



# DEEP GEOTHERMAL OPPORTUNITY

Sustainability and the role of local government

Monday 20<sup>th</sup> June 2011

## ABOUT GT ENERGY

GT Energy is recognised as a leader in the development of deep geothermal energy projects in both Ireland and the UK.

GT Energy brings together leading technology, engineering and construction service providers in the geothermal energy sector



PR MARRIOTT  
DRILLING LTD





# ACHIEVEMENTS TO DATE

- Full planning permission received
- TPA with ESB International
- Drafted geothermal legislation in Ireland

## Milestones

2007	2008	2009	2010	2011
<ul style="list-style-type: none"> <li>• GT Energy was established to investigate and develop deep geothermal energy projects</li> </ul>	<ul style="list-style-type: none"> <li>• €1.5m programme to prove the existence of a geothermal resource in Dublin commenced</li> </ul>	<ul style="list-style-type: none"> <li>• Two 1.4km boreholes confirming a temperature of 46.20C indicating a temperature gradient of 32.4oC per km</li> <li>• Strategic Alliance signed with Ballymena Borough Council</li> </ul>	<ul style="list-style-type: none"> <li>• Signed Technology Partnership Agreement with ESBI to feasibly study geothermal power generation at Newcastle site</li> <li>• Seismic Acquisition survey undertaken proving basin depth of 4km, est basin temp. 131 C</li> <li>• Pipeline of projects to include GeoHeat supply in the UK</li> <li>• Collaboration Agreement signed with Manchester City Council</li> </ul>	<ul style="list-style-type: none"> <li>• Business model expanded to include Biomass Combined Heat and Power supply to district heating schemes</li> <li>• UK pipeline progression awaiting policy implementation by UK government</li> </ul>

### IRISHTIMES.com

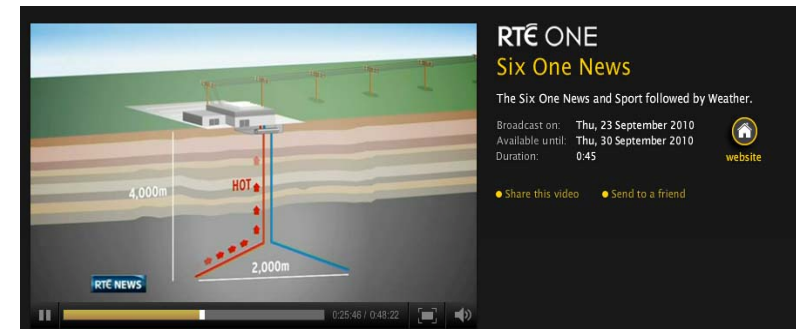
The Irish Times - Monday, May 31, 2010

#### Irish companies join forces to tap geothermal energy

BARRY O'HALLORAN

ESB INTERNATIONAL (ESBI) plans to join with GT Energy to develop systems for generating electricity from geothermal energy – heat generated under the ground.

Under the deal's terms, GT will generate up to 50 megawatts (MW) of electricity – enough to power about 50,000 homes – at Irish sites it has identified.



# OVERVIEW

The EU has committed itself to the target of increasing the share of renewables in energy use to 20% by 2020

There is a **30** times increase required to meet current UK RES-H target of 12% by 2020

**47%** of all Final Energy Consumption in the UK is for Heating



## **Supported by Renewable Energy Incentives**

Significant increase in support for clean energy generation



## **Energy Security**

Desire to reduce dependence on fossil fuel from unstable parts of the world.



