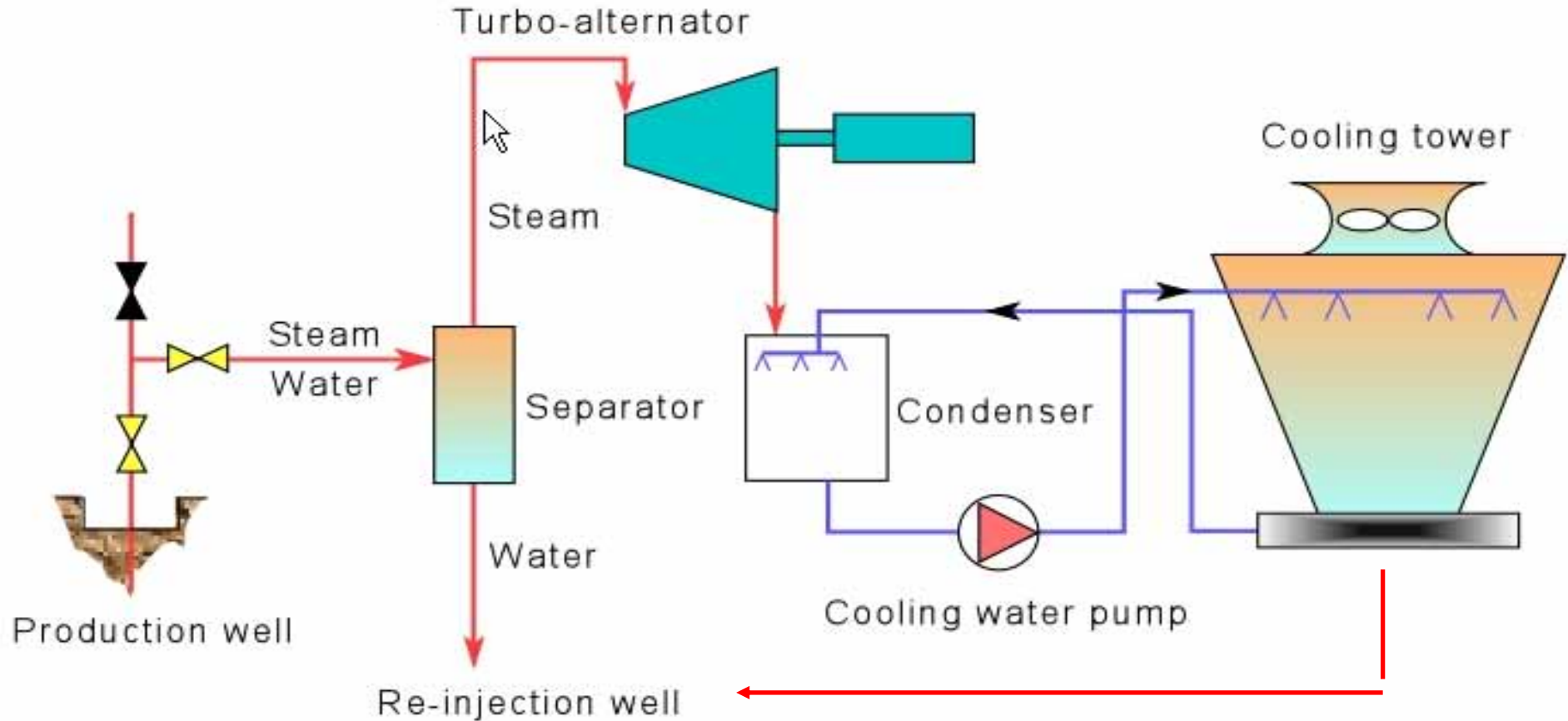
TYPE	Average Energy (GWh/ unit)	Average Capacity (MW/unit)
Binary	27	5
Back Pressure	96	6
Single Flash	199	31
Double Flash	236	34
Dry Steam	260	46



Sistemi geotermici



Impianti Geotermici: Vapore/Flash



Impianti Geotermici: Vapore/Flash



Larderello – Italy

Pecore Geotermiche
New Zealand



Impianti Geotermici: Vapore/Flash



Larderello – Italy

Impianti Geotermici: Vapore/Flash



Berlin – El Salvador

Impianti Geotermici: Binari

Un
Impianto
Binario
è una pentola
d'oro alla base
di un
arcobaleno

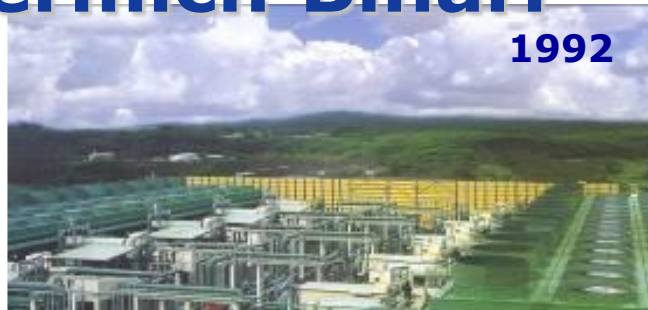


Impianti Geotermici: Binari



1987

57 MW Ormesa California



1992

30 MW Puna Hawaii



1996

**125 MW Upper Mahiao
Philippines**



1999

24 MW Zumil, Guatemala



2000

8 MW Olkaria, Kenia



30 MW Steamboat Springs, Nevada



1992

40 MW Heber California,



1994,
1998

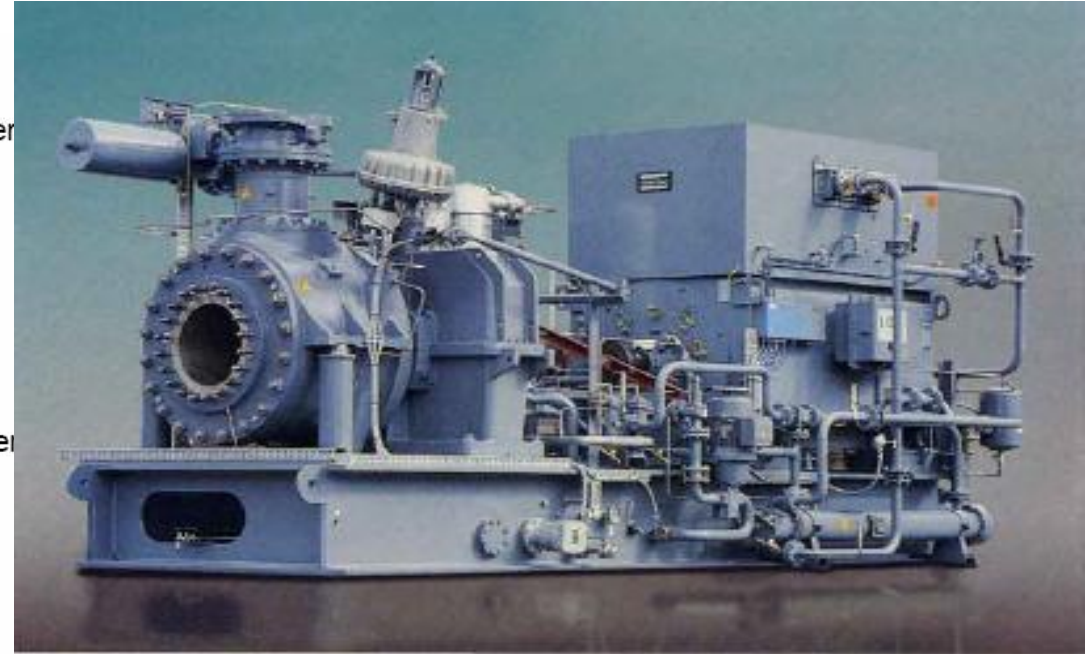
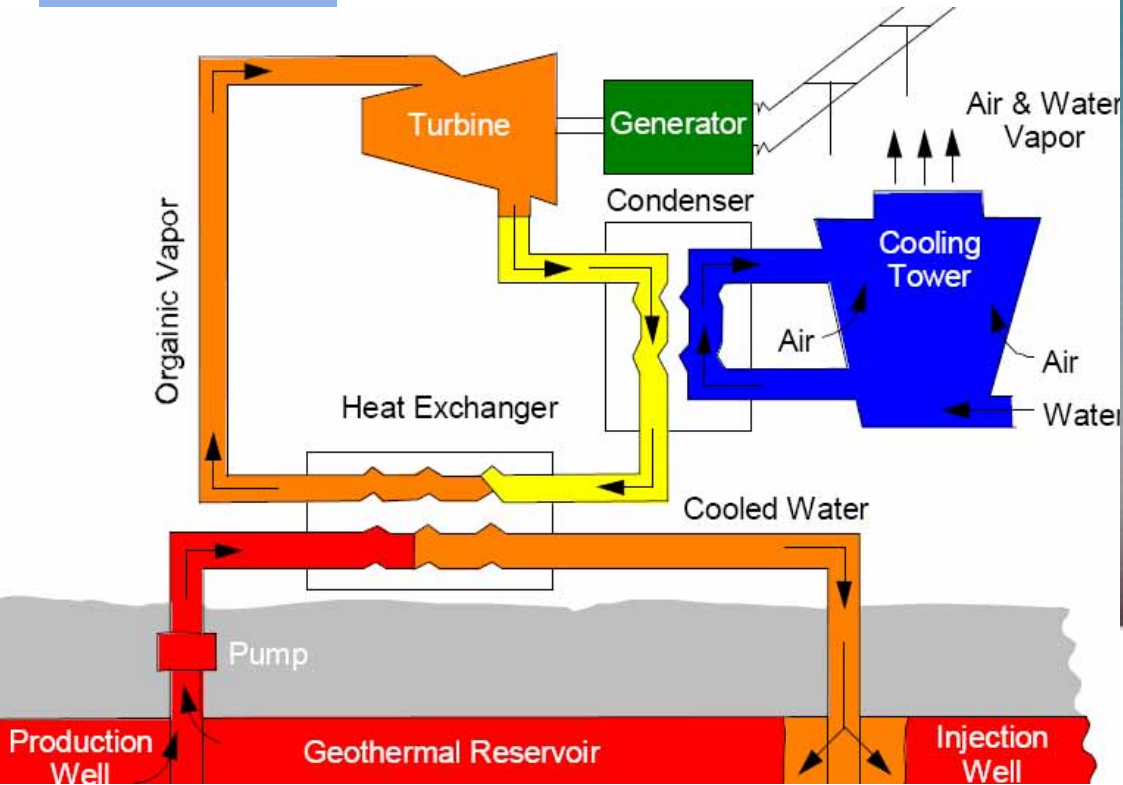
**14 MW Sao Miguel
Azores Islands**



2000,
2005

100 MW Mokai New Zealand

Impianti Geotermici: Binari



Impianti Geotermici: Binari



Impianti Geotermici: Binari



Impianti Geotermici: bottom-cycle

Il fluido a 170°C che viene avviato alla reiniezione calda è circa 2-3 volte la quota di vapore, secondo la temperatura dell'acqua; questa energia può essere utilizzata in un **BOTTOM CYCLE BINARY PLANT**

Non condensable gas

Average value for 20 MW plant (Res. Temp. 300°C)

- Fluid extraction 470 t/h
- Steam in 140 t/h Fluid (30% of the fluid)
- Flash: temperature 170°C and pressure 8 bar
- Gas out 4 t/h
- Cold Reinjection 40 t/h
- Hot reinjection 330 t/h
- Cooling tower evaporation 96 t/h (75% of steam)

Two phase mixture from reservoir

separator

Gas extractor

turbine

generator

Liquid phase for the reinjection at 170°C

Cooling tower

condenser

Discarded water

Cold reinjection (20°)

Steam and non condensable gas

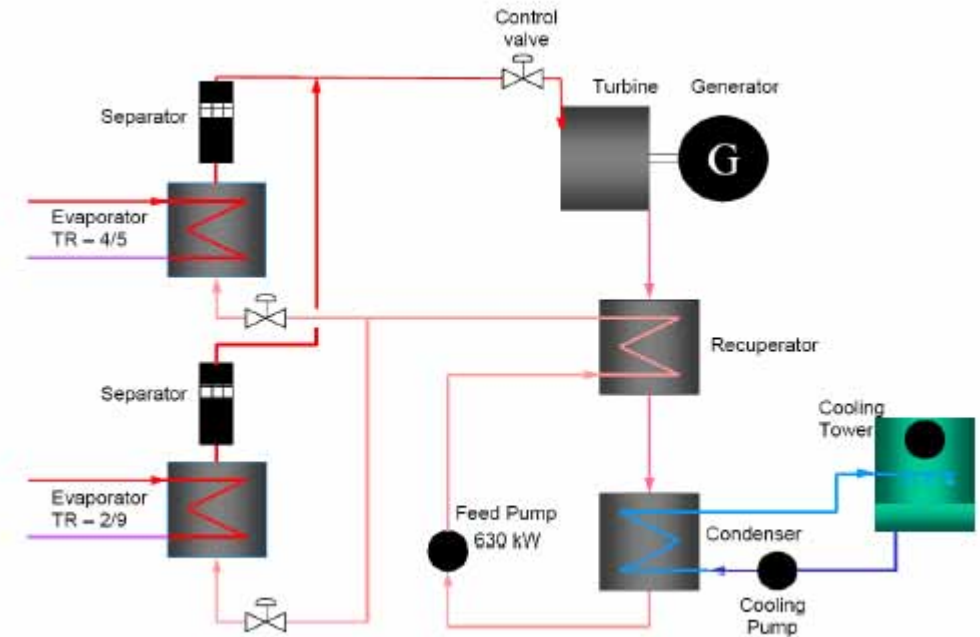


Impianti Geotermici: bottom-cycle

In El Salvador, LaGeo ha installato un BOTTOM-CYCLE, abbinato alla centrale di Berlin (2x28 MW, 1999), usando l'acqua separata da 4 pozzi; L'isopentano alimenta una turbina da 9,5 MW lordi

Generando 7,8 MW netti

Il costo e' di soli 16,5 MUSD, con un ritorno estremamente positivi, non avendo costi minerari associati (IRR 18%)



1,000 t/h a 180°C
isopentane 700 t/h
160°C → 44°C



Impianti Geotermici: bottom-cycle



Aerial view of Berlin power plant in eastern El Salvador.

Geotermica S. Salvador S. A.

Heat Exchanger



Power Plant Housing



Turbine

2010 Mondo geotermico: impianti

La Potenza media su tutte le
536 unita' in servizio vale 20.6 MW

BIG

Solo **65 unita'** con potenza > 55 MW,
(media 74 MW).

SMALL

Ben **270 units** con potenza < 10 MW,
(media 3.2 MW).

Di cui 207 unita' impianti binari



2010 Mondo geotermico: Il Record

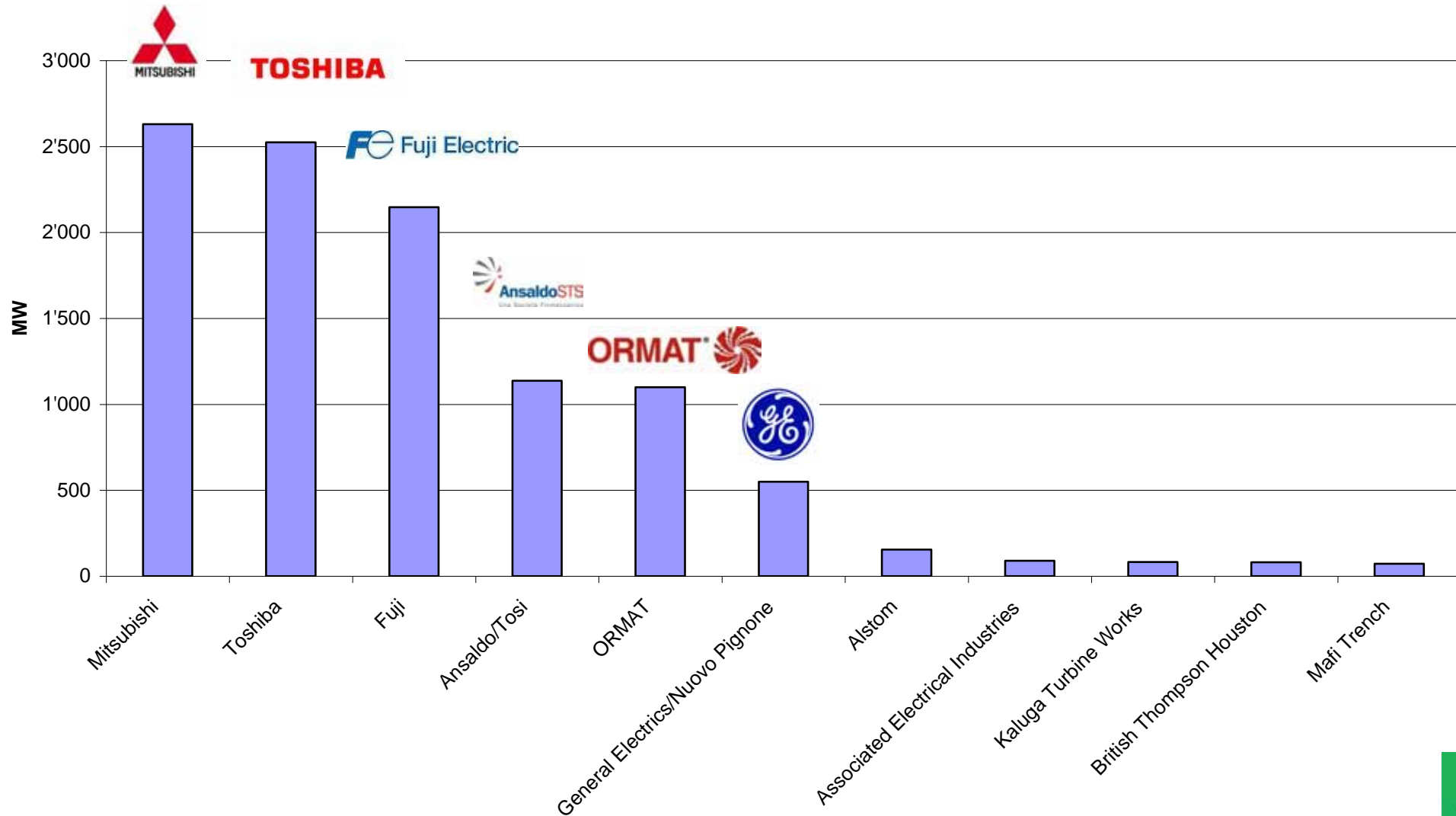
Country	Geothermal Field	Plant Name	Unit	COD	Typology
New Zealand	Rotokawa	Nga Awa Purua	1	2010	Single Flash