## **Scalability**

Technology and resource easily scalable as evidenced in Germany



## **Climate Change**

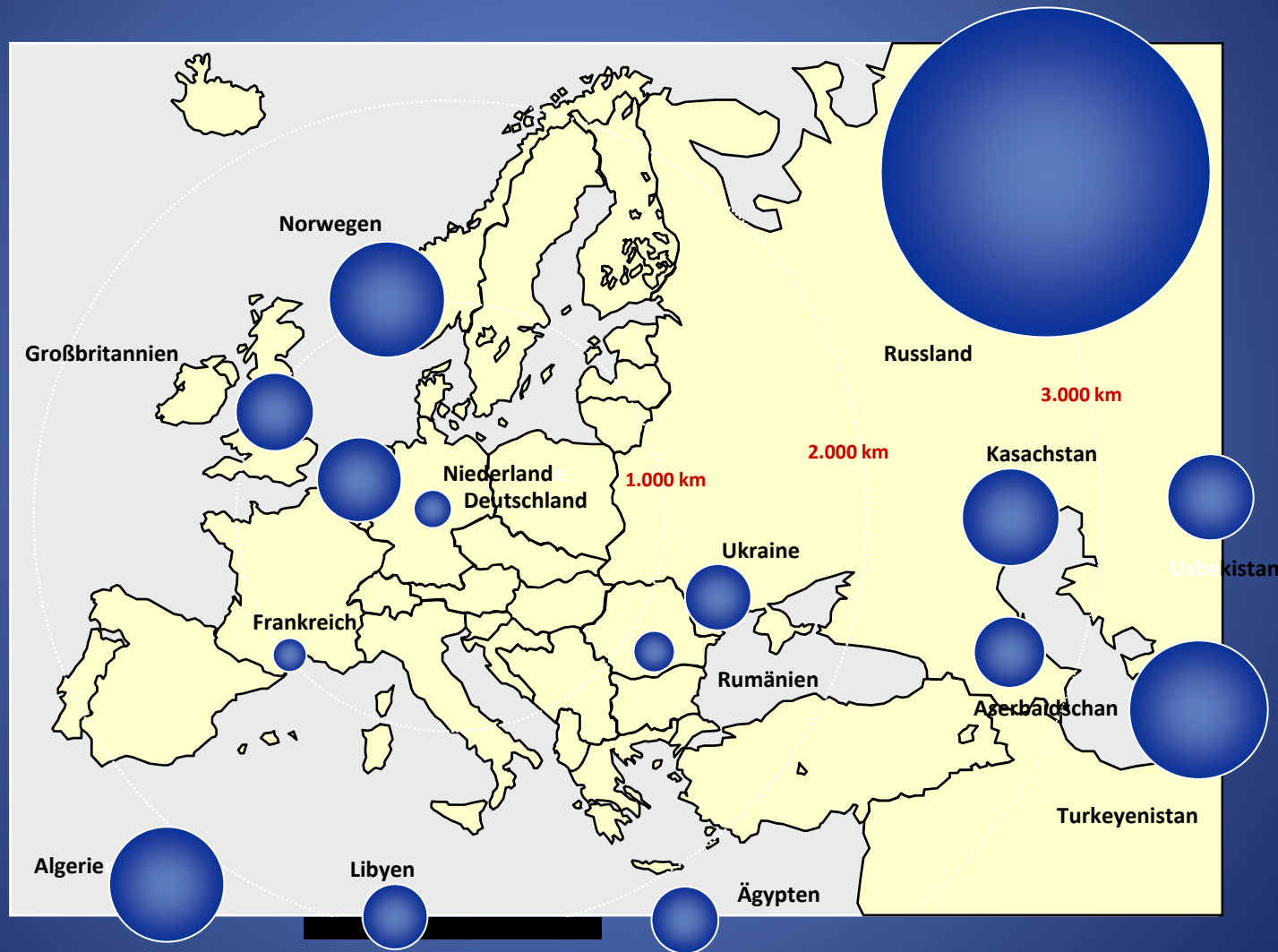
Increasing awareness of need to reduce CO2 emissions from burning fossil fuels.



## **Visual impact**

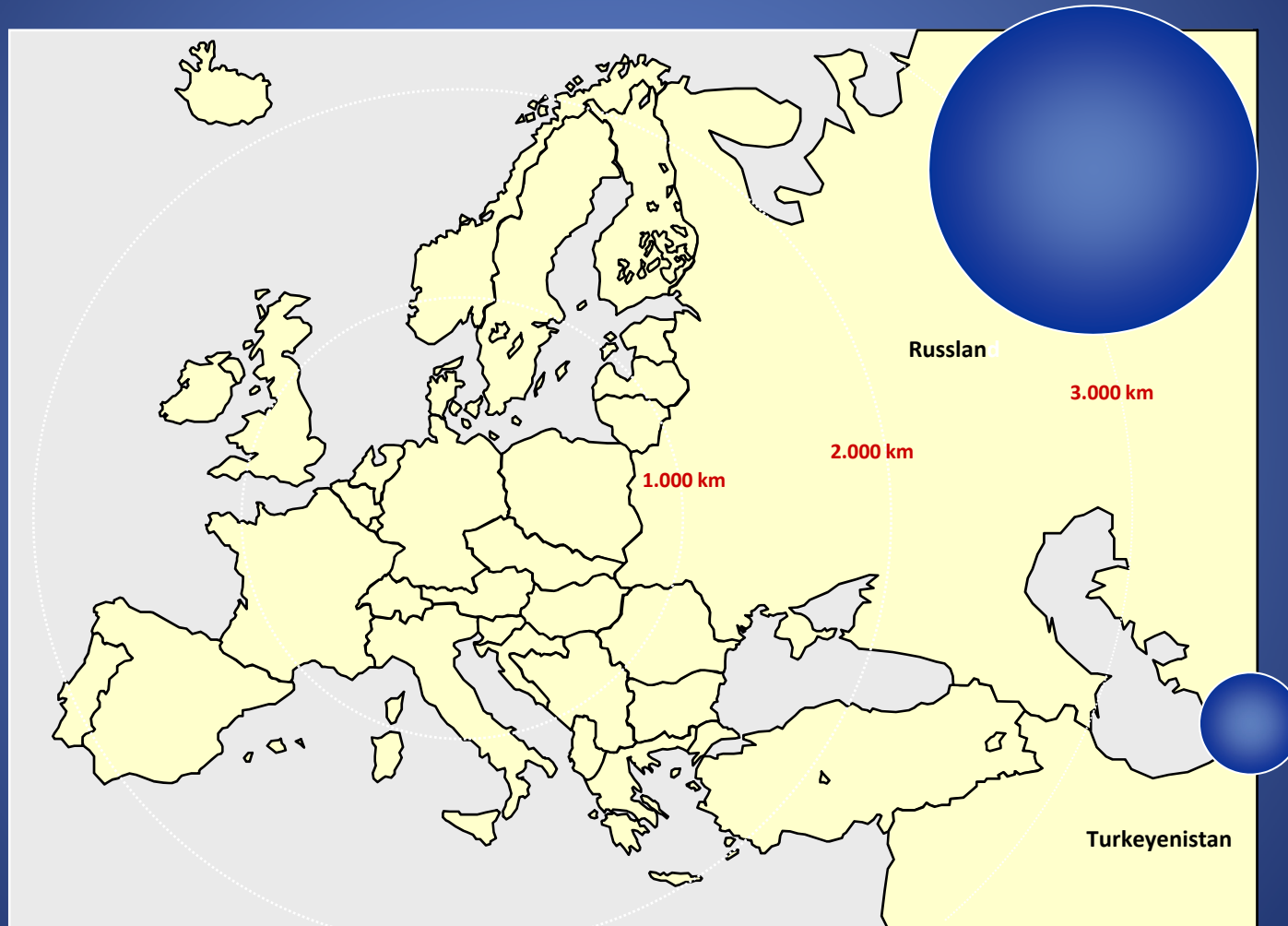
Low visual impact ideally suited for renewable energy delivery in urban locations