Manufacturer	Plant Owner	Installed Capacity [MW]
Fuji	Mighty River Power	132

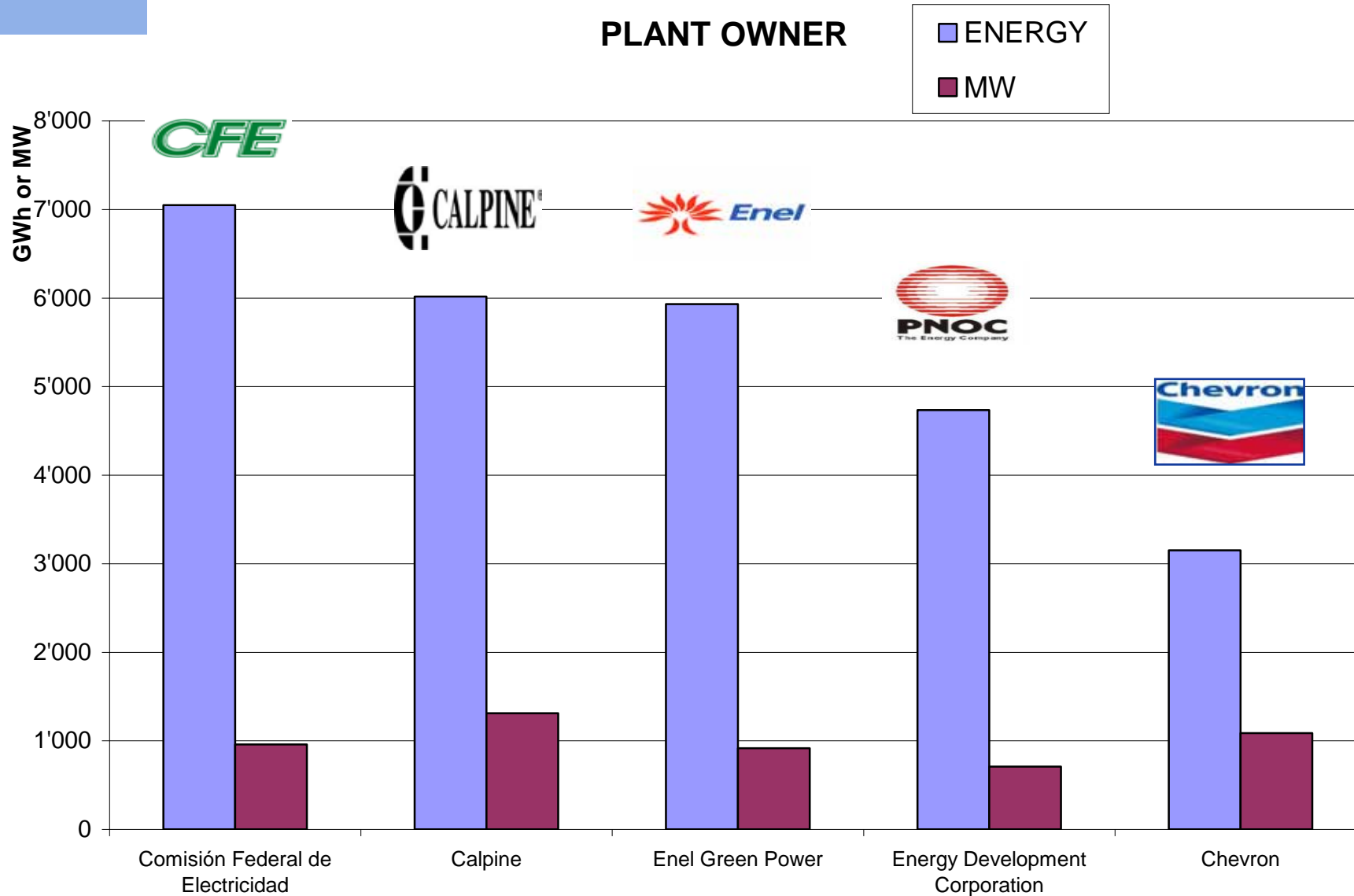


2010 Mondo geotermico: Costruttori

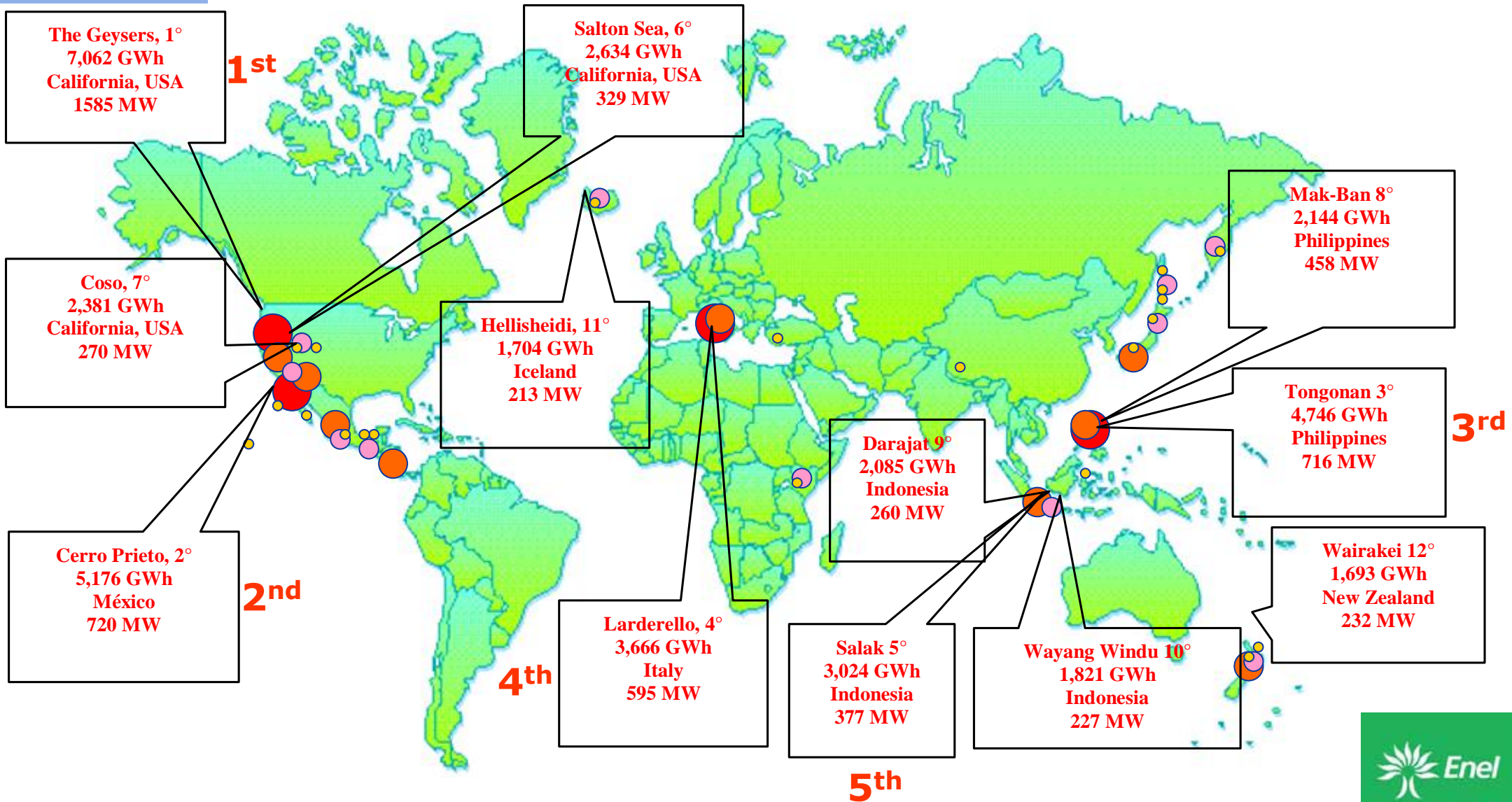
Turbine Manufacturer Market



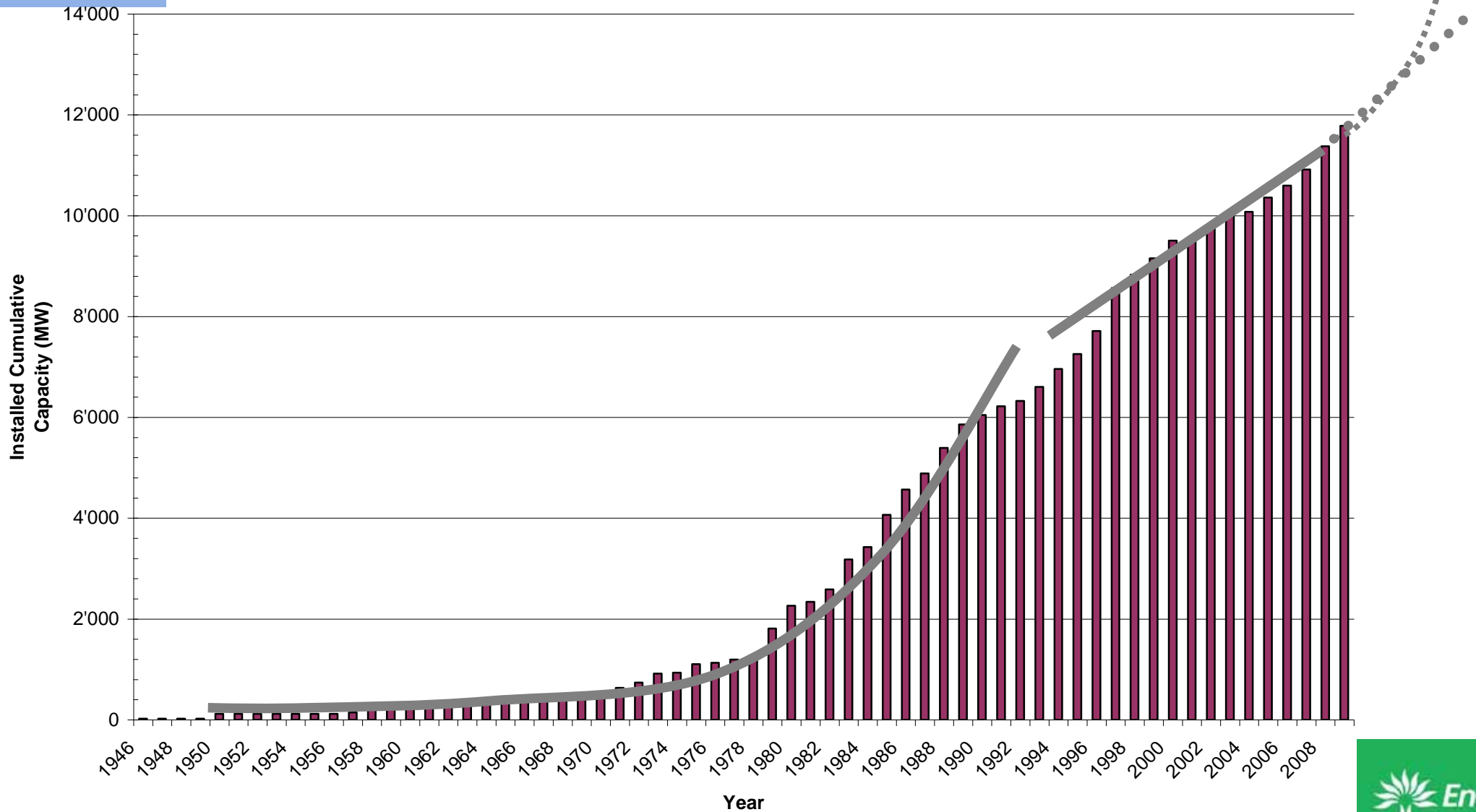
2010 Mondo geotermico: Operatori



2010 Mondo geotermico: Campi



2010 Mondo geotermico: Storia



2010 Mondo geotermico: Storia

1980-1990 un periodo di grande crescita, ma si puo considerare "anno geotermico" il 1997, con 850 MW in esercizio.

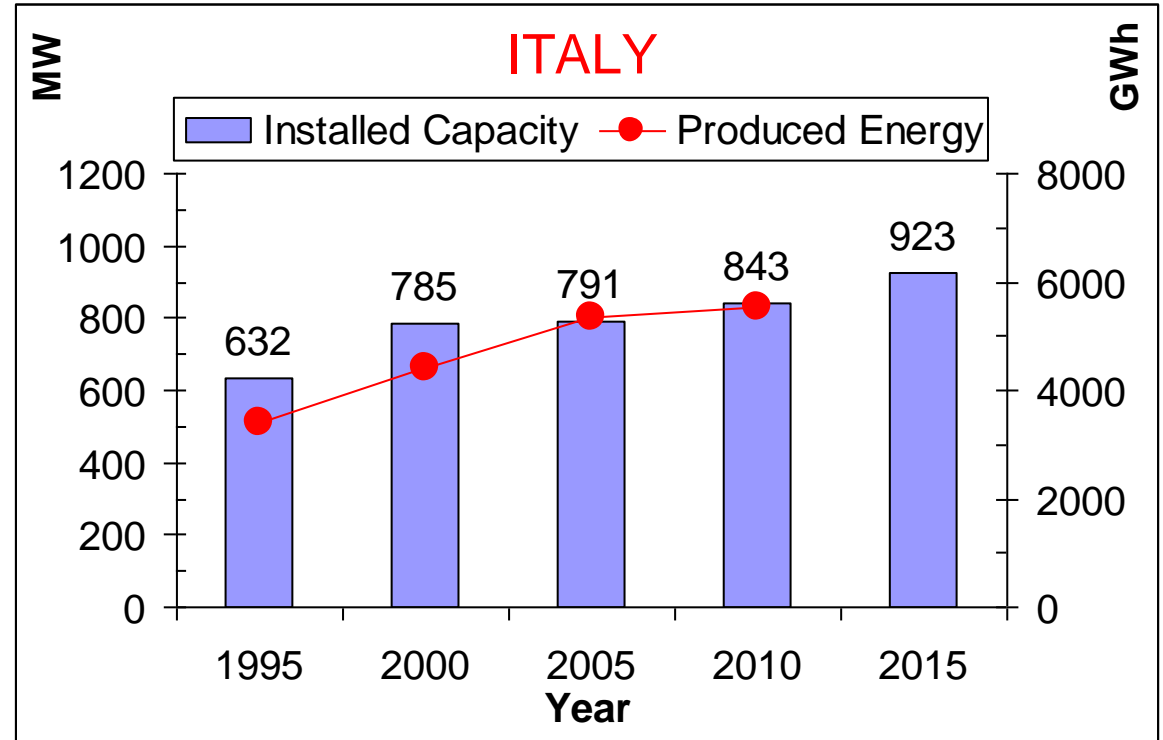
Ma per gli impianti binari il record e' 183 MW nel 2009.

Il tasso di crescita dal 1990 e' 300 MW/anno.

Negli ultimi 5 anni siamo passati a 400 MW/anno

Country	COD
Italy	1914
Japan	1925
New Zealand	1958
USA	1960
Russia	1966
Iceland	1969
China	1970
Mexico	1973
Turkey	1974
El Salvador	1975
Philippines	1977
Indonesia	1978
Portugal	1980
Kenya	1981
Taiwan	1981
Nicaragua	1983
France	1984
Australia	1987
Greece	1987
Argentina	1988
Thailand	1989
Costa Rica	1994
Guatemala	1998
Ethiopia	1999
Austria	2001
Papua New Guinea	2001
Germany	2003

2010 Mondo geotermico: Italia



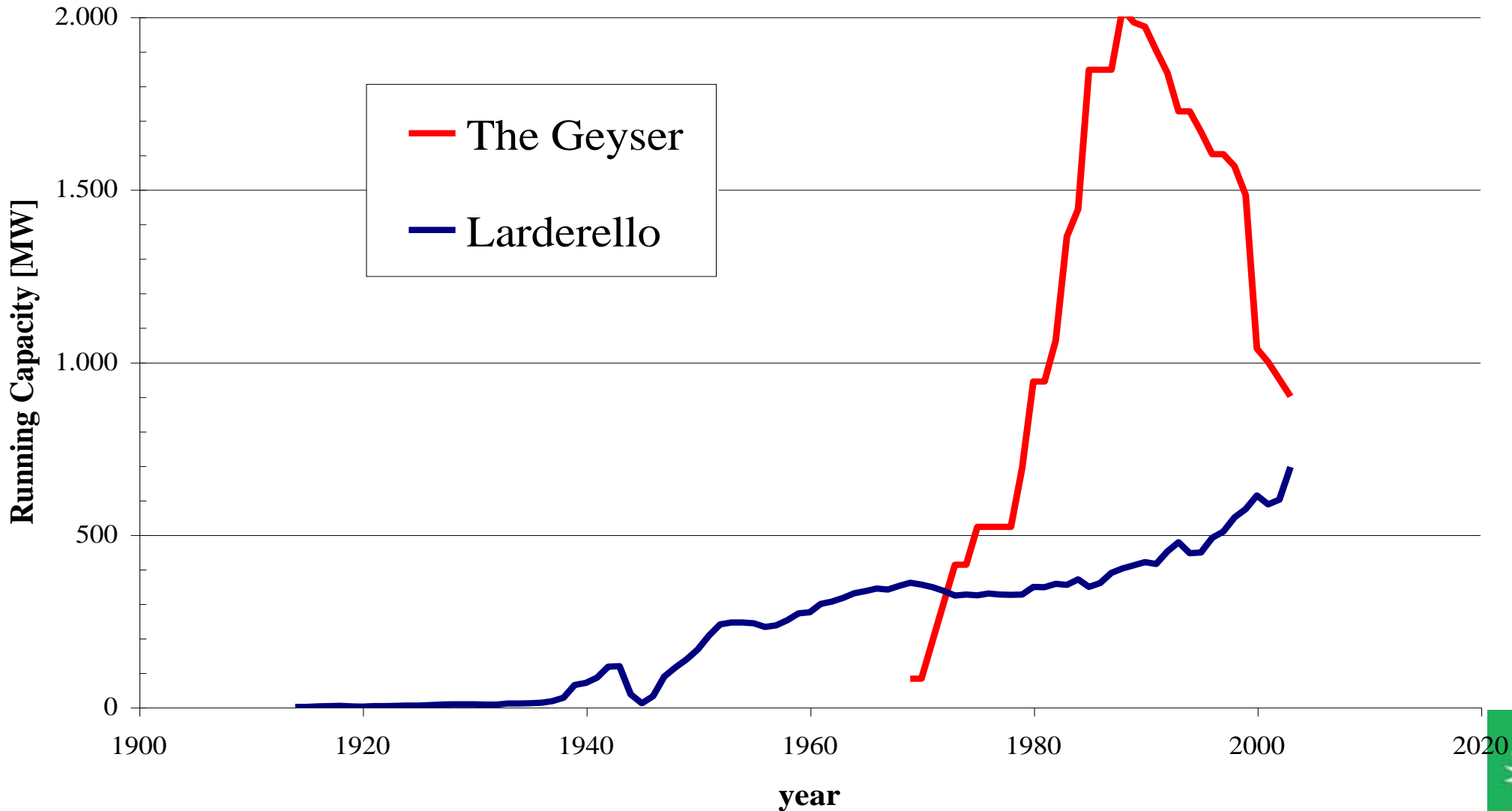
**Larderello [A, 594 MW],
Travale/Radicondoli [B, 160 MW],
2 MPa, 270°C, vapore, 400 km²**

**Bagnore [C, 20 MW]
Piancastagnaio [D, 68 MW]
Acqua, 20 MPa, 300°, dal 1960**

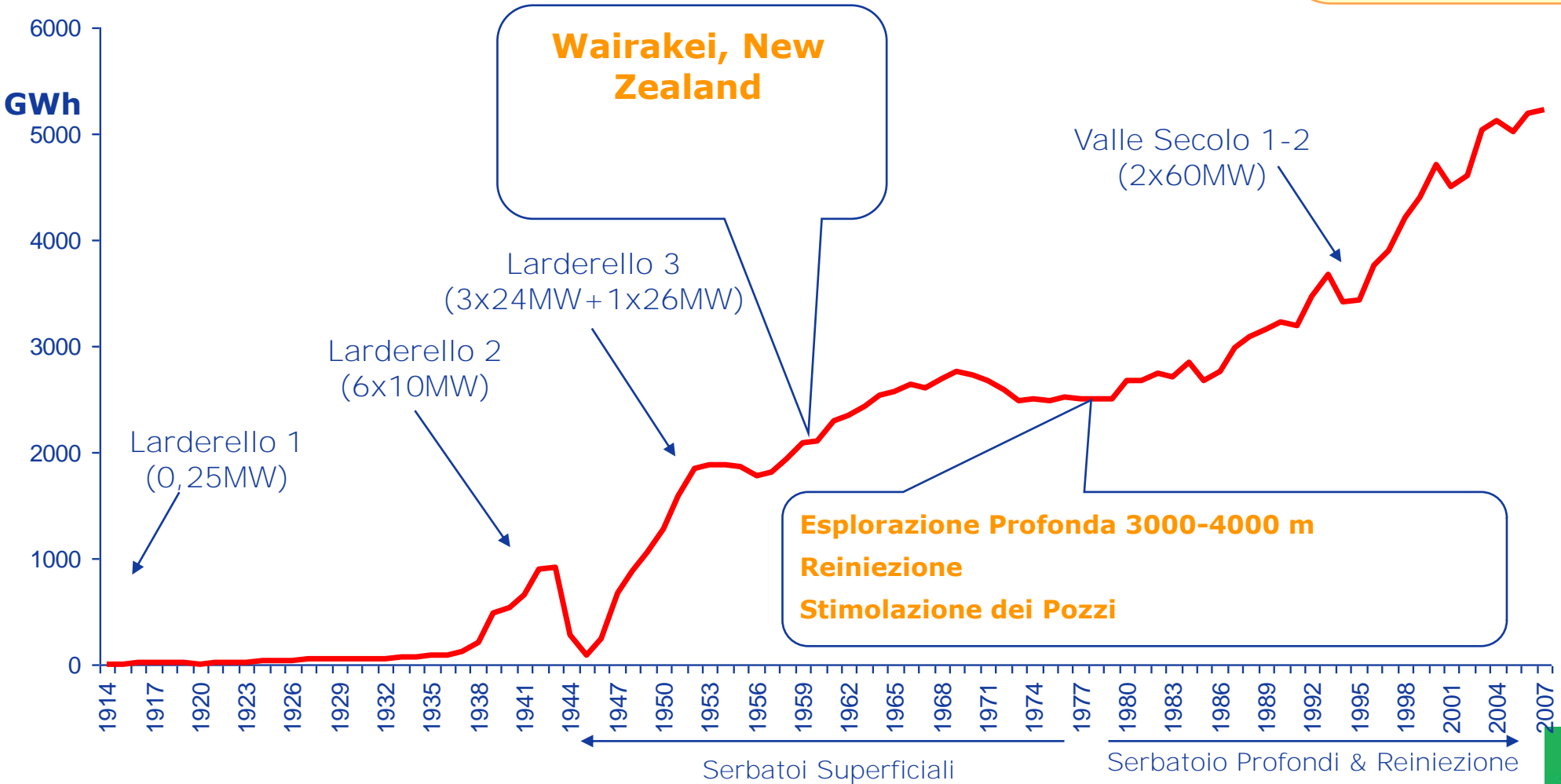
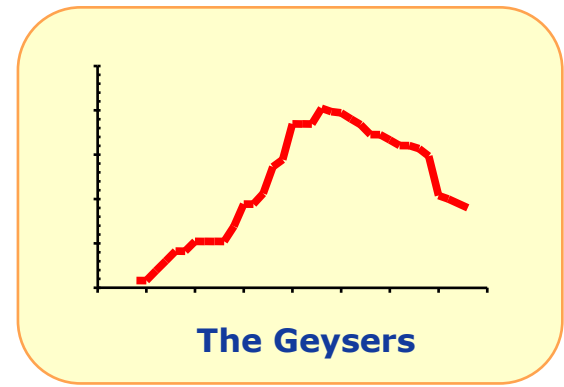