# Why use renewable sources?



Sources of Natural Gas: 1999

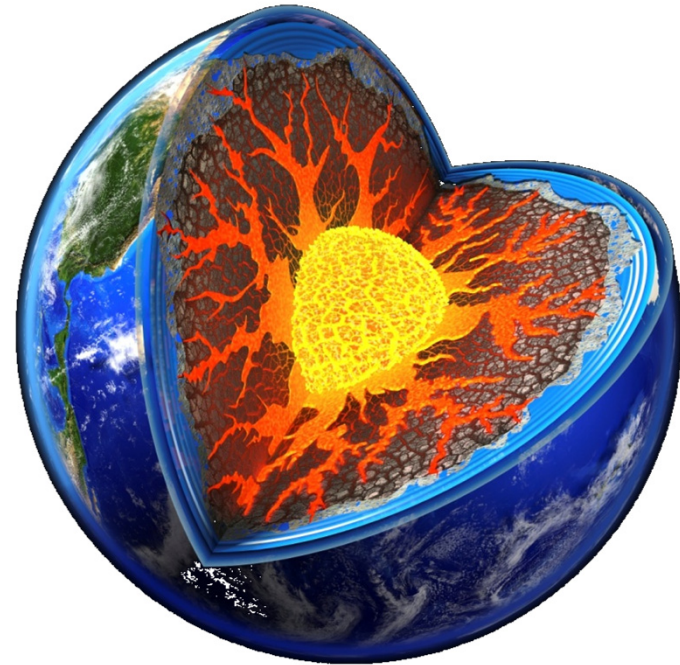
# Why use renewable sources?



Sources of Natural Gas: 2025

# WHAT IS GEOTHERMAL ENERGY?

- Is a natural form of renewable energy
- Is energy generated from the decay of natural materials at the earth's core
- Estimated temperature of the earth's core is 6,000 C
- Harnessed for centuries throughout the world
- Remains largely untapped