2010 Mondo geotermico: Italia

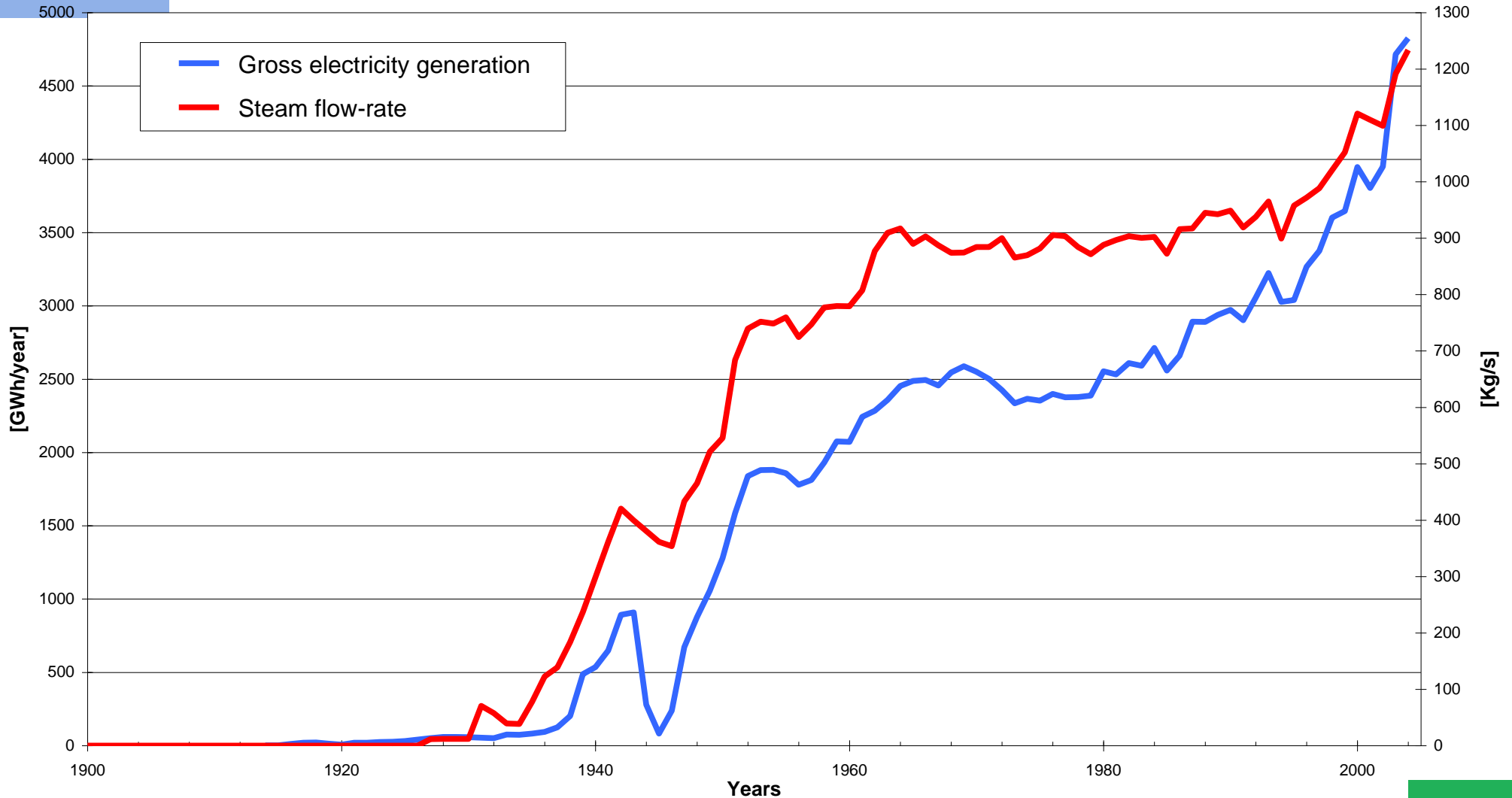
Larderello and The Geyser: running capacity comparison



2010 Mondo geotermico: Italia

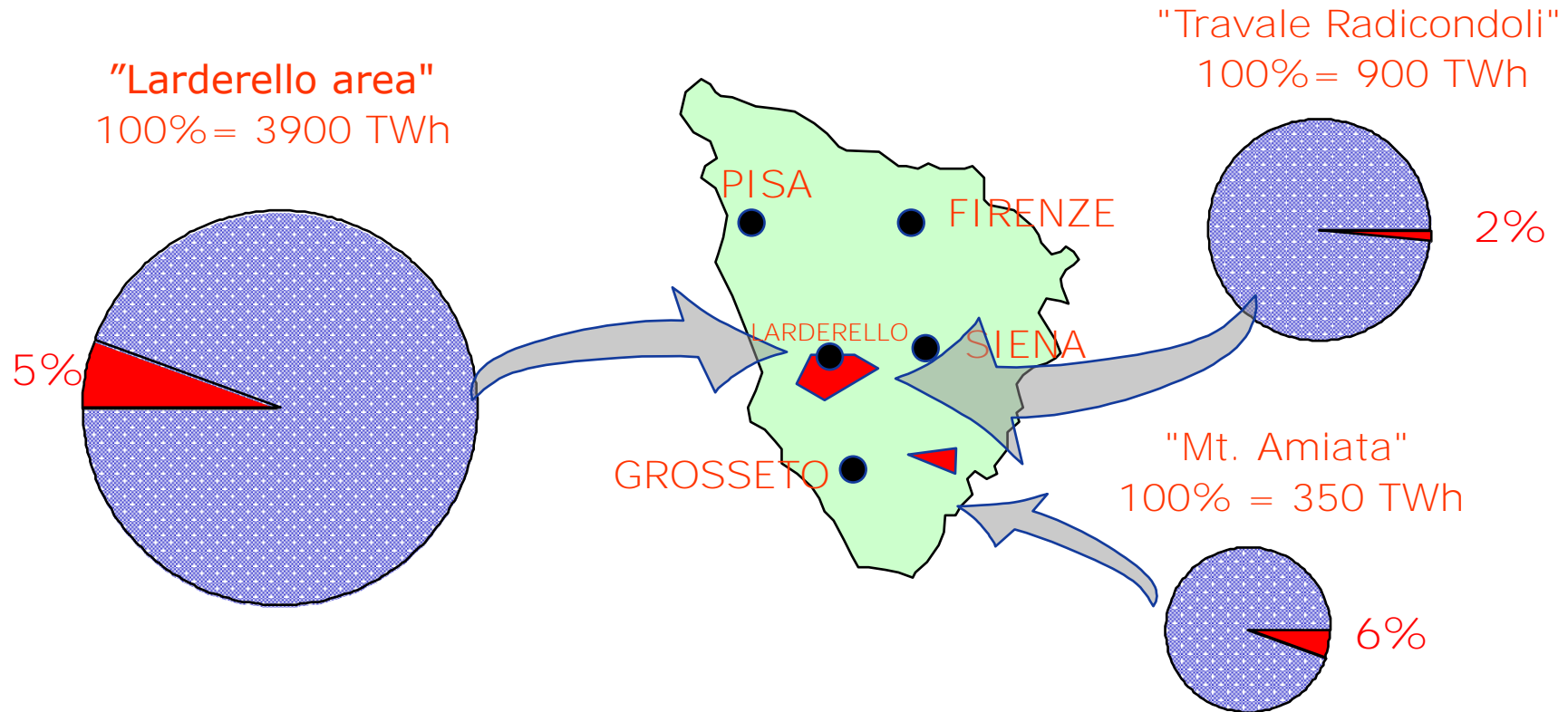


2010 Mondo geotermico: Italia

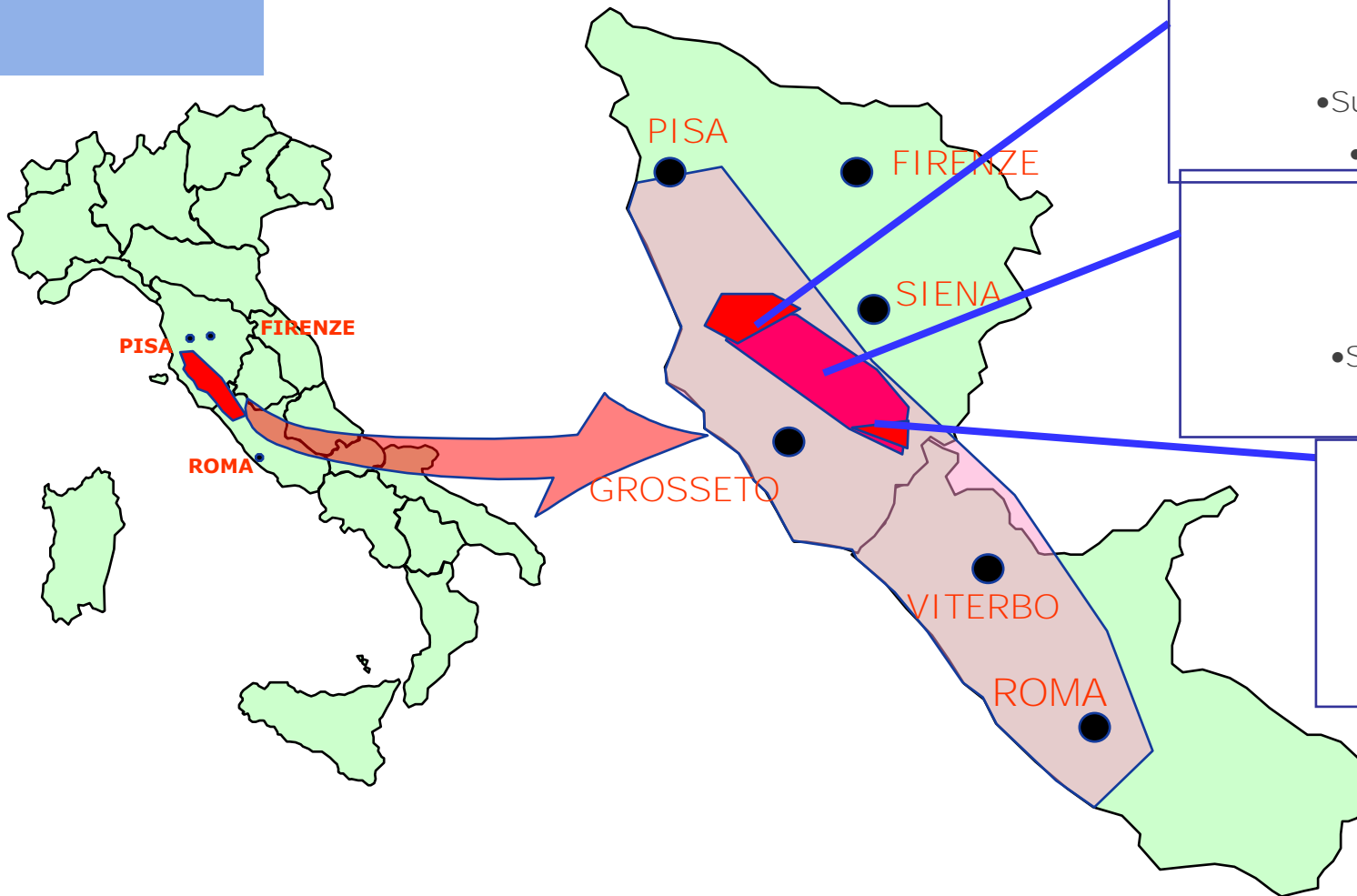


2010 Mondo geotermico: Italia

Quota di Energia Termica utilizzata (%)



2010 Mondo geotermico: Italia



Larderello

- from 1913
- 250 km²
- Superheated steam
- Power : 508MW

Radicondoli - Travale

- From 1950
- 30 km²
- Saturated and superheated steam
- Power : 150 MW

Amiata

- From 1955
- 50 km²
- water dominated fields
- Power: 79 MW

737 MW potenza netta



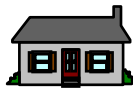
2010 Mondo geotermico: Italia

⇒ Energia fornita da Enel ⇒ 299 Tcal (29,9 kTEP)

⇒ Mancata emissione di CO₂ ⇒ 92.716 ton



• Serre 43 %



• Teleriscaldamento 52 %



• Usi industriali 4 %

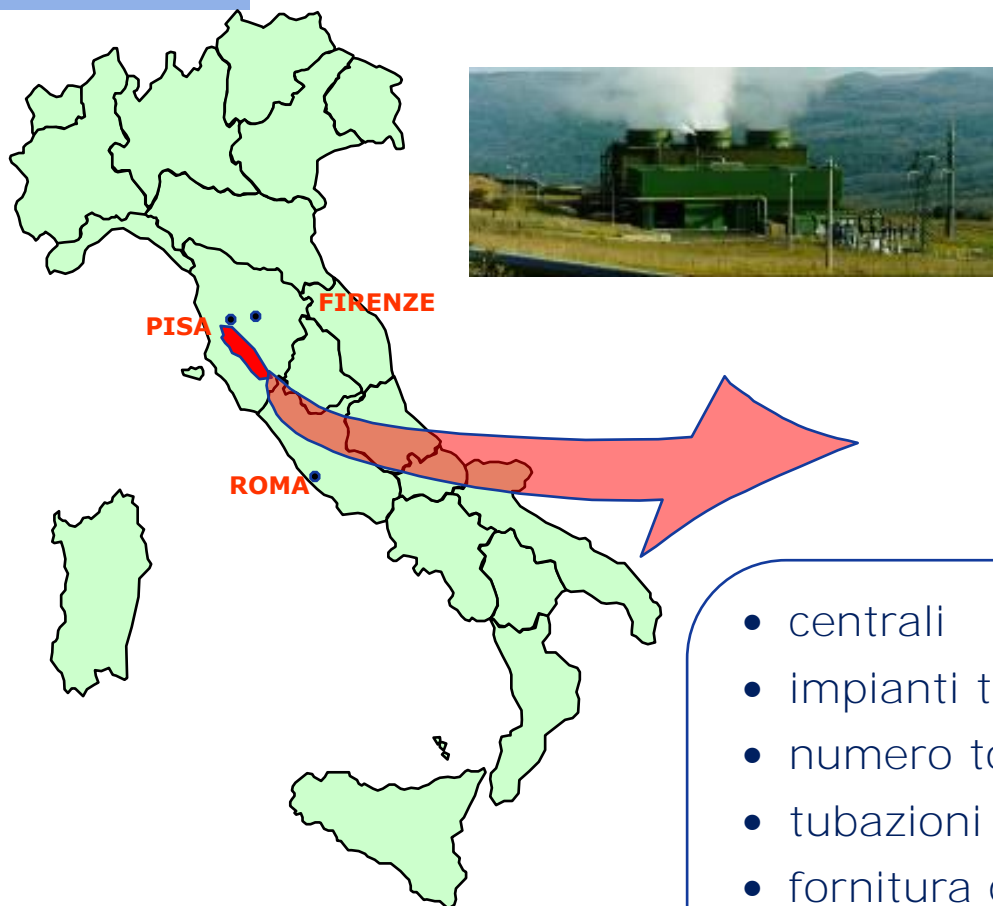


• Agro alimentare 1 %



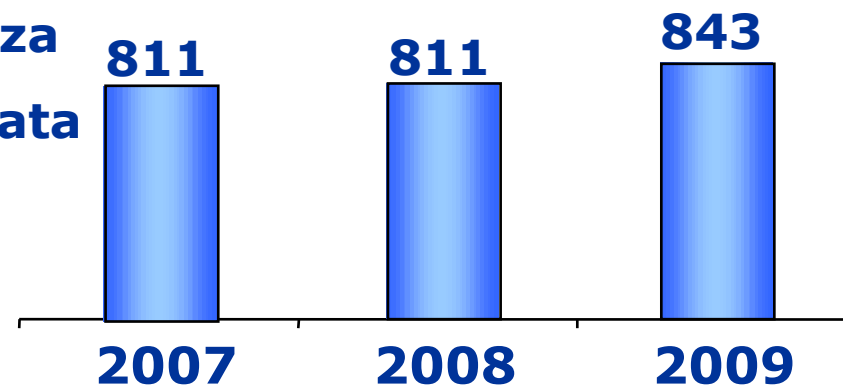
• Produzione CO₂ 25.965 ton

2010 Mondo geotermico: Italia



**Potenza
Installata**

MW



- centrali **32**
- impianti teleriscaldamento **48**
- numero totale pozzi **491**
- tubazioni trasporto fluido (km) **505**
- fornitura di calore (Tcal) **299**
- CO₂ evitata (Mt) **3,5**
- risparmio TEP (MTEP) **1,1**
- 700 dipendenti

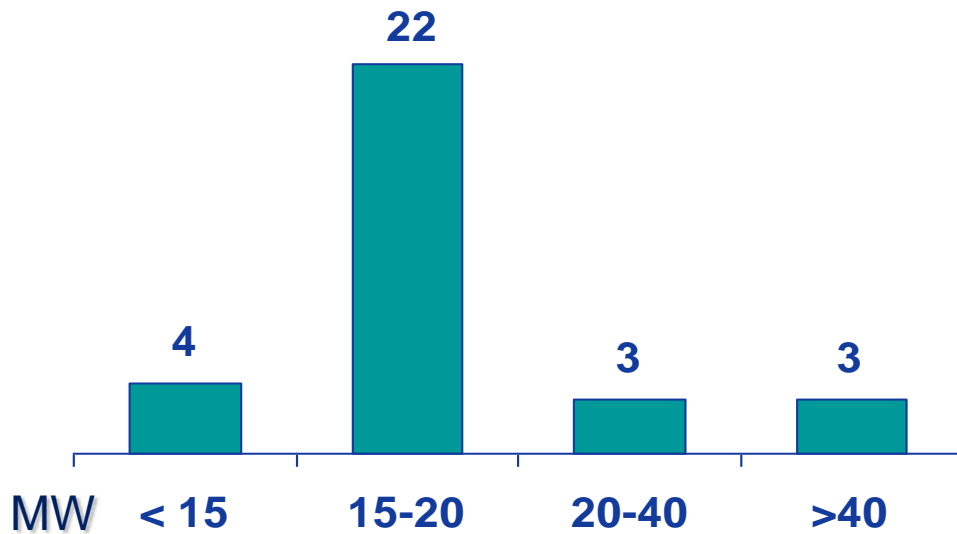
Dati al 31/12/2009



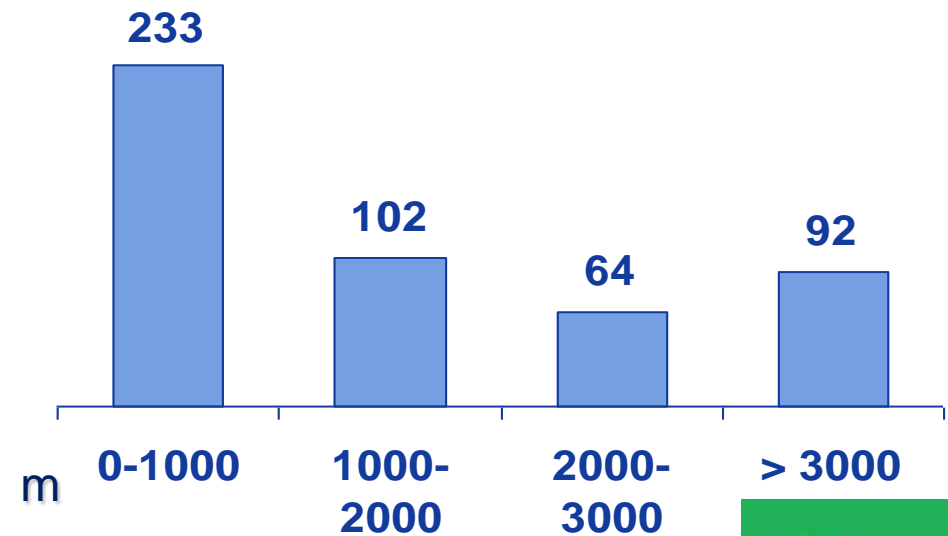
2010 Mondo geotermico: Italia



Numero Impianti



Numero pozzi



*31/12/2009



2010 Mondo geotermico: Italia

Valle secolo 2X 60 Mw



Carboli 2X 20 Mw



2010 Mondo geotermico: Italia

Produzione n. 304

Reiniezione n. 62

Controllo n. 125 zione



Complessità Crescente



- Riduzione del rumore
- Separazione del condensato
- Trattamento del fluido

2010 Mondo geotermico: Italia

Vapore 205 Km

Acqua 294 Km

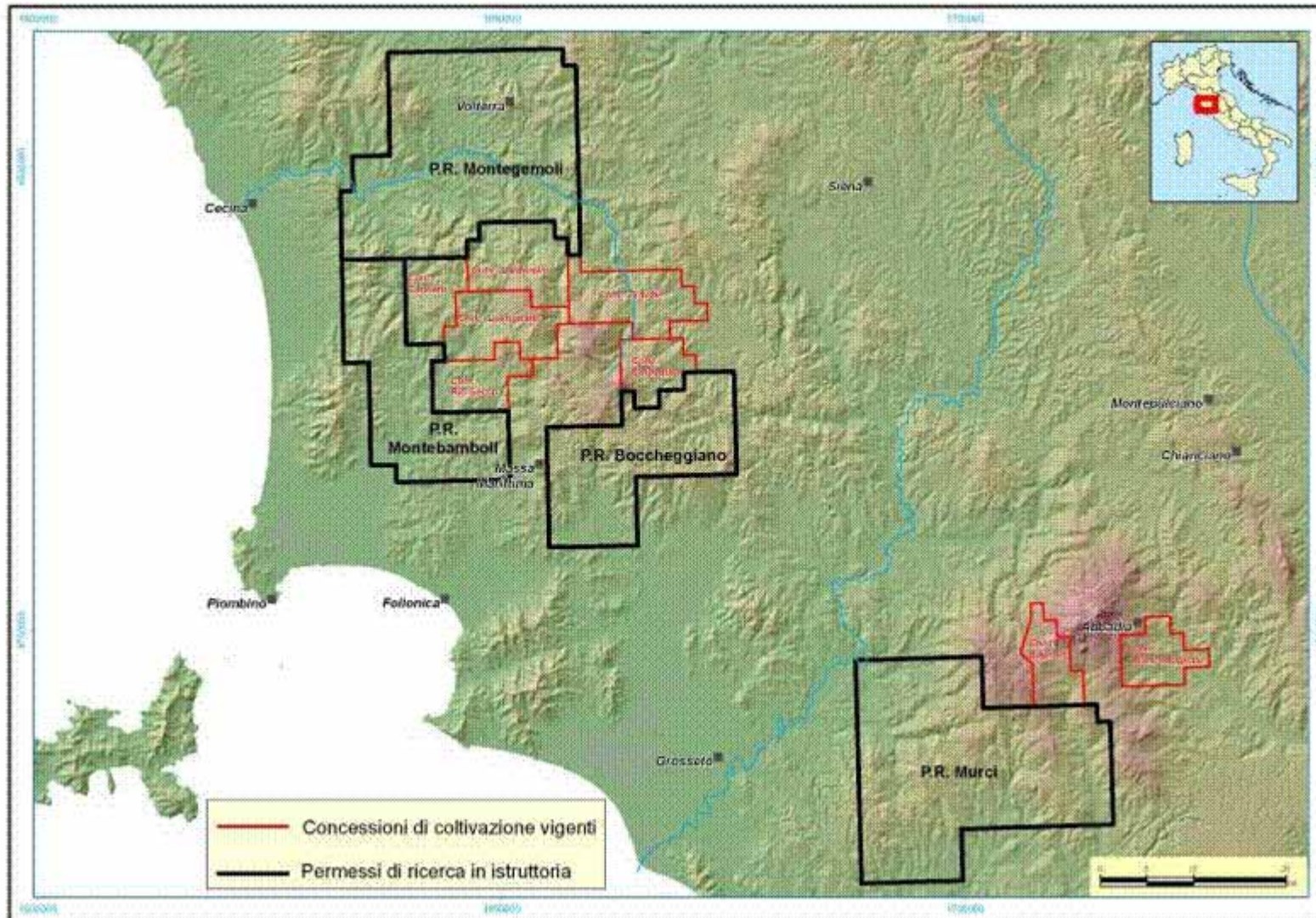


Complessità Crescente

- **Riduzione impatto visivo**
- **Trasporto del condensato**
- **Trasporto del fluido necessario per trattamento**



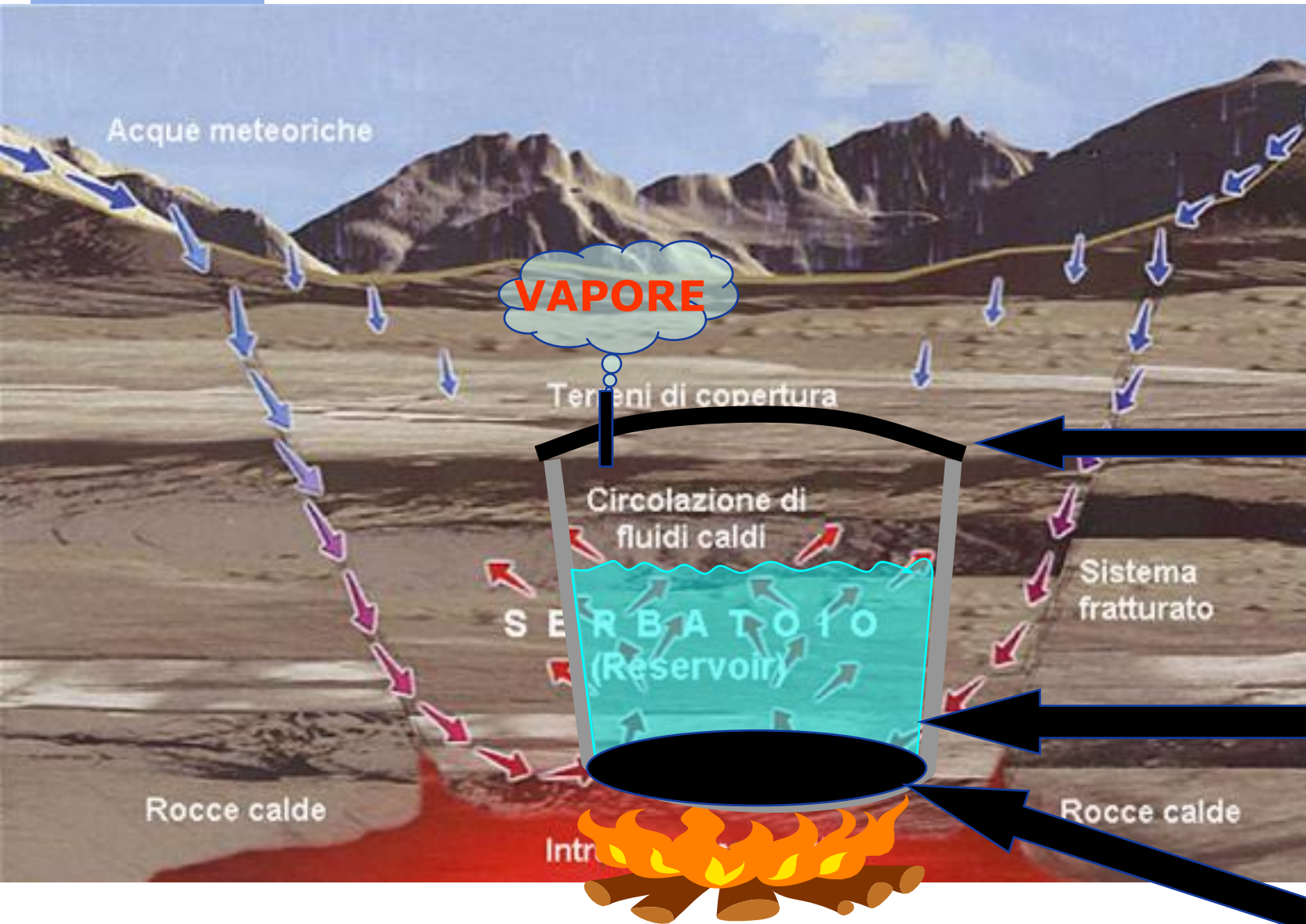
2010 Mondo geotermico: Italia



Nuovi permessi
per impianti binari



Sistemi geotermici



Copertura impermeabile

Serbatoio:

Fluido inserito in roccia porosa e fratturata

Basamento impermeabile



Sistemi geotermici



Geyser - Iceland



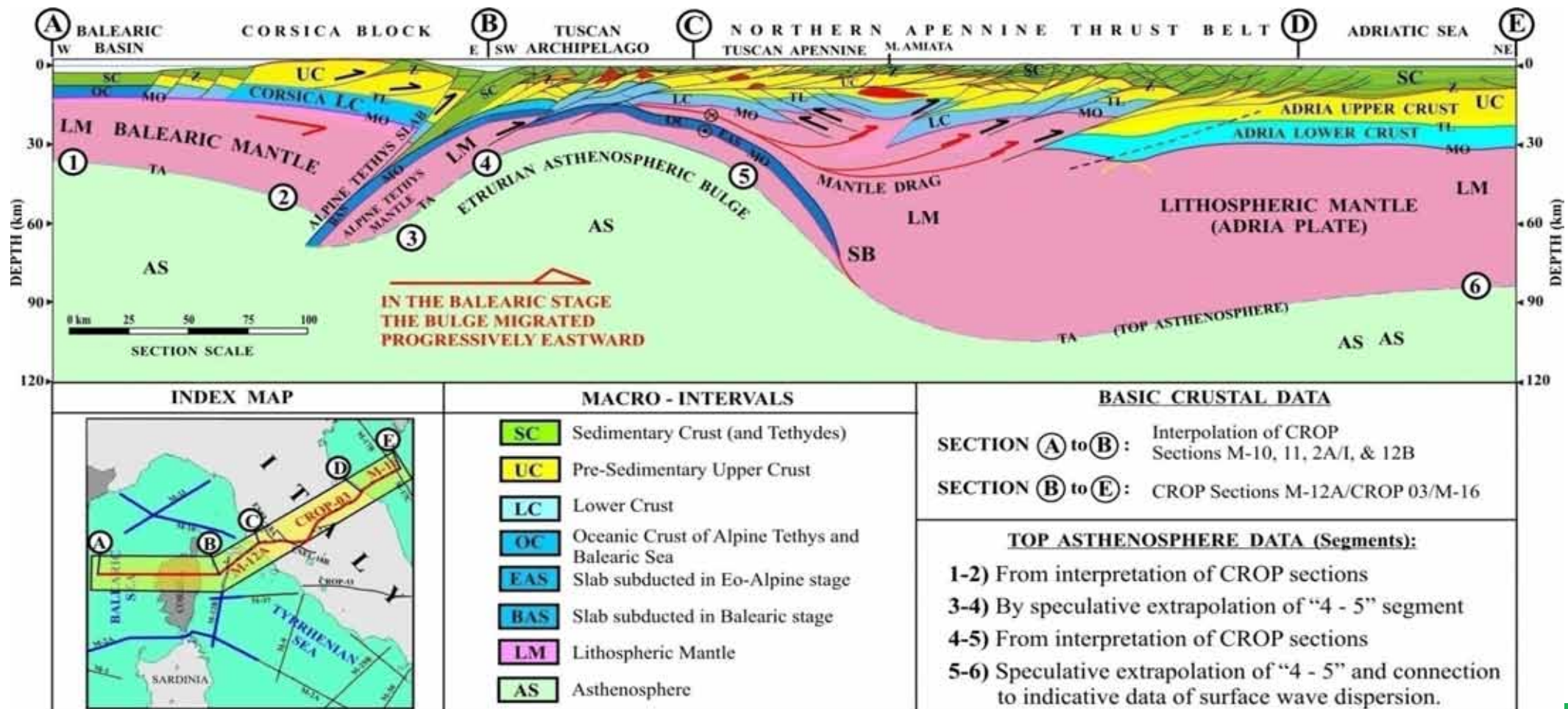
Boiling spring - USA

Sistemi geotermici

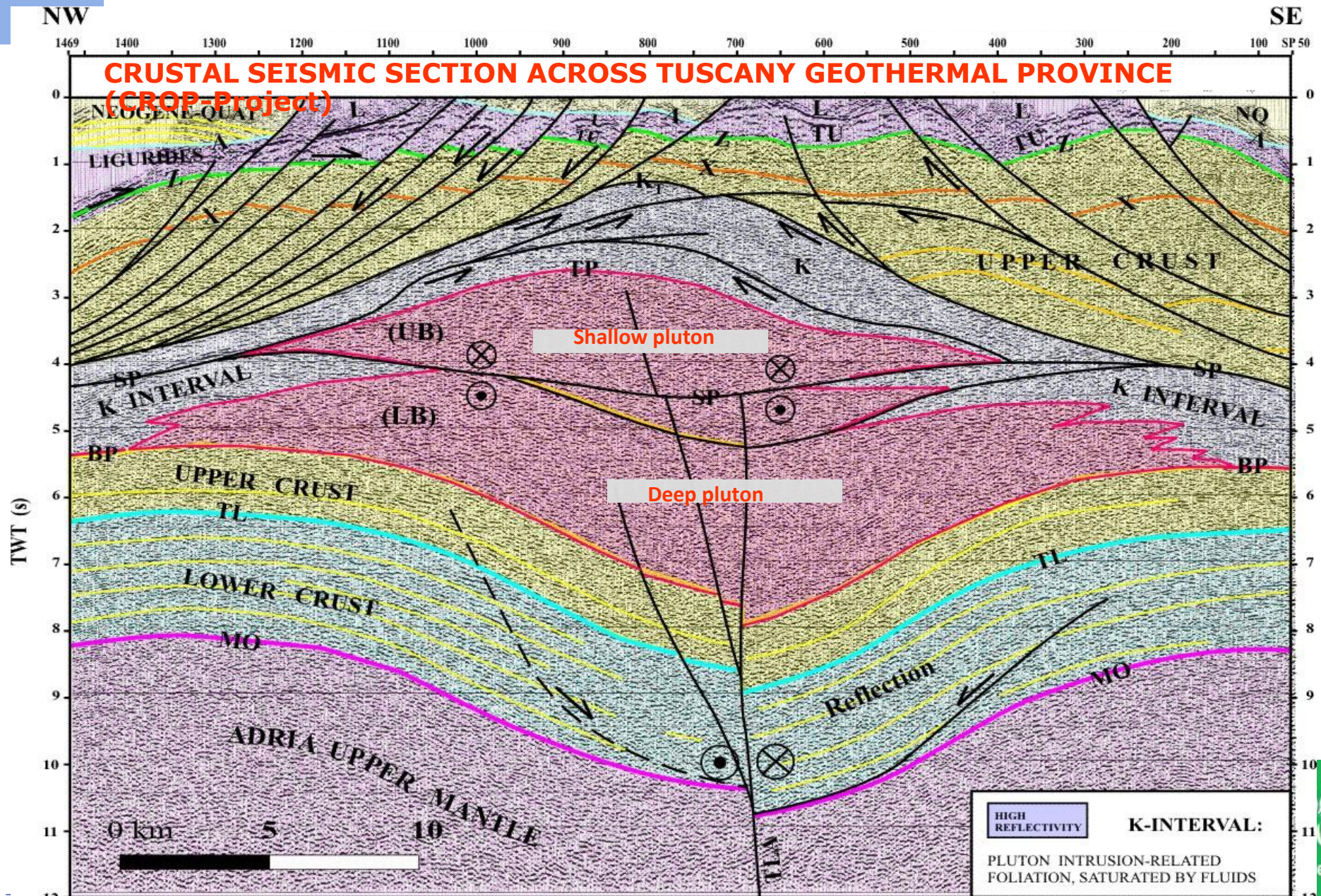


El Tatio- Chile

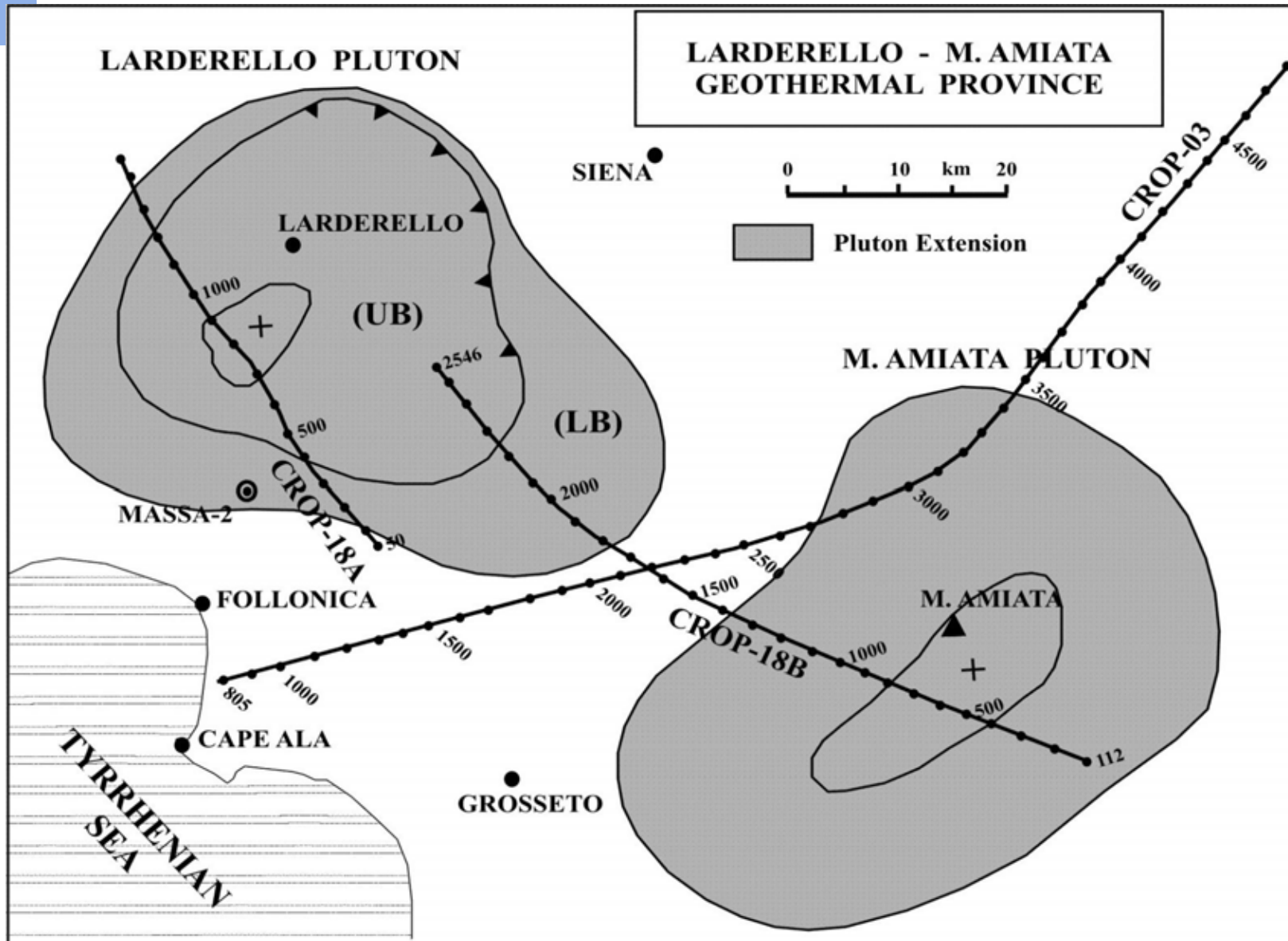
2010 Mondo geotermico: Italia



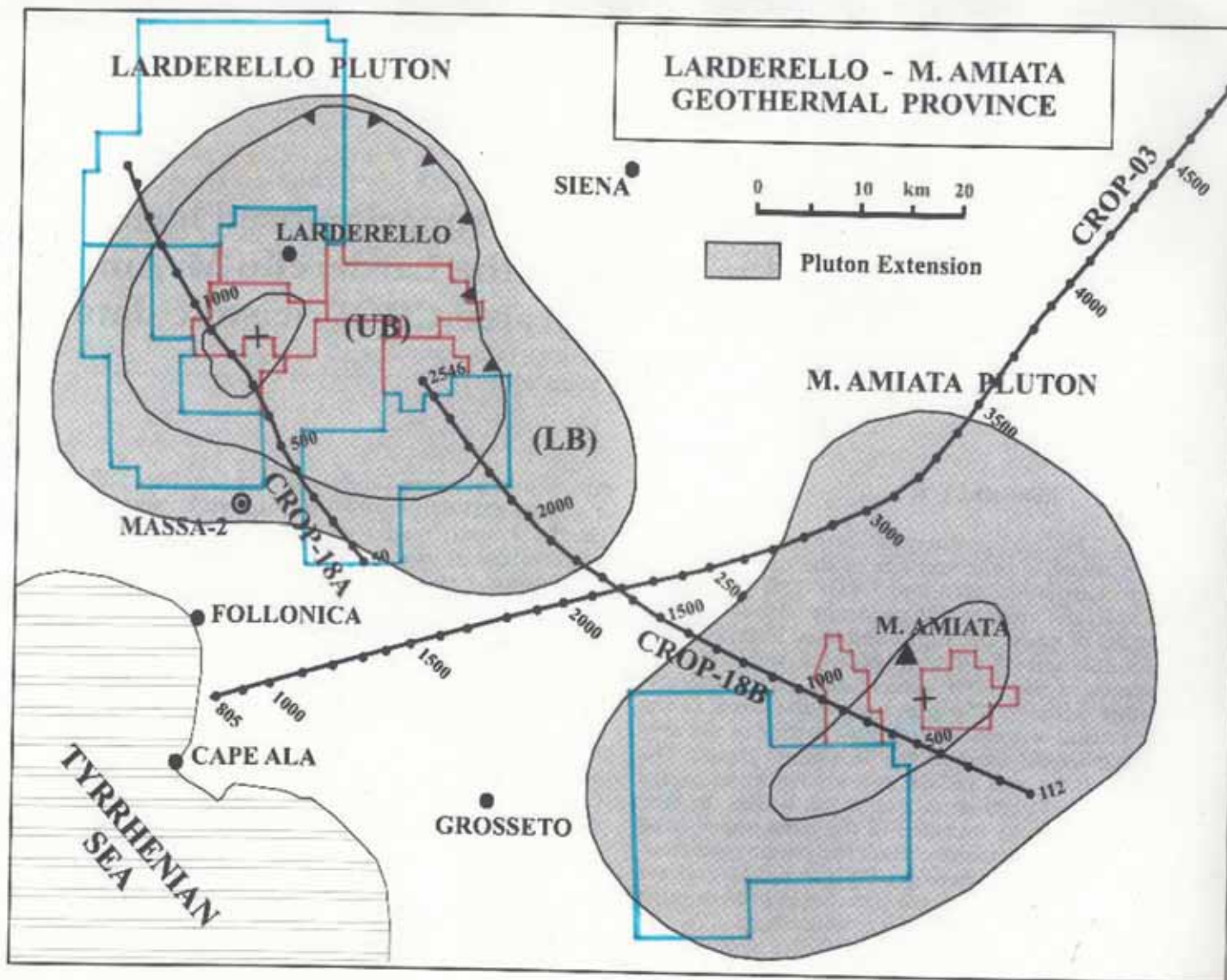
2010 Mondo geotermico: Italia



2010 Mondo geotermico: Italia

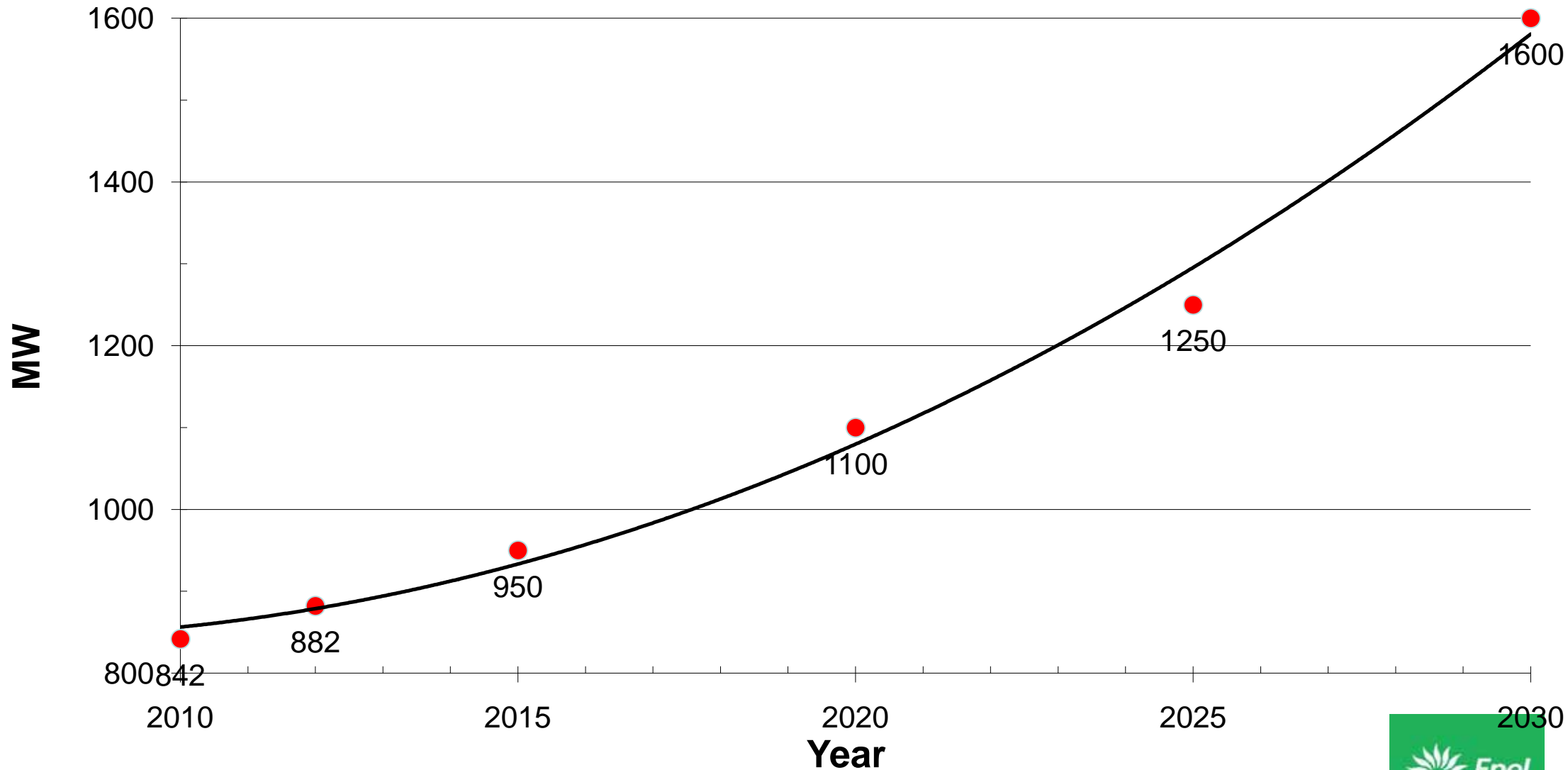


2010 Mondo geotermico: Italia



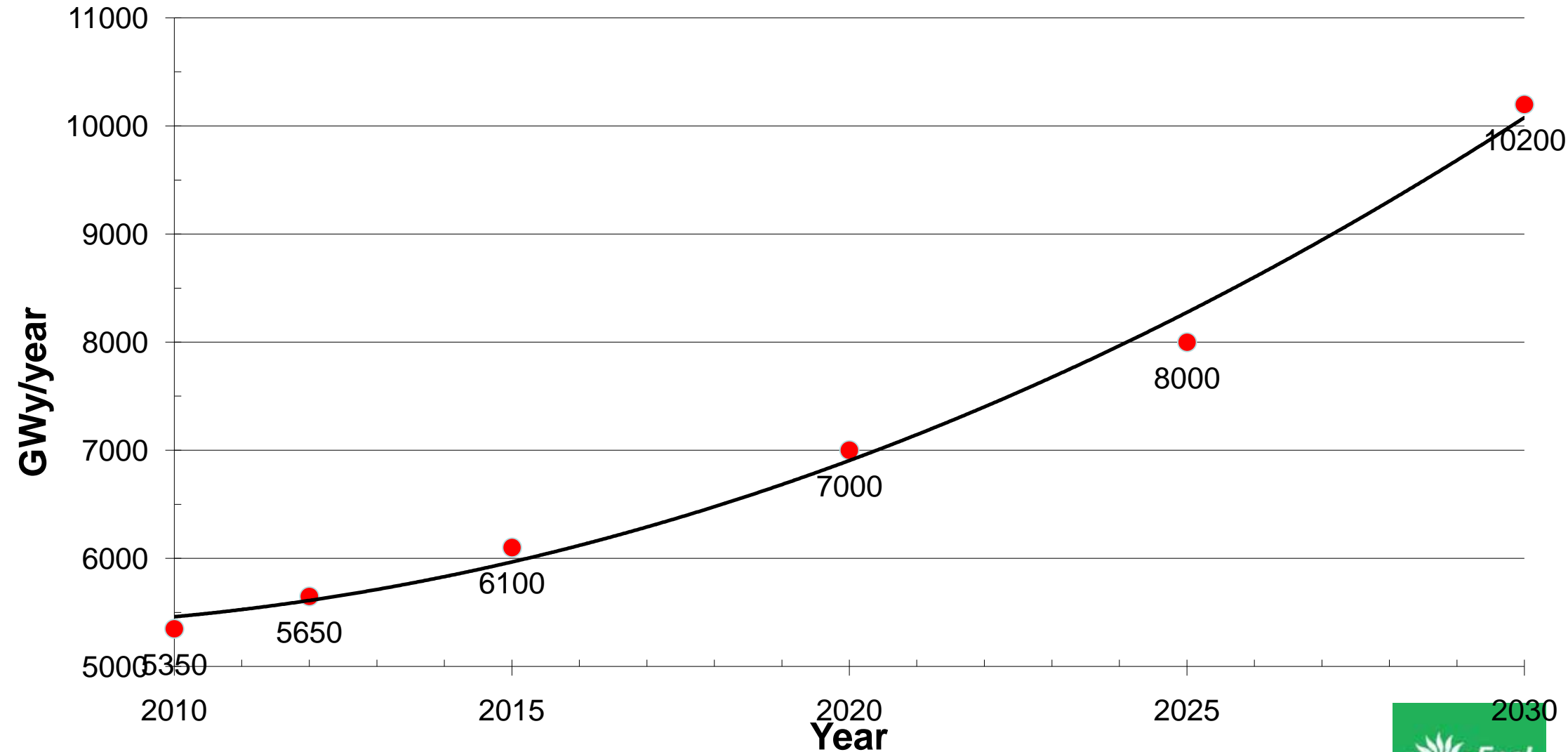
2010/30 Mondo geotermico: Italia

UGI forecasting of Installed Capacity



2010/30 Mondo geotermico: Italia

UGI forecasting of Produced Electricity



2010/30 Mondo geotermico: Italia

2030

- **Total Capacity:** ~ **1.600 MWe**
- **Gross electricity:** ~ **10,2 TWh/year**
- **Net electricity:** ~ **9,8 TWh/year (5% parassitic)**
- **Oil Saving:** ~ **2.050 kTOE/year**
- **CO₂ avoided:** ~ **6.320 kTon/year**

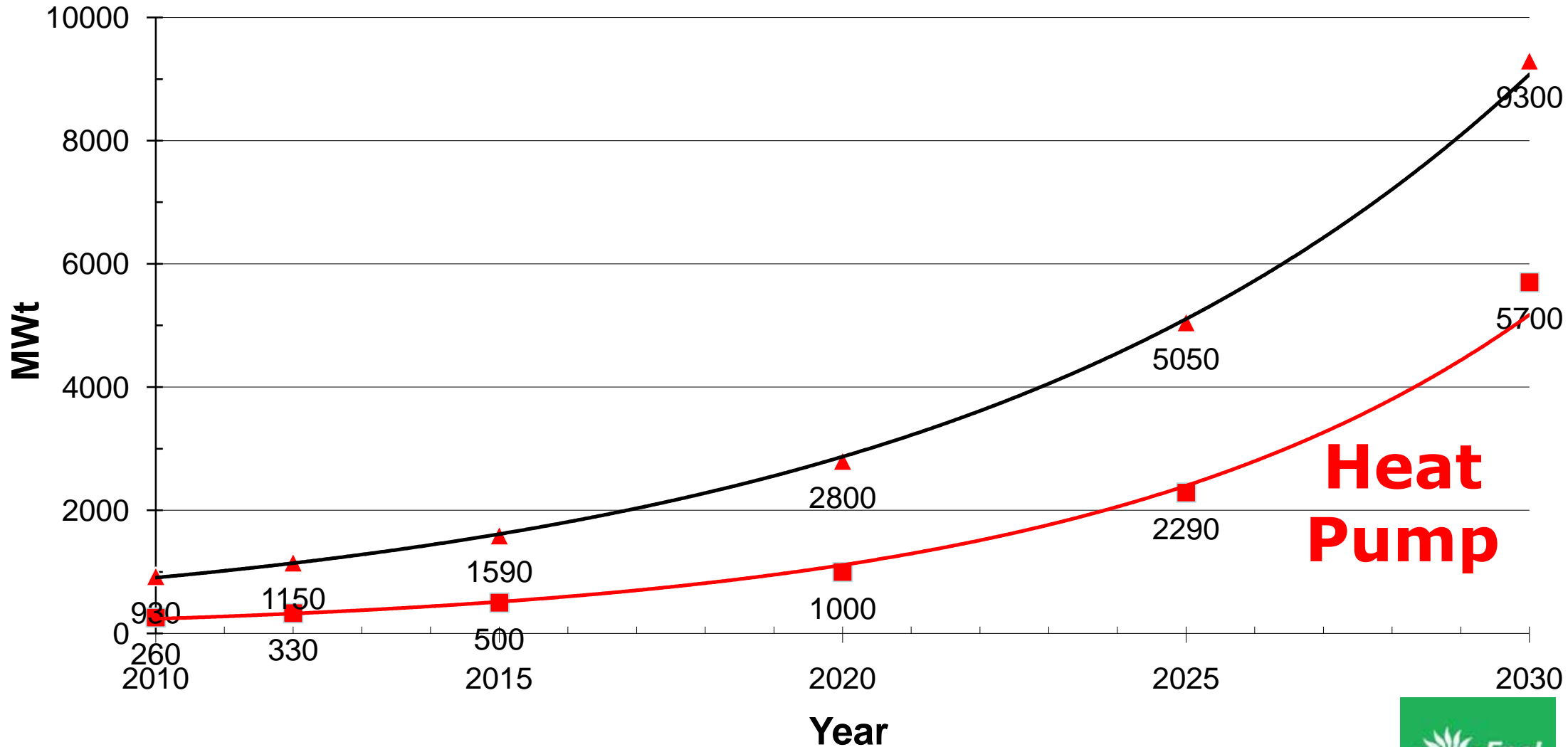
15-20% (300 MWe) da nuovi impianti binari, sia in toscana che in altre regioni, con 50 MW al 2020.

Le tecnologie non-convenzionali (EGS, supercritical fluids, pressurized systems, magmatic systems) possono essere stimate come un contributo del 25% .



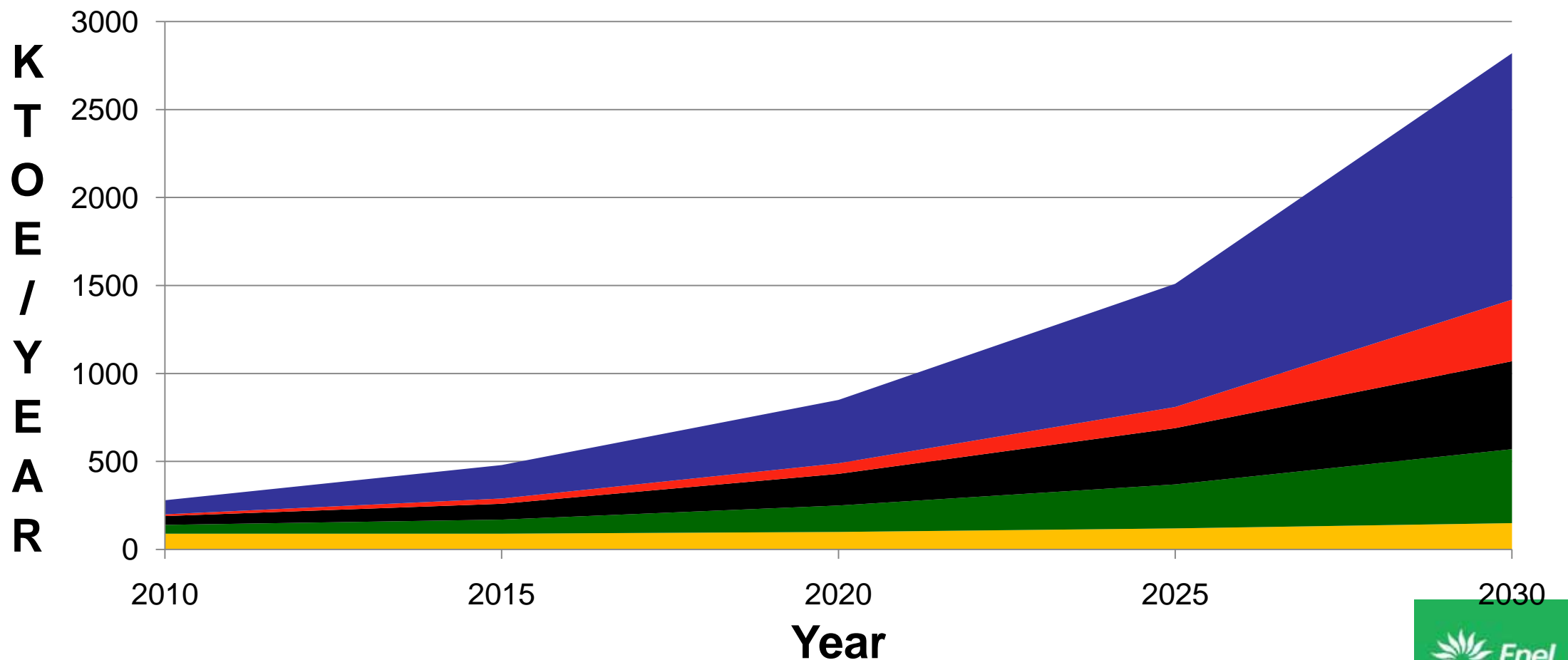
2010/30 Mondo geotermico: Italia (Calore)

UGI forecasting of Installed Capacity



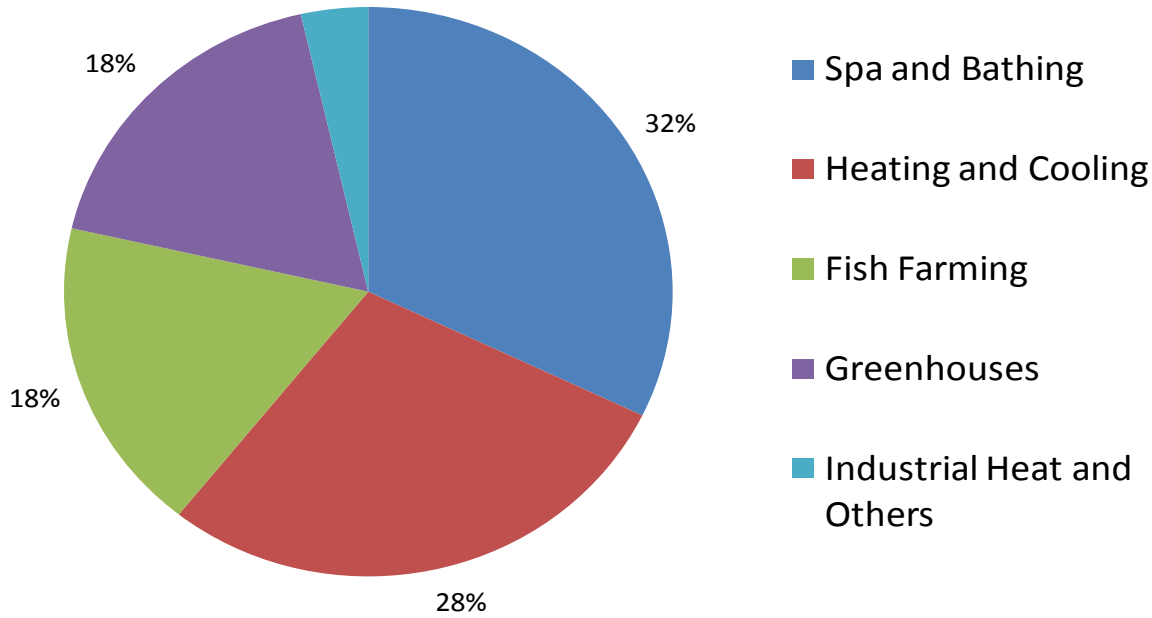
2010/30 Mondo geotermico: Italia (Calore)

- Heating and Cooling
- Industrial Heat and Others
- Greenhouses
- Fish Farming
- Spa and Bathing

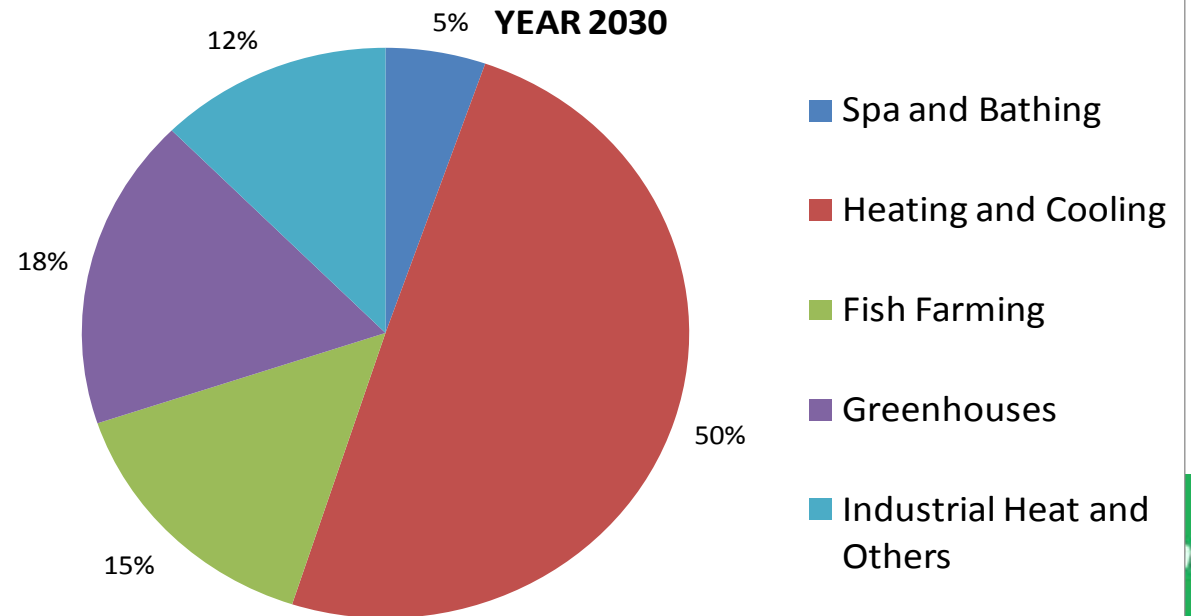


2010/30 Mondo geotermico: Italia (Calore)

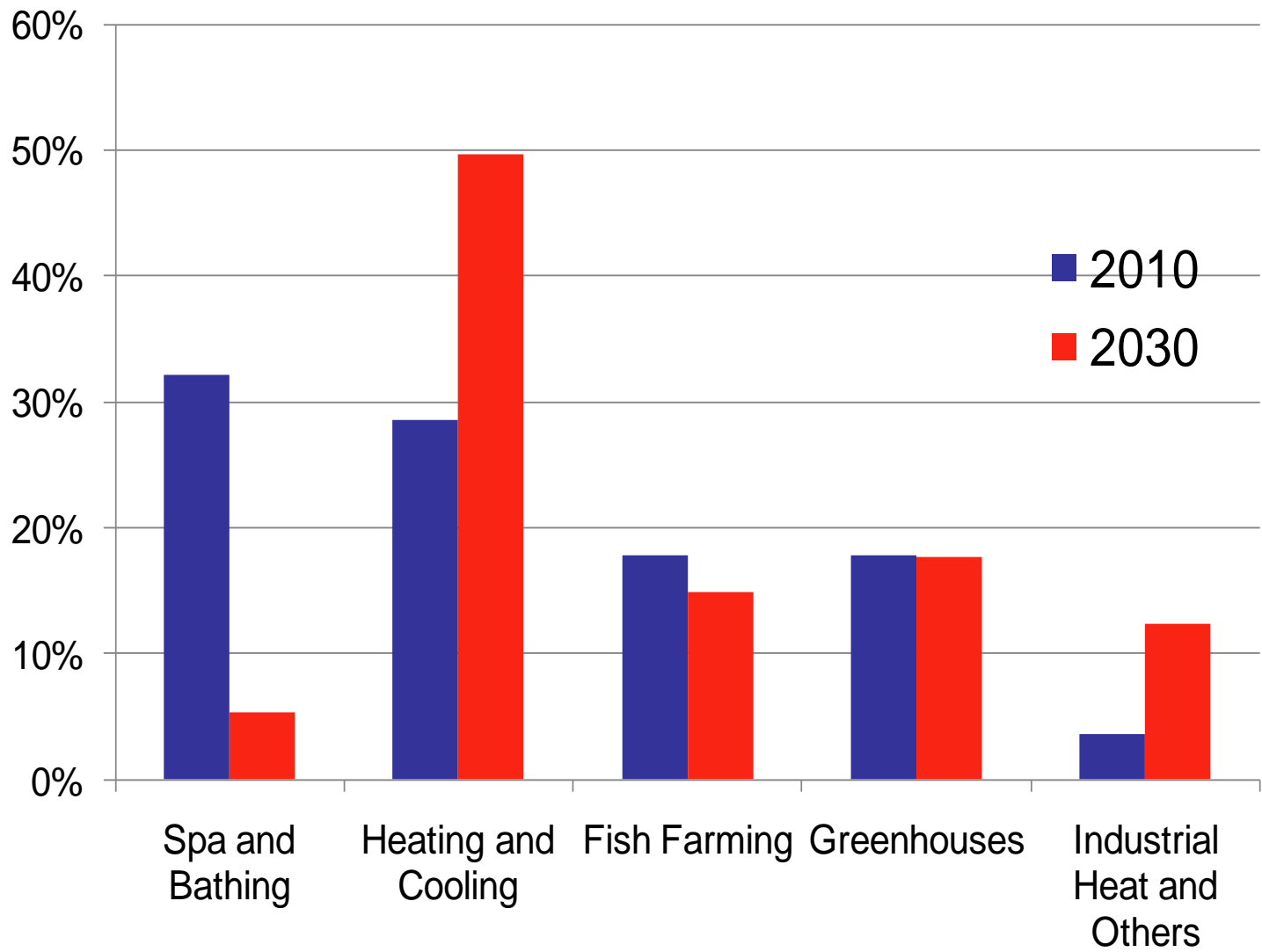
YEAR 2010



YEAR 2030



2010/30 Mondo geotermico: Italia (Calore)



2010/30 Mondo geotermico: Italia (Calore)

2030

TOTAL

- Total Capacity: ~ 9.300 MWt
- Produced Heat: ~ 118.070 TJ/year
- Oil Saving: ~ 2.820 kTOE/year
- CO₂ avoided: ~ 8.500 kTon/year