**4,000**

times the earth's energy needs could be met by  
geothermal energy



# HOW IS GEOTHERMAL ENERGY HARNESSSED?

## 1. Drilling

- A geothermal well doublet system drilled to a depths of up to 5,000 metres

## 2. Extraction

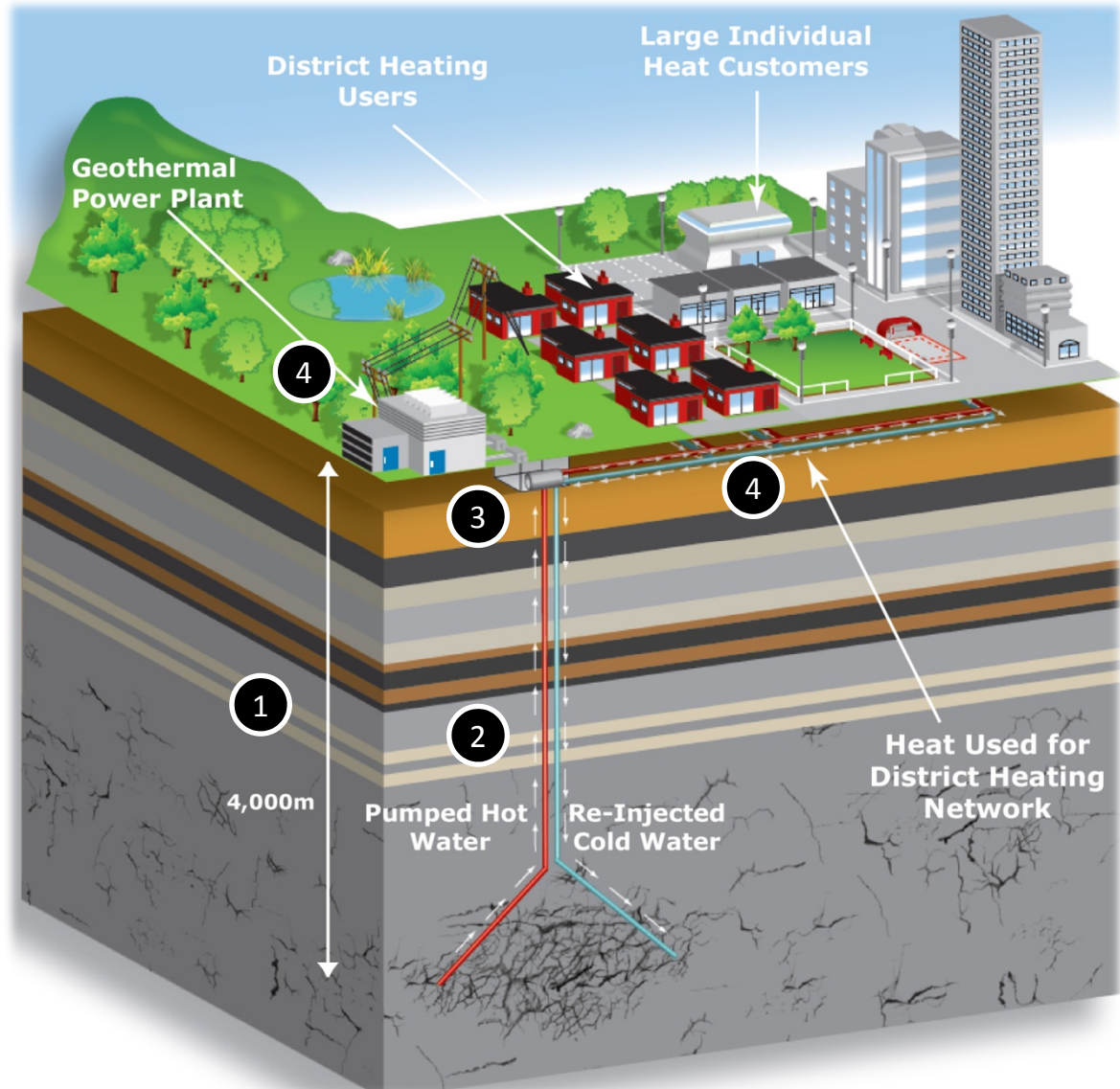
- Hot geothermal fluids are pumped to the surface through a production well;

## 3. Heat Exchange

- The heat is extracted through a heat exchanger and transferred to a working fluid
- The cooled geothermal fluid from the heat exchanger is returned to the geothermal reservoir through a re-injection well