HEAT PUMP

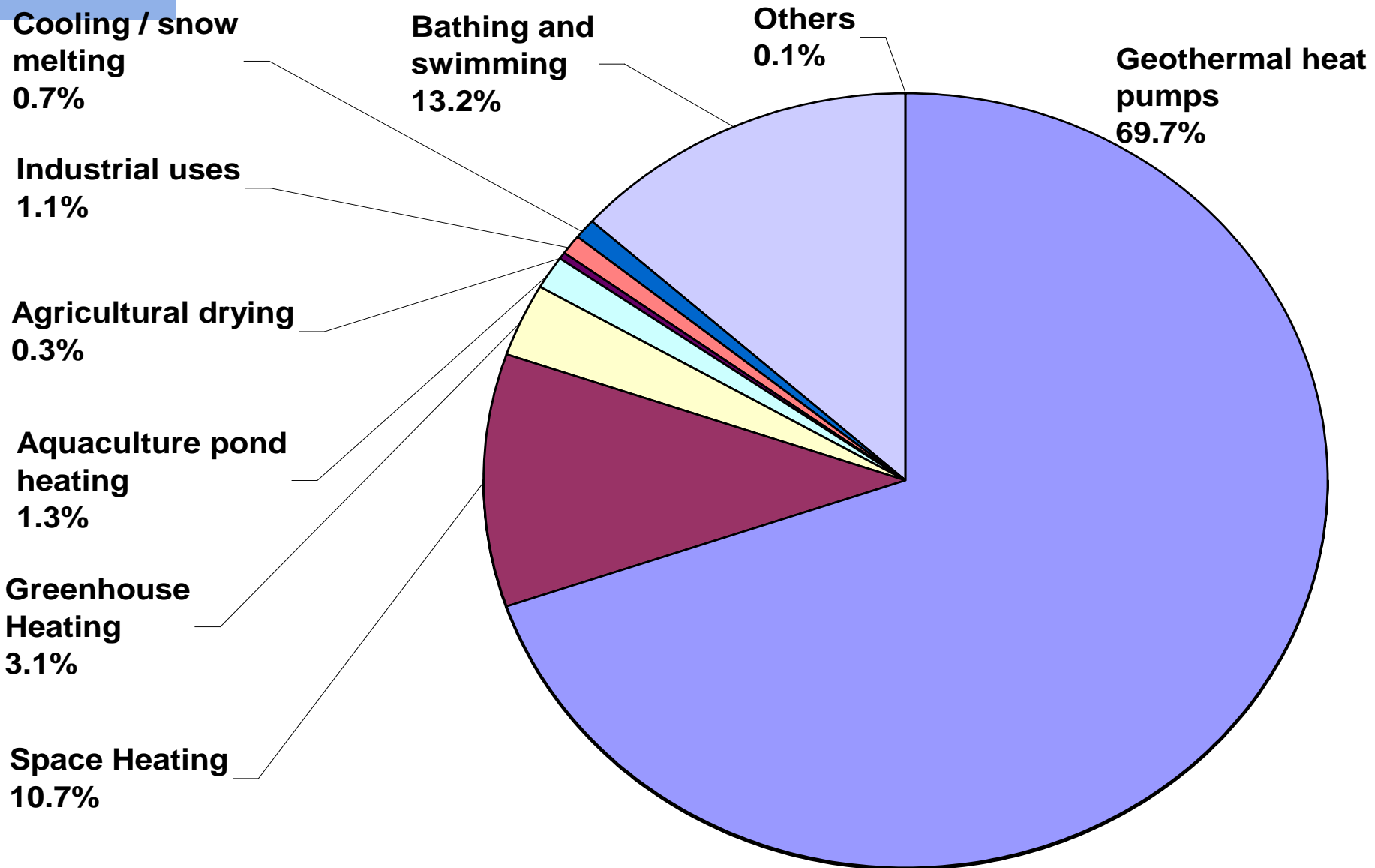
- Total Capacity: ~ 5.700 MWt
- Produced Heat: ~ 24.100TJ/year
- Oil Saving: ~ 575 kTOE/year
- CO₂ avoided: ~ 1.730 kTon/year

OTHER

- Total Capacity: ~ 3.600 MWt
- Produced Heat: ~ 93.970 TJ/year
- Oil Saving: ~ 2.245 kTOE/year
- CO₂ avoided: ~ 6.770 kTon/year

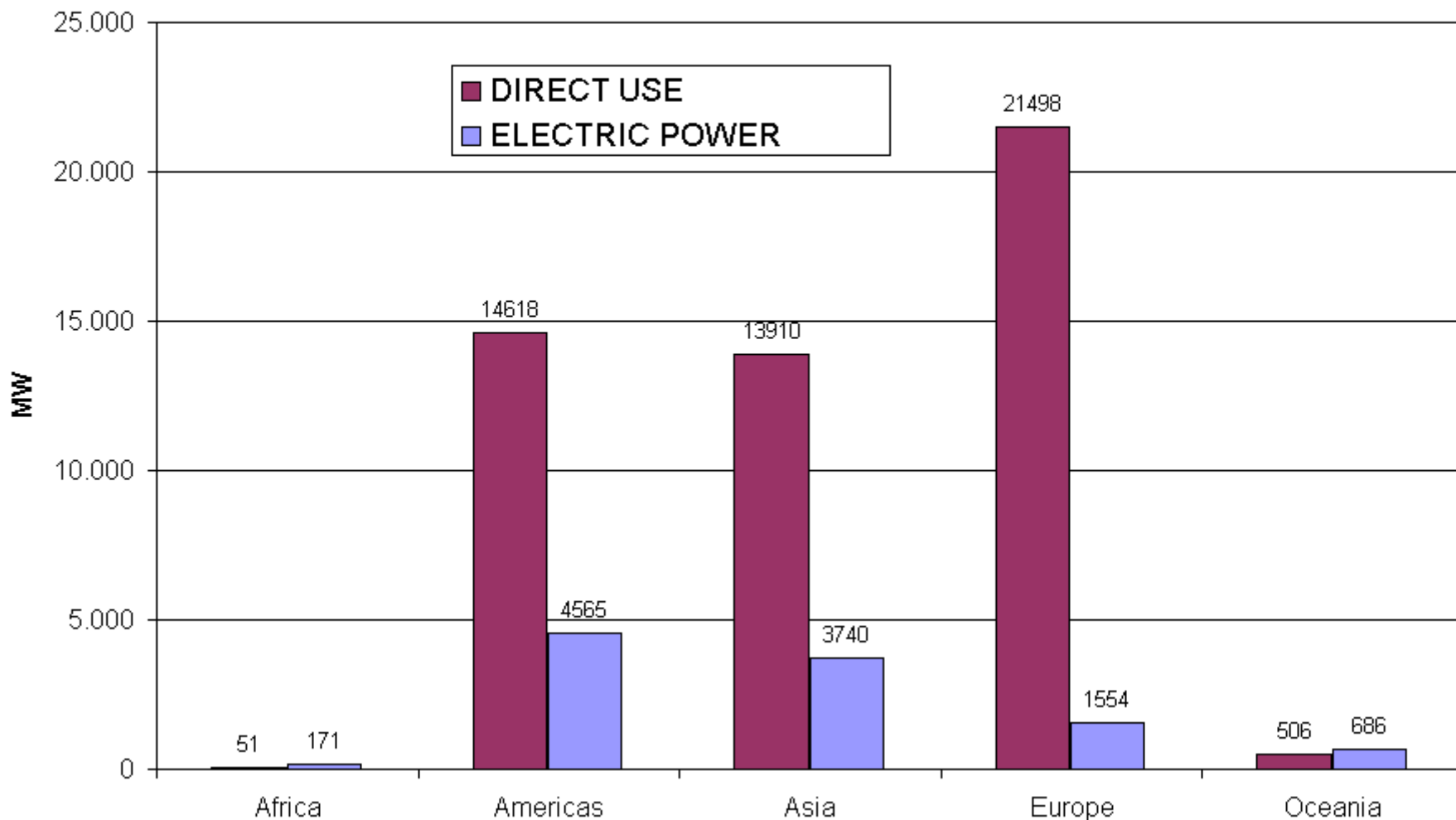


2010 Mondo geotermico: Calore



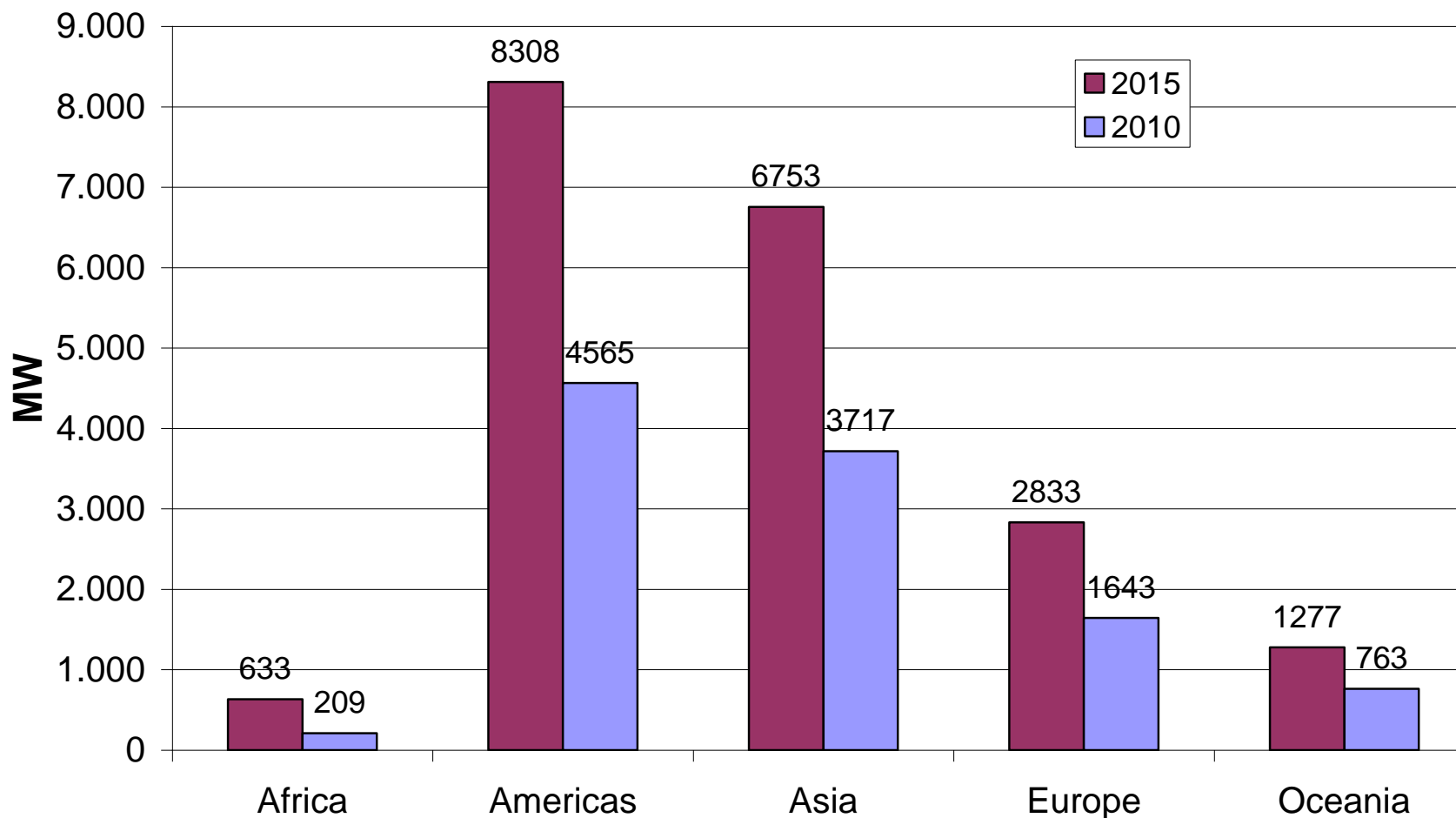
2010 Mondo geotermico: Elettricità & Calore

Installed Capacity



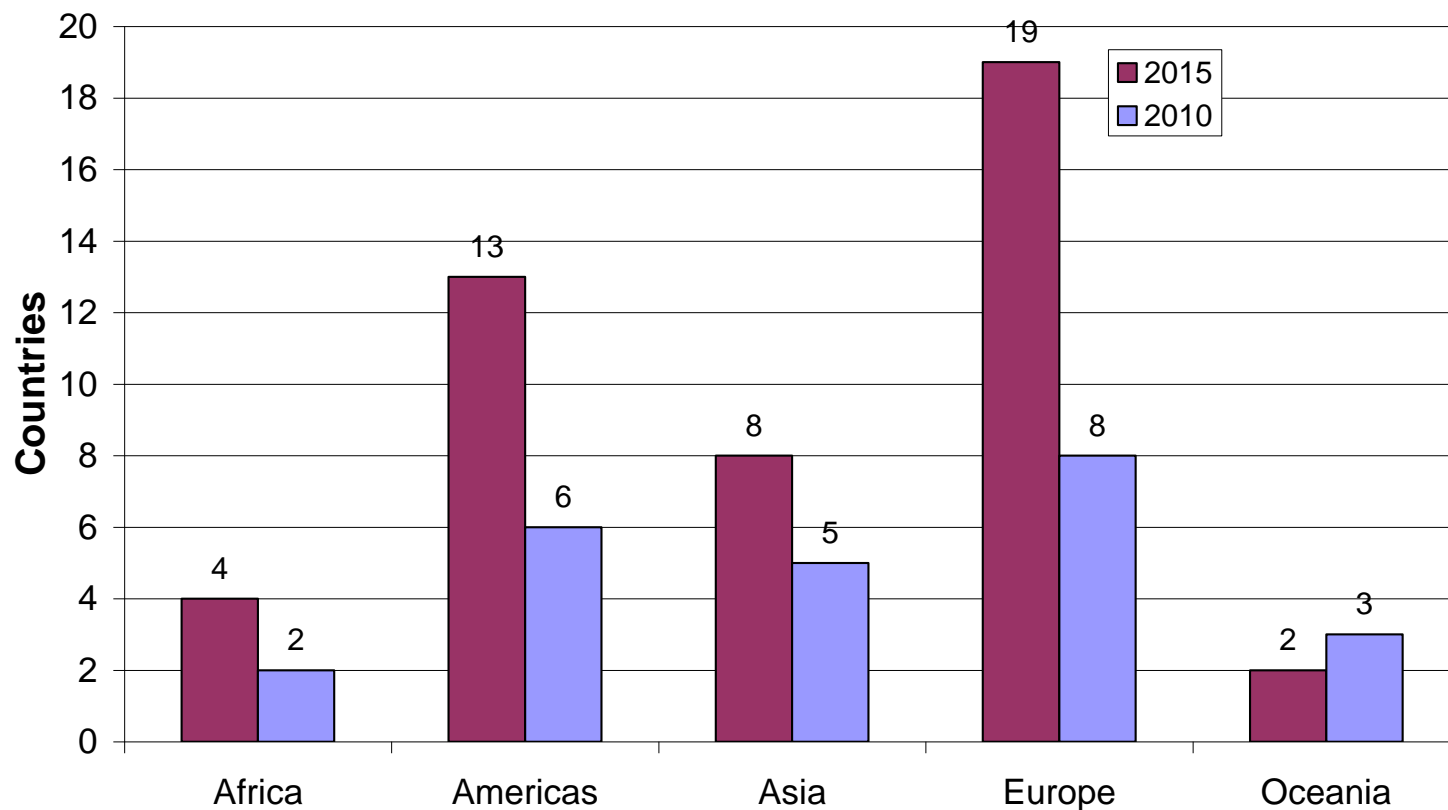
2010/15 Mondo geotermico: Continenti

Installed Capacity



2010/15 Mondo geotermico: Continenti

Number of Countries



2015 Mondo geotermico: 19,8 GW

EUROPE: from 1.6 to 2.8 GW

AUSTRIA	6 MW	POLAND	1 MW
CZECH REP	5 MW	PORTUGAL	60 MW
FRANCE	41 MW	ROMANIA	5 MW
GERMANY	15 MW	RUSSIA	194 MW
GREECE	18 MW	SLOVAKIA	5 MW
HUNGARY	5 MW	SPAIN	40 MW
ICELAND	1285 MW	SWITZERLAND	3 MW
ITALY	923 MW	THE NETHERLAND	5 MW
LATVIA	3 MW	TURKEY	206 MW
		UK	13 MW

ASIA: from 3.7 to 6.8 GW

ARMENIA	25 MW
CHINA	64 MW
INDONESIA	3451 MW
IRAN ISL.REP	50 MW
JAPAN	568 MW
PAPUA-NEW GUINEA	75 MW
PHILIPPINES	2519 MW
THAILAND	1 MW

AMERICA: from 4.6 to 8.3 GW

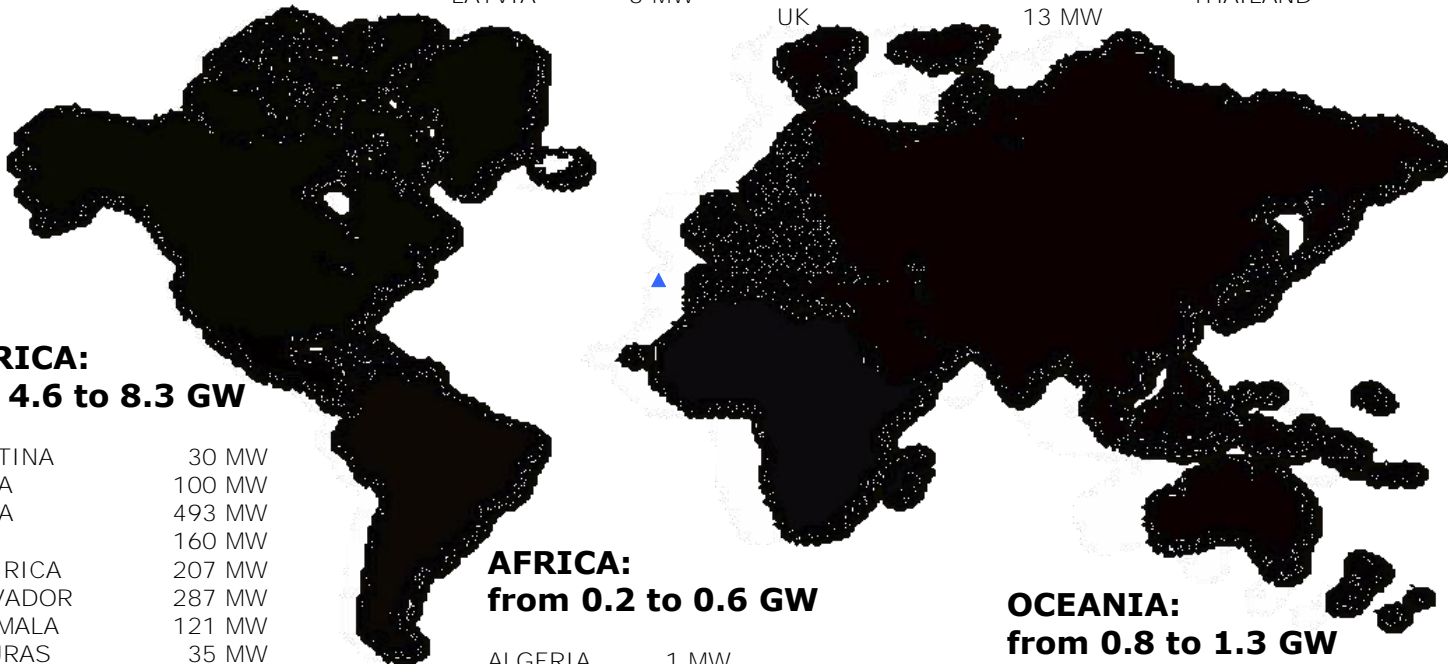
ARGENTINA	30 MW
BOLIVIA	100 MW
CANADA	493 MW
CHILE	160 MW
COSTA RICA	207 MW
EI SALVADOR	287 MW
GUATEMALA	121 MW
HONDURAS	35 MW
MEXICO	1115 MW
NEVIS	35 MW
NICARAGUA	248 MW
PERU	40 MW
USA	5437 MW

AFRICA: from 0.2 to 0.6 GW

ALGERIA	1 MW
DJIBUTI	50 MW
ETHIOPIA	47 MW
KENYA	534 MW

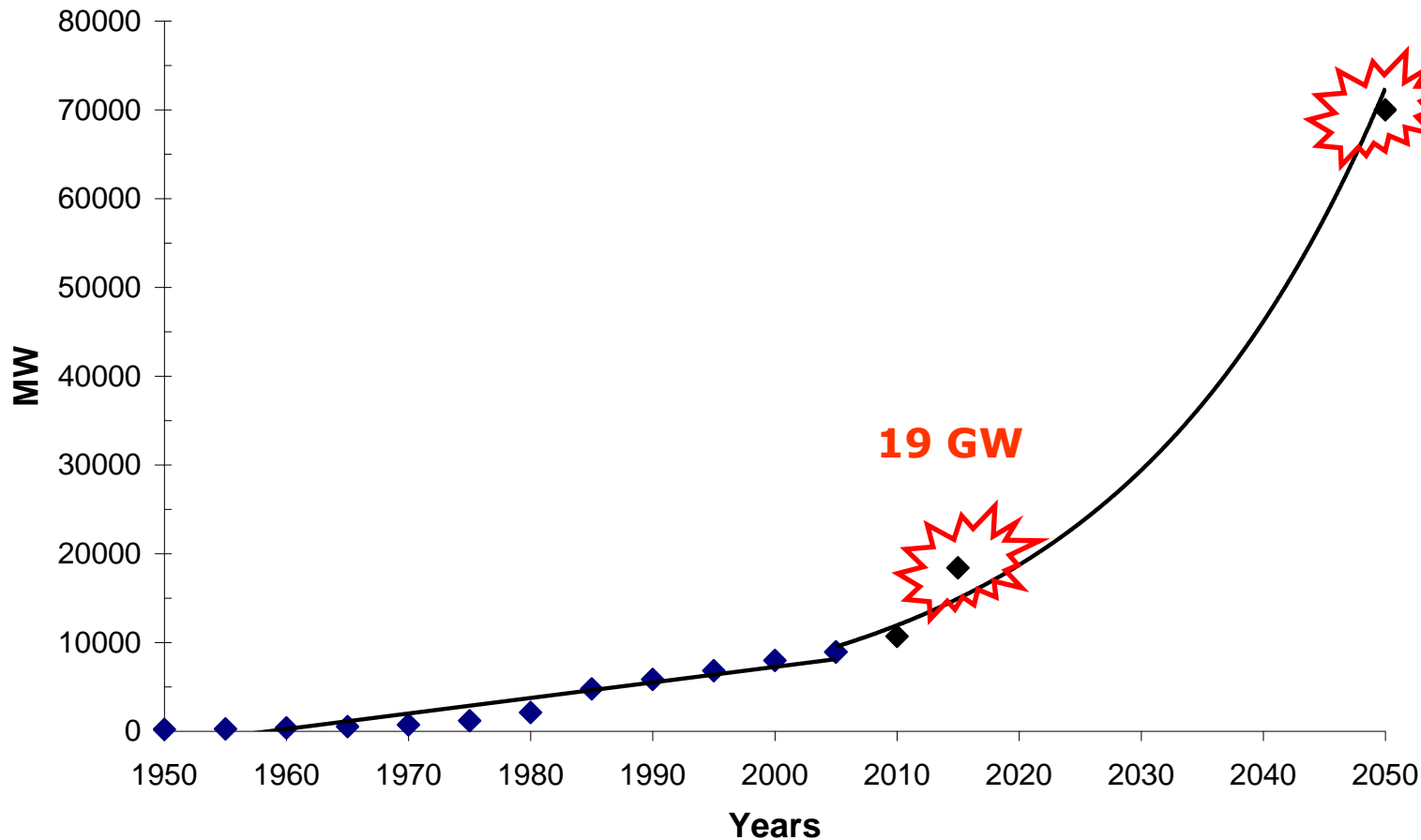
OCEANIA: from 0.8 to 1.3 GW

AUSTRALIA	40 MW
NEW ZEALAND	1237 MW



2050 Mondo geotermico: 70 GW idrotermali

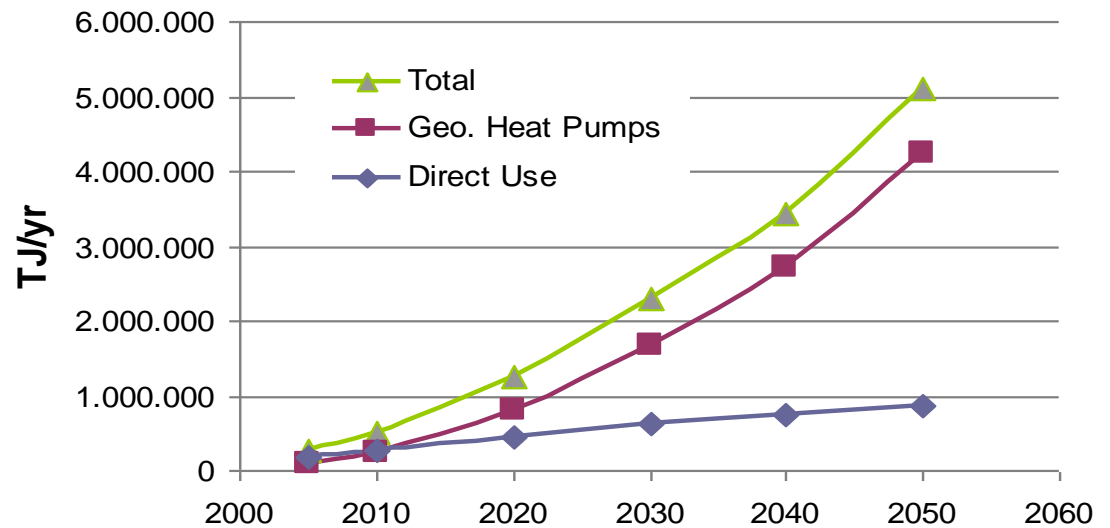
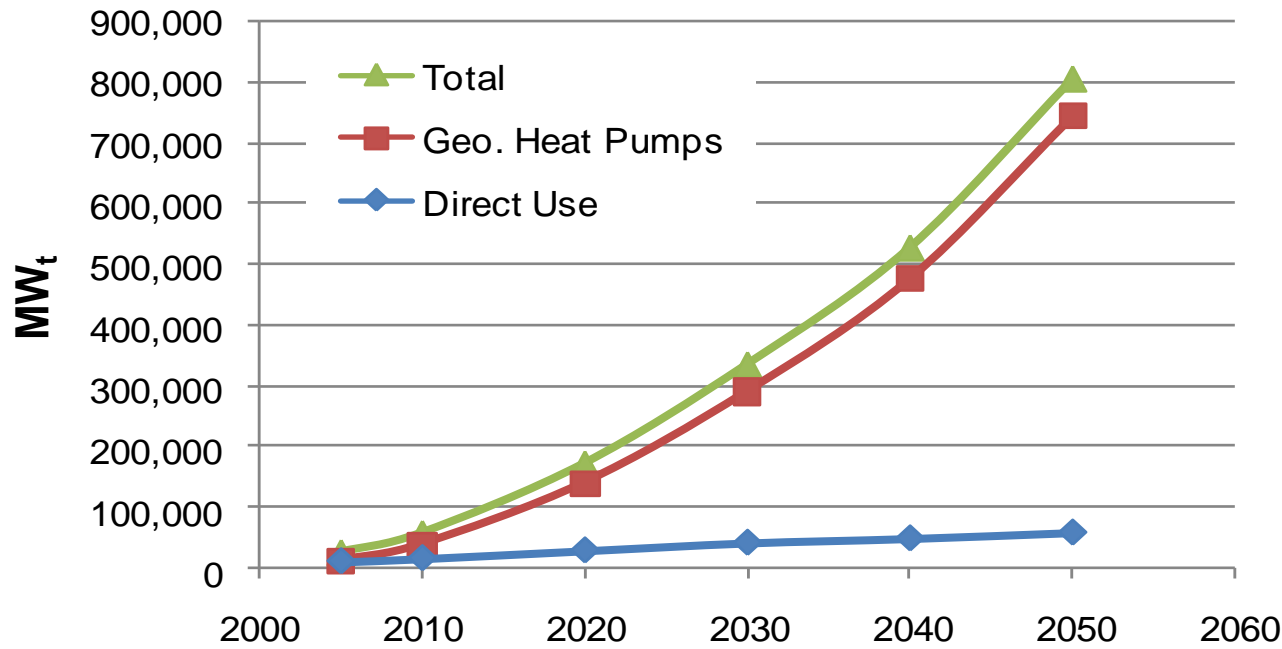
World Geothermal Electricity



**Il valore di
70 GW
(EGS senza EGS)
per il 2050 è
comunque
ambizioso**



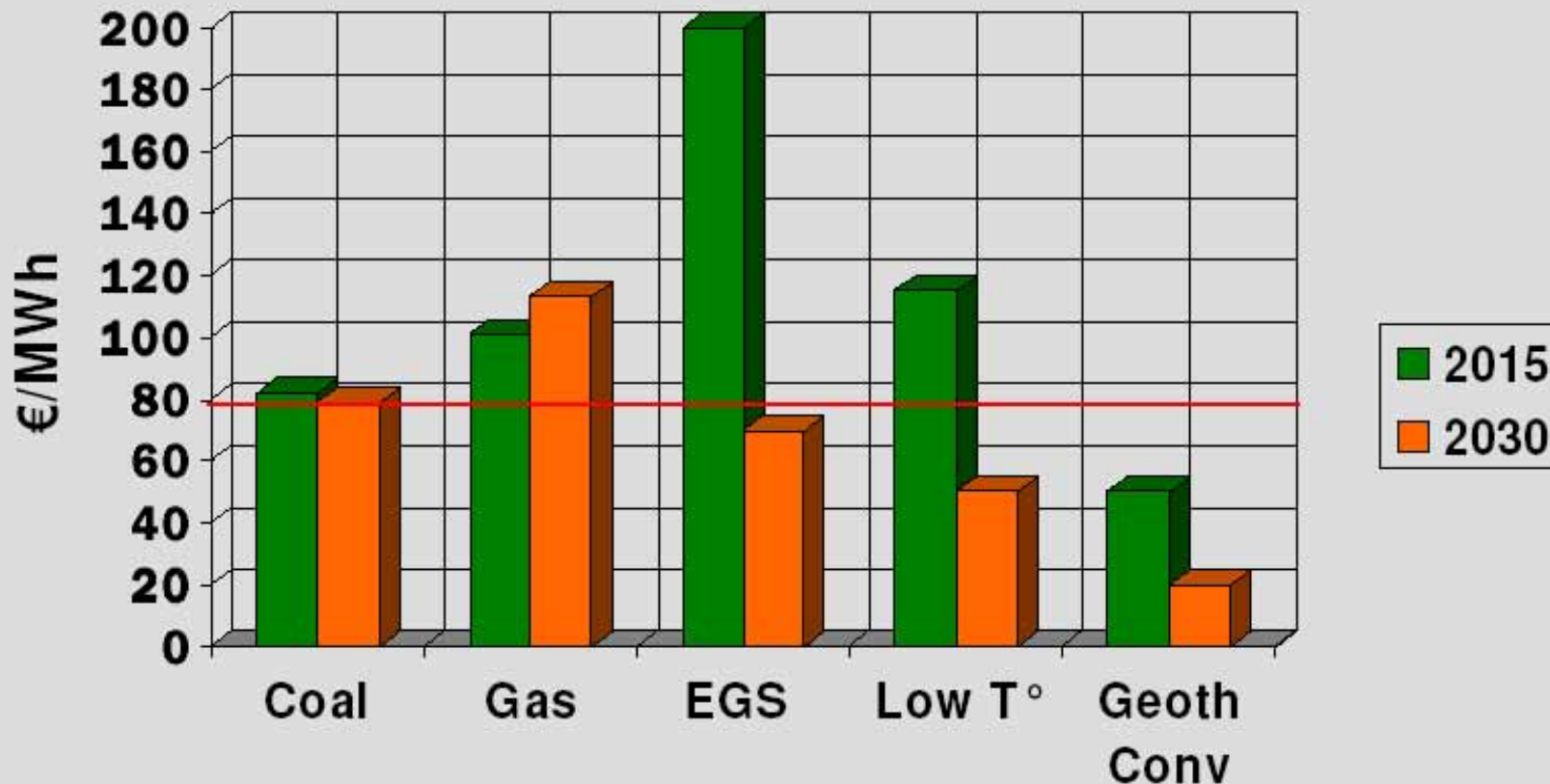
2050 Mondo geotermico: Calore



2015/30 Europa geotermica



R&D to decrease geothermal costs Electricity Generating Cost in EU – 2015 and 2030



2010/50 Europa geotermica

EU27 - Geothermal Power Installed Capacity (2007-2050)

Geothermal Electricity (MW)	2007	2010	2020	2030	2050
Electricity Conventional	815	920	1,200	2,000	2,500
Electricity Low Temperature	15	70	300	5,000	7,500
Electricity EGS	-	10	4,500	15,000	90,000
Total Installed Capacity	830	990-1,000	1,500-6,000	7,000-21,000	10,000-100,000
Yearly Electricity Production (TWh)	6.5	8.0	50.0	234	780

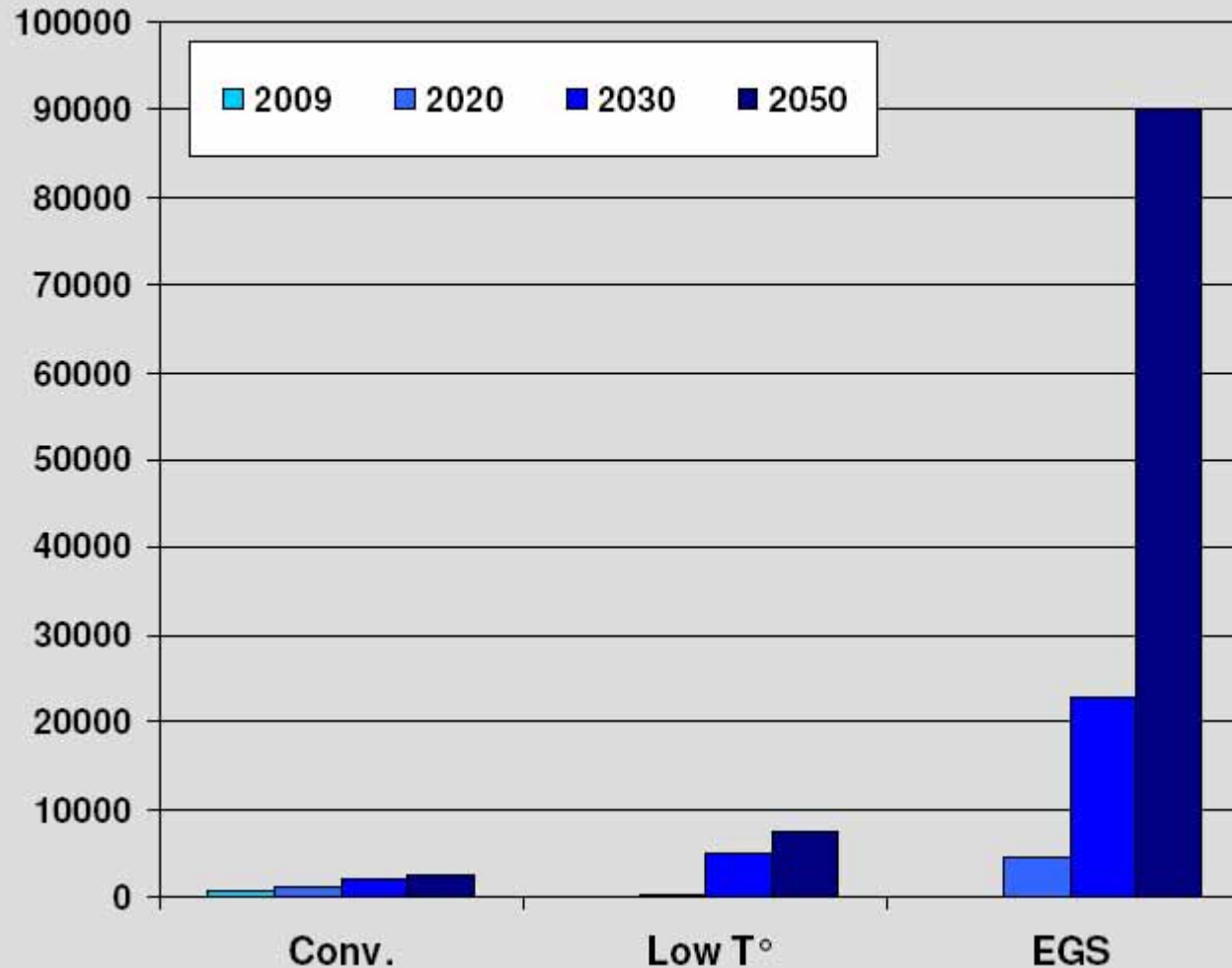
Tecnologia attuali

EGS è ancora pre-industriale

2010/50 Europa geotermica

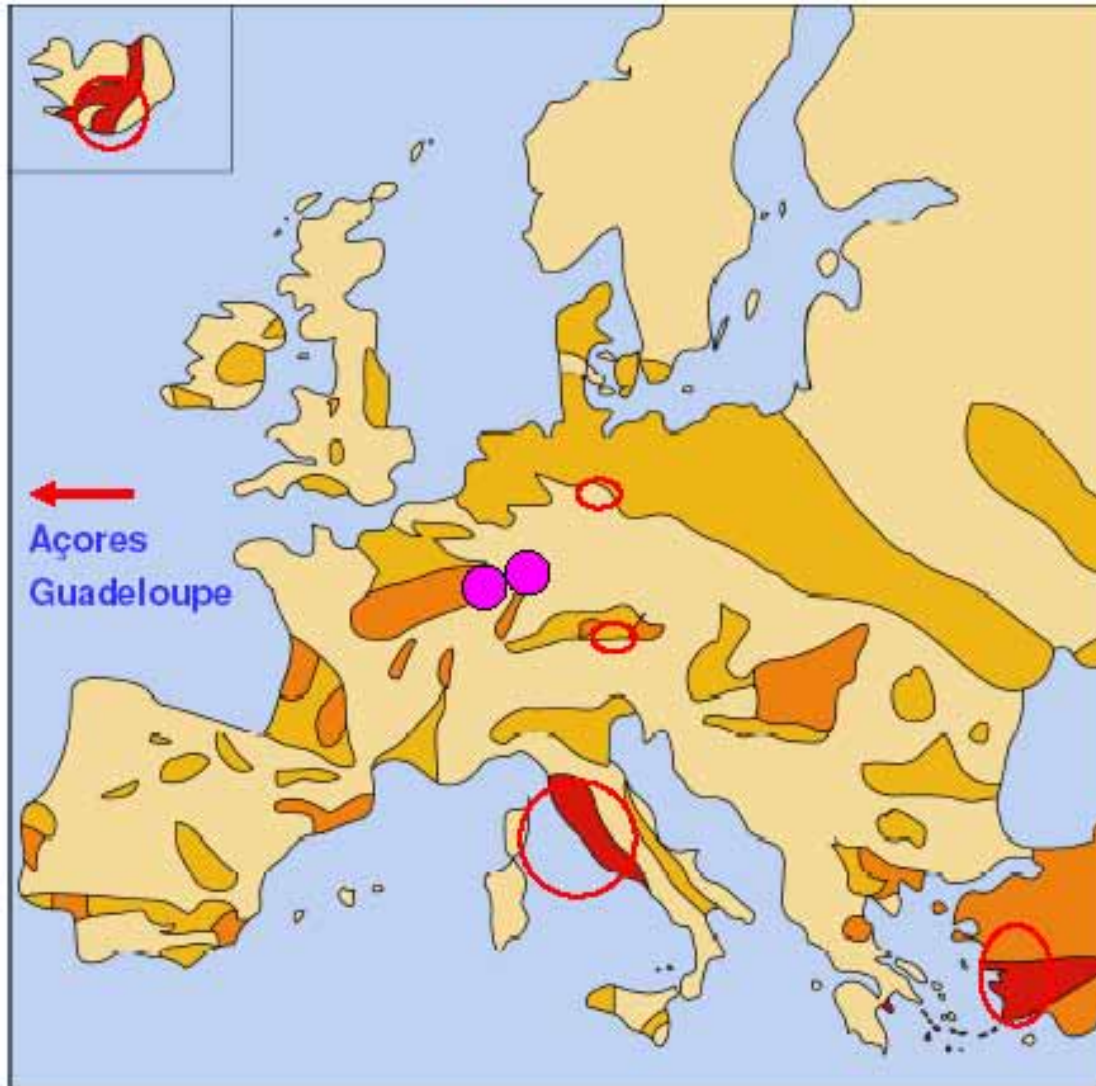


Geothermal Electric Power in EU - 2050



2010 Europa geotermica

From today....



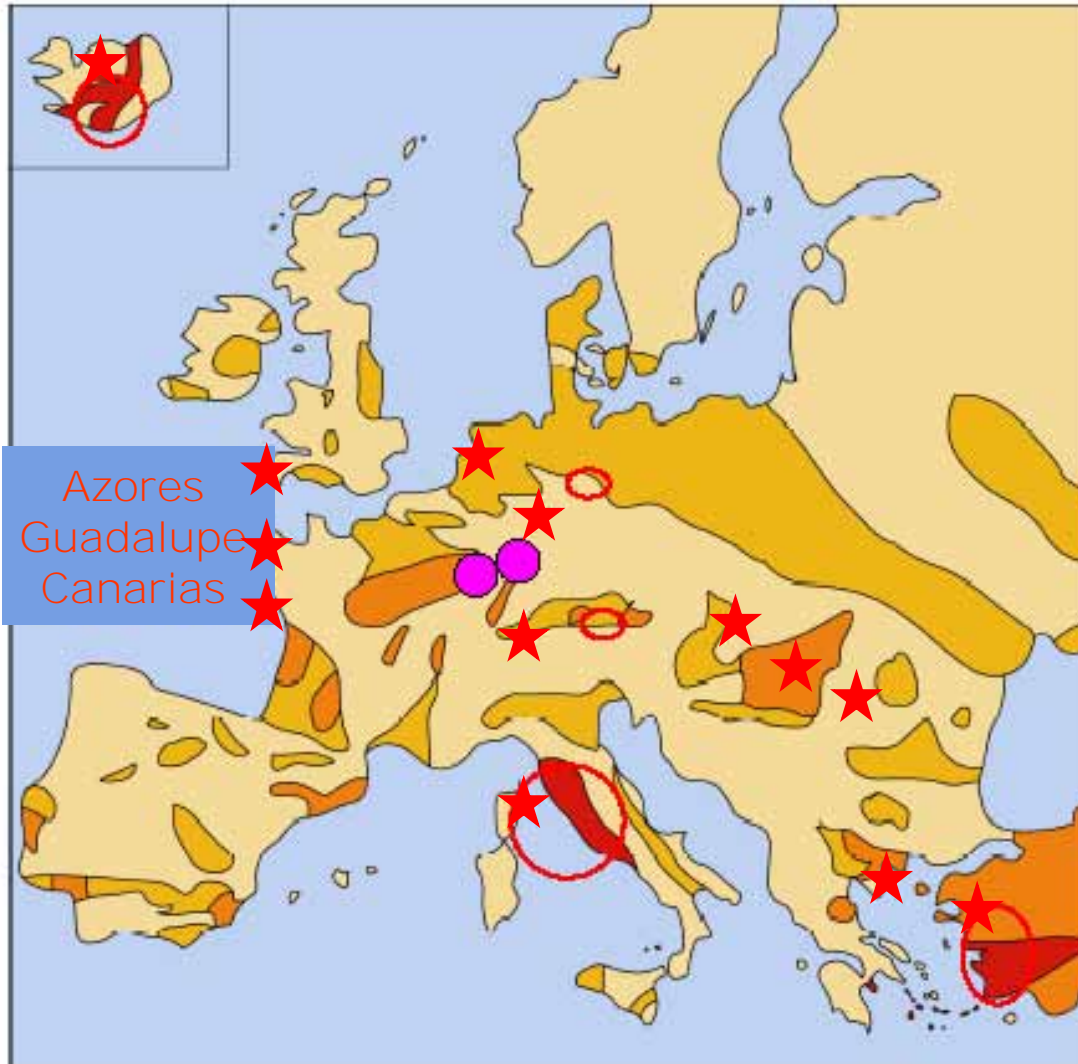
Geothermal electricity production and CHP in Europe, beginning of 2010

- Hydrothermal:
- Tuscany 843 + 100 MW
 - Iceland 575 MW
 - Turkey 90 MW
 - Azores 23 MW
 - Guadeloupe 15MW
 - Germany 5 MW
 - Austria 1 MW
- EGS: Sultz, Landau



2015 Europa geotermica

..to tomorrow..