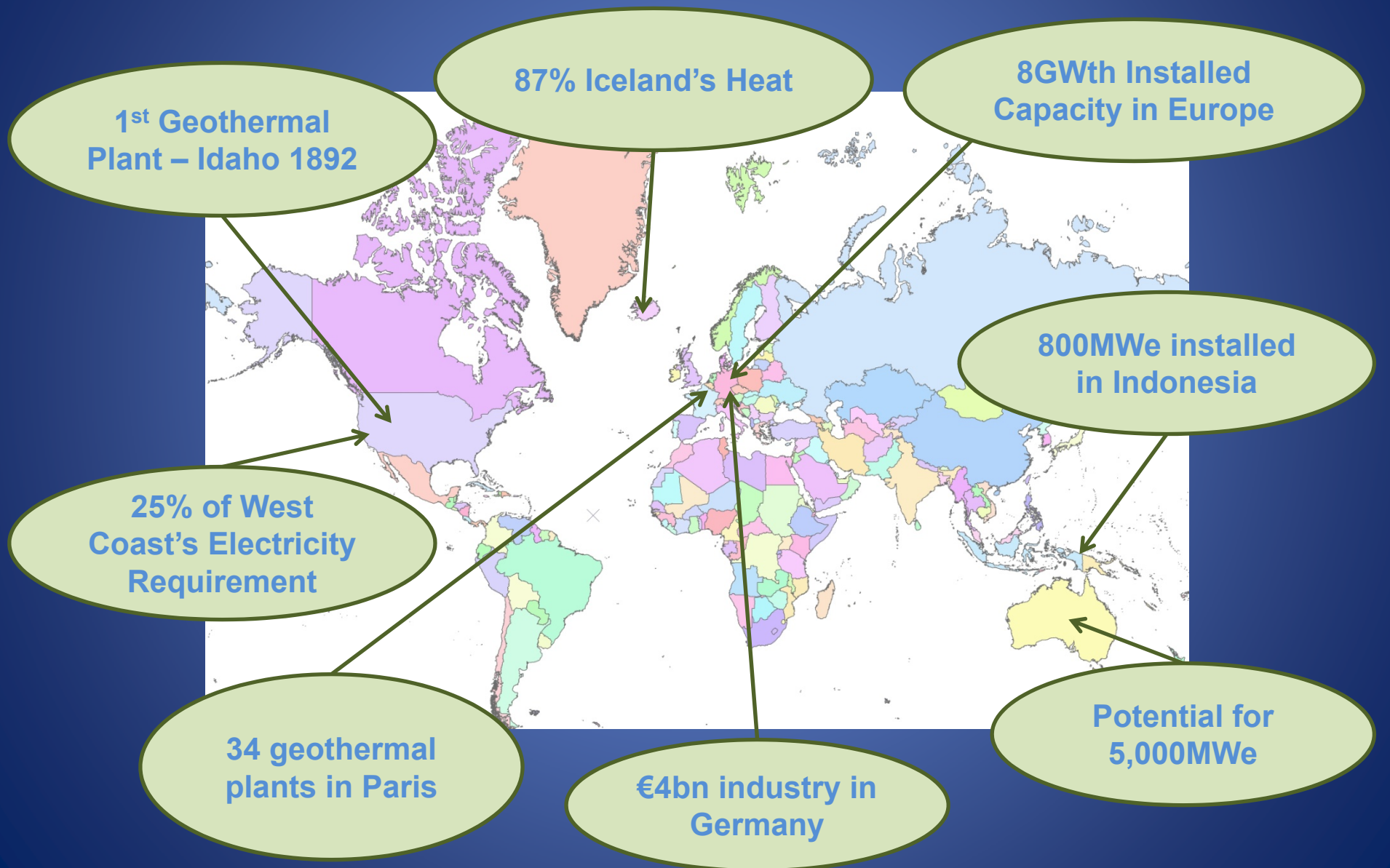
## 4. Distribution

- Electricity, to a grid
- Heat



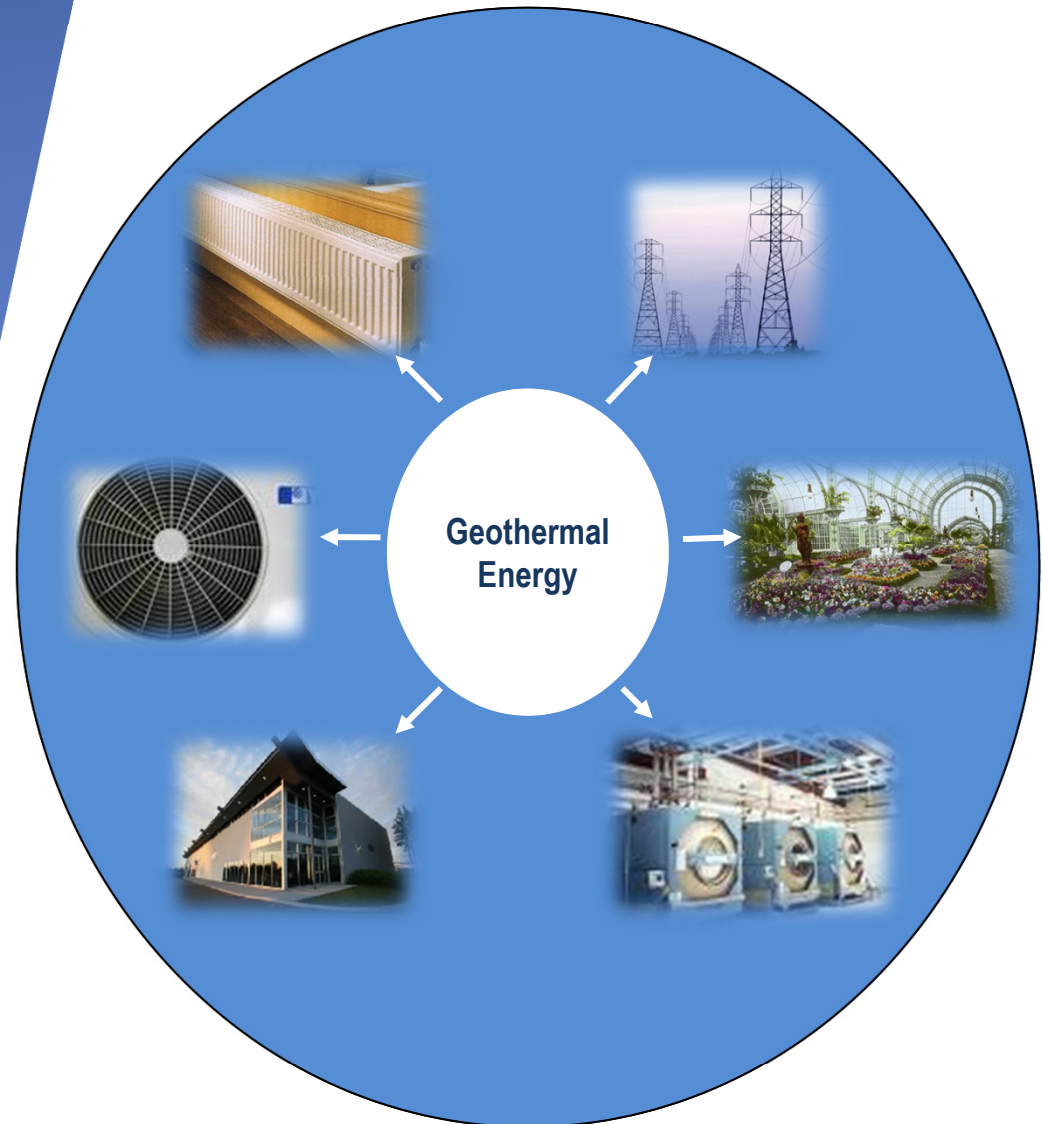


# Geothermal development around the world



## WHAT CAN IT BE USED FOR?

- Provision of heat to district heating schemes
- Generation of electricity
- Heat supply to large horticulture growers
- Heat supply to large Universities, Hospitals Prisons
- District cooling
- Cooling for large data centres



# WHY GEOTHERMAL ?



Geothermal

Huge scalability

Low visual impact

Base load supply

No fuel stock  
reliance

Urban deployment



Low visual  
impact  
Ideal for  
urban  
locations



  
**GT Energy**  
Energy for the future



# Underground Geothermal Heat Plant



Unit 11  
Greenage Business Park  
Rathfriland, Co. Dublin  
Tel: 011 407026  
Fax: 011 407199

**GT Energy**  
Energy for the future

Job No	Client	Scale
GEOTHERMAL_ENERGY_CENTRE	GT Energy	1:100
Project No	GEOTHERMAL_ENERGY_CENTRE	Sheet
Project Name	GEOTHERMAL_ENERGY_CENTRE	Scale
Project No	GEOTHERMAL_ENERGY_CENTRE	Scale
Project Name	GEOTHERMAL_ENERGY_CENTRE	Scale
Project No	GEOTHERMAL_ENERGY_CENTRE	Scale
Project Name	GEOTHERMAL_ENERGY_CENTRE	Scale







# Pullach im Isartal

- 12 kilometres South West of Munich City with a population of circa 9,000 inhabitants;
- The project commenced in 2004 as part of Local Agenda 21 initiative. with the drilling of two boreholes to depths in excess of 3,500m and geothermal water with temperatures in excess of 100°C achieved;
- The rollout of the district heating network commenced targeting municipality buildings including social housing in the first instance and has extended to connect residential and commercial customers in the town;
- Currently 30km of network have been rolled out through the town with in excess of 1,800 customers currently connected.