Austria 5 MW
France 35 MW
Germany 15 MW
Greece 30 MW
Hungary 5 MW
Iceland 800 MW
Italy 920 MW
Netherlands 5 MW
Portugal 60 MW
Romania 5 MW
Slovakia 5 MW
Spain 40 MW
Turkey 200 MW



2050 Europa geotermica

The next future



New Geo-elec projects all over Europe (ca. 400 MWe)

- ★ Hydrothermal
- ★ EGS

2010-20 Europa geotermica

2010-2020

- **Sviluppo risorse idrotermali in aree tradizionali**
- **Sviluppo al di fuori di Europa per compagnie europee**
- **Sviluppo impianti binari (Pannonian basin)**
- **Combinazione bottom-cycle con impianti tradizionali**

2010-20 Europa geotermica

2010-2020

- **Sviluppo tecnologia EGS: altri siti, altre situazioni geologiche, miglioramento costi**
- **Sviluppo di un modello europeo EGS**
- **Sviluppo produzione combinata energia e calore**
- **Utilizzazione fonti ibride**
- **Gestione del rischio di sismicità indotta**



2010-20 Europa geotermica

2010-2020

Necessità di forti politiche di supporto

- Per la fase esplorativa
- Incentivi
- Politiche
- Regolatorio
- Tariffe
- Comunicazione
- Fase autorizzativa

2010-20 Europa geotermica

RICERCA

- **Identificazione risorsa**
 - Nuovi dati, reinterpretazione dati esistenti con nuove tecniche
 - Identificazione serbatoi profondi
 - Nuovi metodi geologici e geofisici
 - Resource assessment
- **Drilling**
 - Tecnologie innovative
 - Miglioramento costi
- **EGS:**
 - Esplorazione per identificazione siti
 - Reservoir engineering, stimolazione
 - Incremento efficienza in sfruttamento
 - Reservoir management

2020-30 Europa geotermica

2020-2030: verso una fonte competitiva

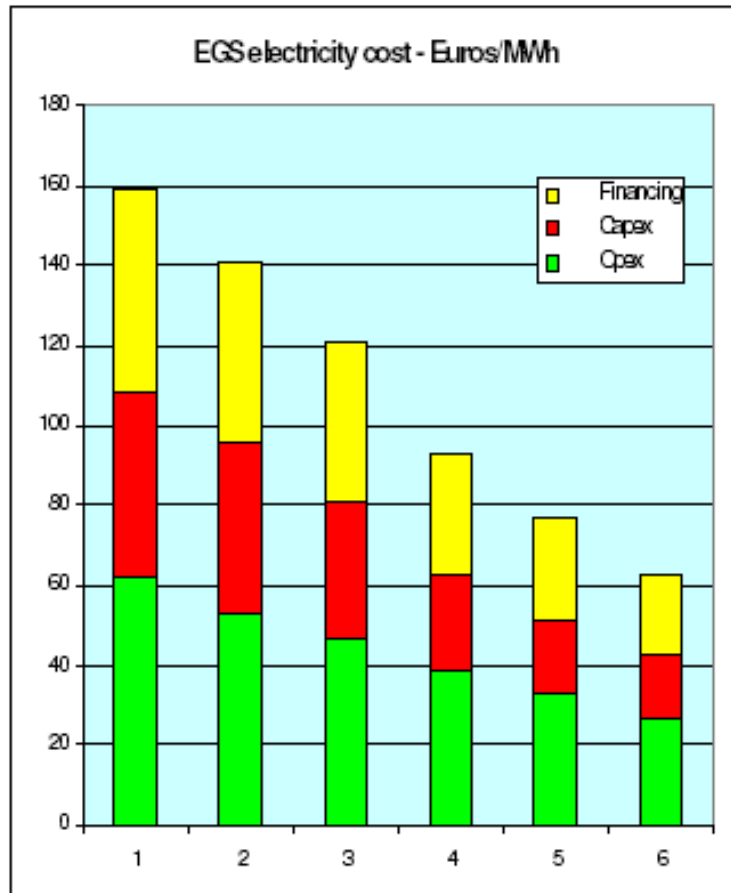
- **Sviluppo nei siti tradizionali idrotermali**
- **Sviluppo impianti binari a bassa temperatura (esiste elettricità sotto 100°C?)**
- **Utilizzazione in cascata**

2020-30 Europa geotermica

2020 → 2030 : Toward a competitive source of energy

➤ EGS:

– Development continues, costs and incentives also

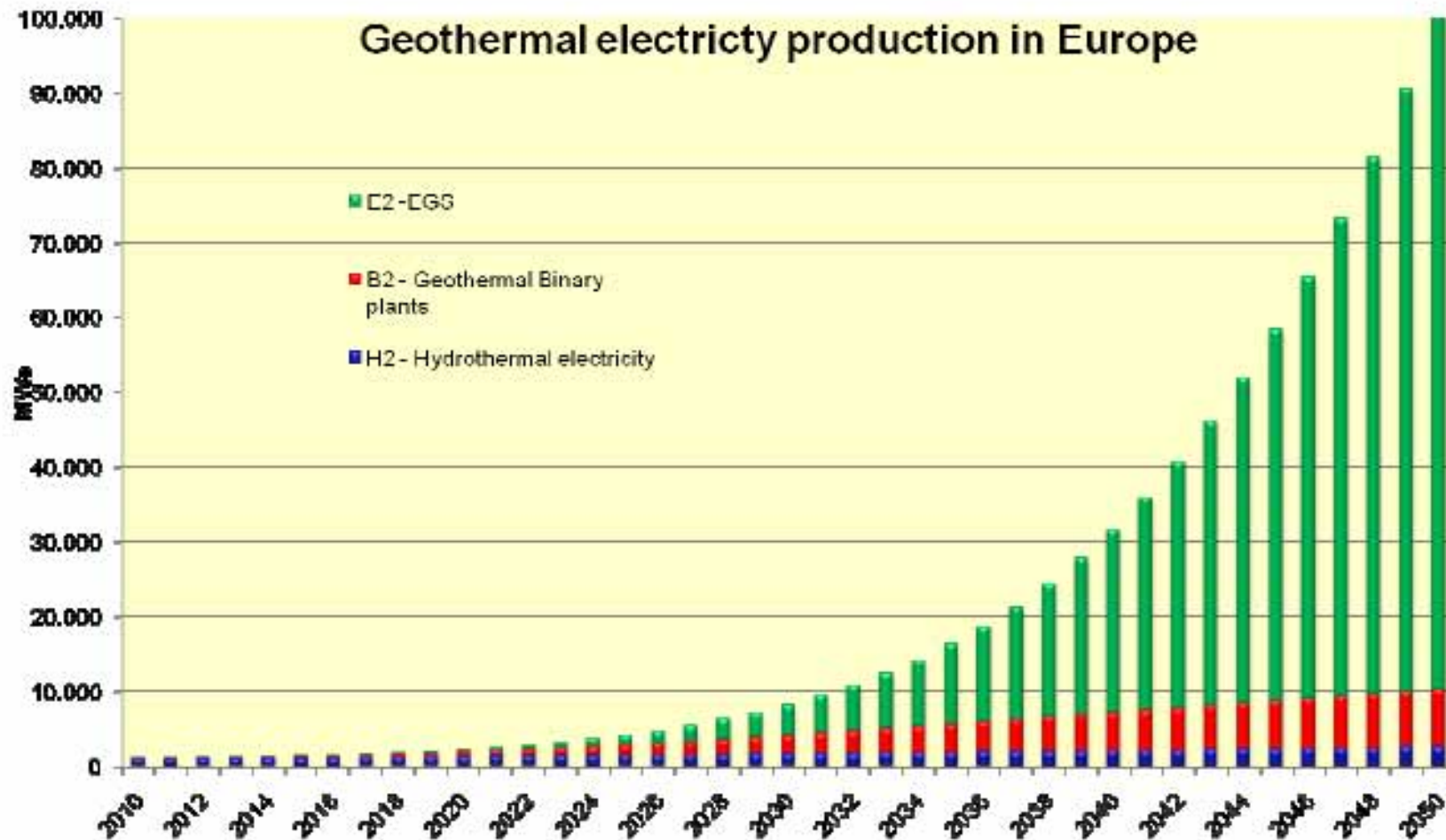


- 1 → 2 Increase flow 80 to 120 L/s/well
- 2 → 3 Increase flow to 160 L/s
- 3 → 4 Increase temperature 150 to 175 °C
- 4 → 5 Increase temperature to 200 °C
- 5 → 6 Increase project size



2030-50 Europa geotermica

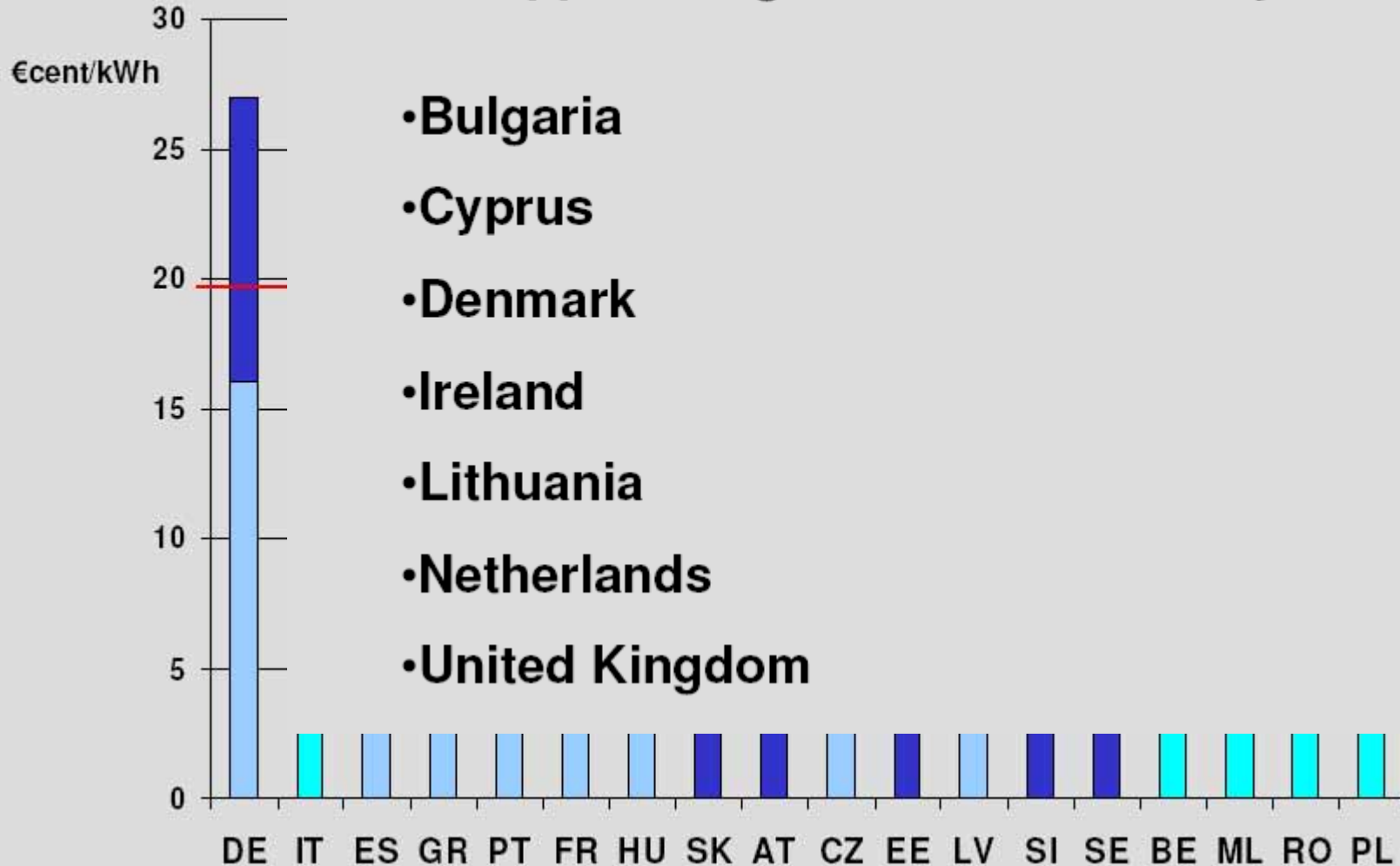
2030 → 2050 : Massive deployment
...to reach 20% of Europe electricity need



2010 Europa geotermica



Geothermal Feed-in tariffs NO support for geothermal electricity in the EU:



- Bulgaria
- Cyprus
- Denmark
- Ireland
- Lithuania
- Netherlands
- United Kingdom



2020 Europa geotermica

EU27 Markets

Potenza(MW)	2009	2015	High / Low
Italy	843	923	High / Low
Portugal	23	60	High
Spain	-	40	Low
Greece	-	30	Low *
France	17	35	High
Germany	7	15	Low
UK	-	-	Low
Austria	1	5	Low
Czech Republic	-	5	Low
Hungary	-	5	Low
Romania	-	5	Low
Slovakia	-	5	Low
Netherland	-	5	Low
Latvia	-	-	Low
Poland	-	1	Low
Total	891	1.134	

Other European Markets

Potenza(MW)	2009	2015	High / Low
Iceland	573	800	High
Turkey	87	206	High / Low
Russia	82	194	High
Total	742	1.200	

**EGP intende sviluppare tutte le tecnologie in Europa,
Ma non entra ancora nel mercato EGS**



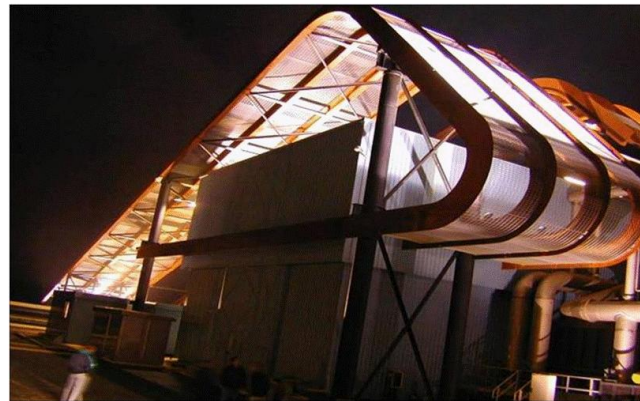
2010-50 Europa geotermica

Barrier	Description	Actions Needed
Resource	<ul style="list-style-type: none"> • Geothermal resource availability • Well productivity & field capacity • Presence of earthquakes-volcanic activity near the resource 	<ul style="list-style-type: none"> • R&D activity: technology improvements to identify the resource and to exploit geothermal resources at different temperatures • Coordination of activities to share exploration results (i.e. public databases providing location of resources)
Environment	<ul style="list-style-type: none"> • Regulation for construction and operations • Air emissions & noise pollution • Visual impact 	<ul style="list-style-type: none"> • Coordination of activities to address permitting issues • Technological solutions (i.e. Enel development of AMIS technology) • Architecture solutions
Project economics	<ul style="list-style-type: none"> • High initial investment costs • High O&M costs • Financial support and incentives 	<ul style="list-style-type: none"> • Coordination at EU, national and regional levels to support and regulate the sector, providing visibility • Support bank financing
Social	<ul style="list-style-type: none"> • Misleading information • Lack of knowledge • Local hostile institutions / environmental associations 	<ul style="list-style-type: none"> • Creation of consensus through information and communication • Improvement of the relationship with communities
Demand	<ul style="list-style-type: none"> • Trend of energy demand • Competition from other renewable sources 	<ul style="list-style-type: none"> • Planning of geothermal projects with grid access • Support to distributed generation/smart grids

Enel Green Power in Italia

Riduzione impatto ambientale

- AMIS
- 30 M€ in ripristino territori
- Soluzioni architettoniche

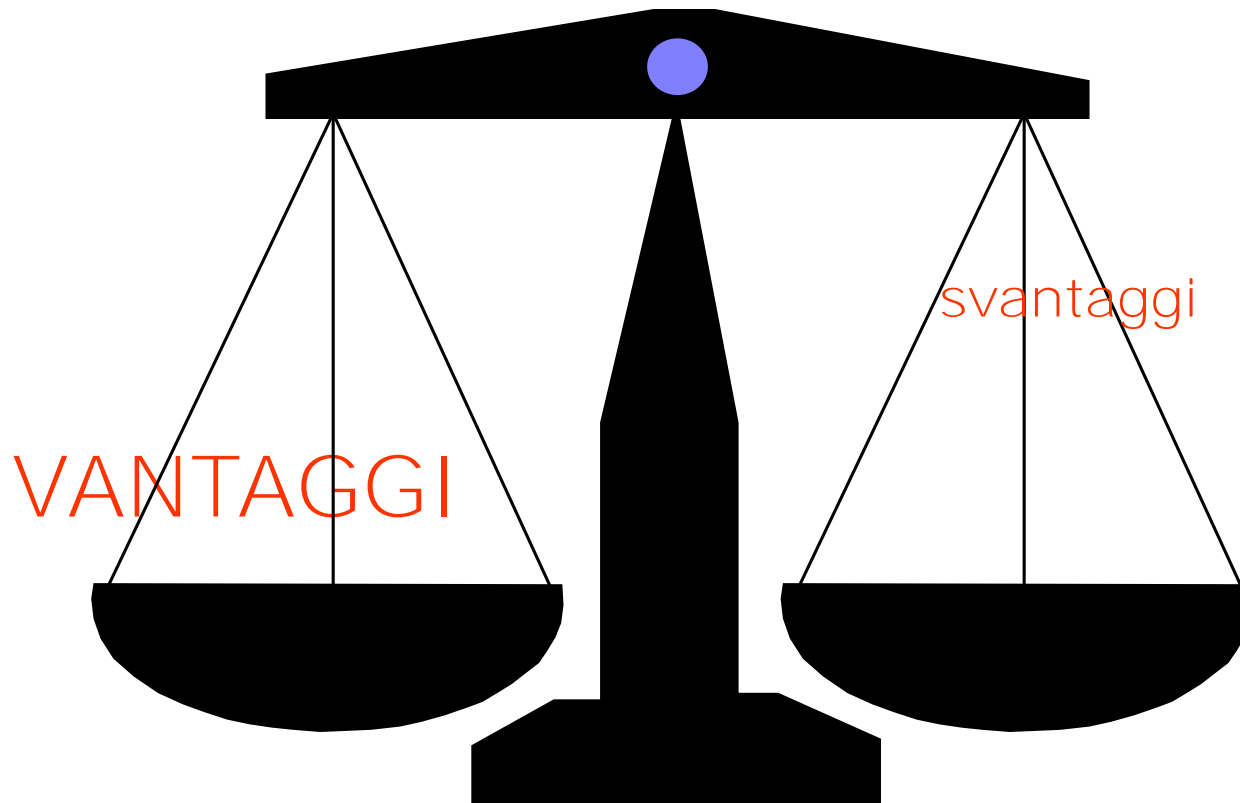


Miglioramento accettabilità

- Comunicazione con realtà locali
- Diffusione di conoscenza (scuole)
- Cooperazione con autorità locali e regionali



2010 Mondo geotermico: Vantaggi/Svantaggi



2010 Mondo geotermico: Vantaggi/Svantaggi

VANTAGGI

Locale e Sostenibile

Basso Impatto Ambientale

Costo Competitivo

Una Risorsa Enorme

Alta Disponibilità, non limitata da fattori esterni

Base-Load per Elettricità

Utilizzazione in Cascata & Uso del Calore



2010 Mondo geotermico: Vantaggi/Svantaggi

VANTAGGI

PULITA

LOCALE

SOSTENIBILE

ECONOMICA

DISPONIBILE



2010 Mondo geotermico: Vantaggi/Svantaggi

SVANTAGGI

Al momento la produzione elettrica e' largamente concentrata in poche aree geografiche

→ impianti binari una possibile soluzione

Grande investimento iniziale,
non accessibile a piccole compagnie

→ accesso a forme di finanziamento/sussidi

Elevato rischio minerario

→ possibilità di forme di assicurazione/migliore ricerca in fase esplorativa/ruolo di agenzie pubbliche



2010 Mondo geotermico: Vantaggi/Svantaggi

Geothermal energy can change
the face of the world



Reykjavik on 1933, when only 3% of the houses used
geothermal energy for heating



Reykjavik today: "Europe's lung" for its low level of air
pollution, now that 99.8% of houses are connected to the
geothermal district heating system

FUOCO
SENZA
FUMO



We have a dream

“Lasciare ai nostri figli una risorsa piu' grande di quella che abbiamo ereditato dai nostri genitori”



1931: Soffionissimo



1999: Montieri 1

GRAZIE PER LA CORTESE ATTENZIONE



Società Geologica Italiana
Fondata nel 1881
Ente Morale R.D. 17 ottobre 1885

CONFERENZA

QUALE FUTURO PER LA GEOTERMIA IN ITALIA?

Venerdì 17 dicembre 2010 - ore 15.00-17.30 aula 11
Dipartimento di Scienze della Terra - Sapienza Università di Roma
Piazzale Aldo Moro, 5 - Roma.

15.10 - **"La geotermia italiana: stato attuale, obiettivi immediati e traguardi futuri"**
Adele Manzella, CNR -Istituto di Geoscienze e Georisorse, Pisa.

16.20 - **"Uno sguardo oltreconfine: Visione Strategica per lo sviluppo geotermico in Europa al 2050"**
Ruggero Bertani, Geothermal Business Development, Enel Green Power S.p.A., Roma.