# Pullach im Isartal

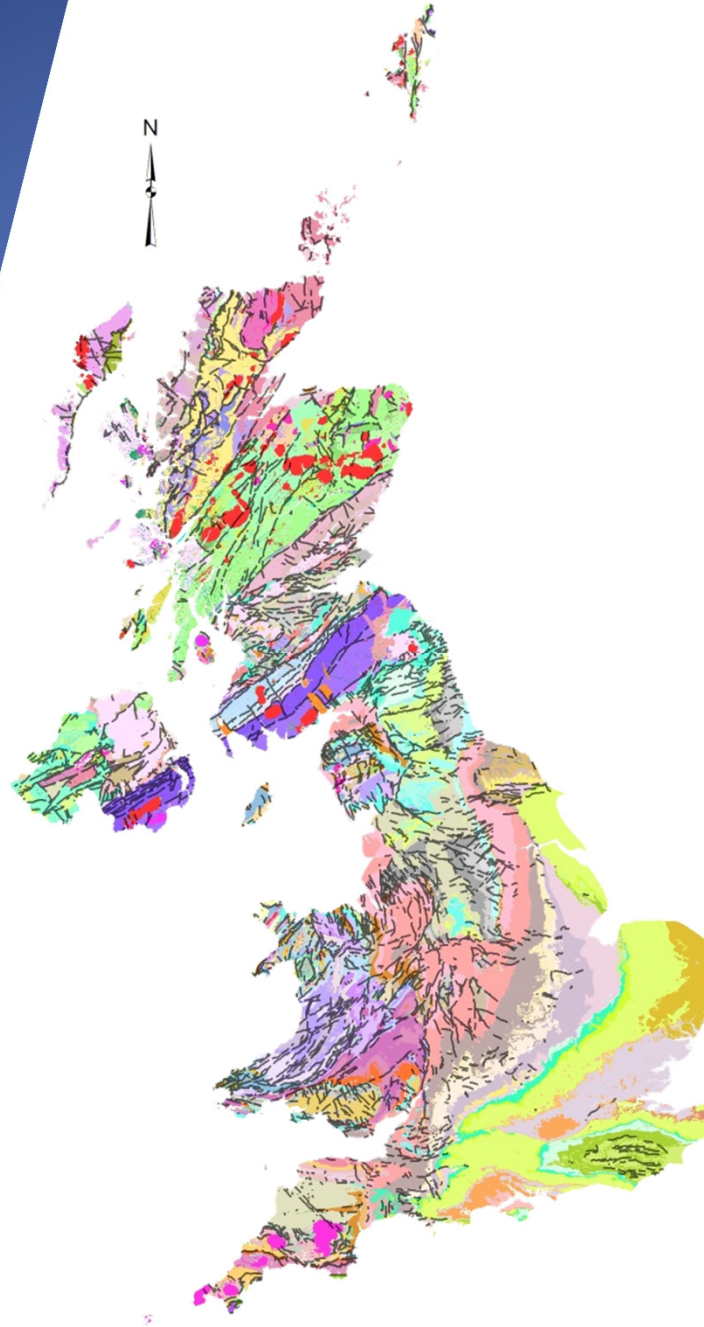
- Total network is expected to grow to 40 kilometres;
- Current take-up rate is 80-100% per street compared to the 40% originally calculated;
- Municipality have drilled a third well in order to provide additional heat energy to the town to meet future energy demand;
- Won the Federal German Excellency Award for Climate Change in 2009.





## UK Potential

A significant number of cities and towns across the UK have been identified as suitable for geothermal energy development

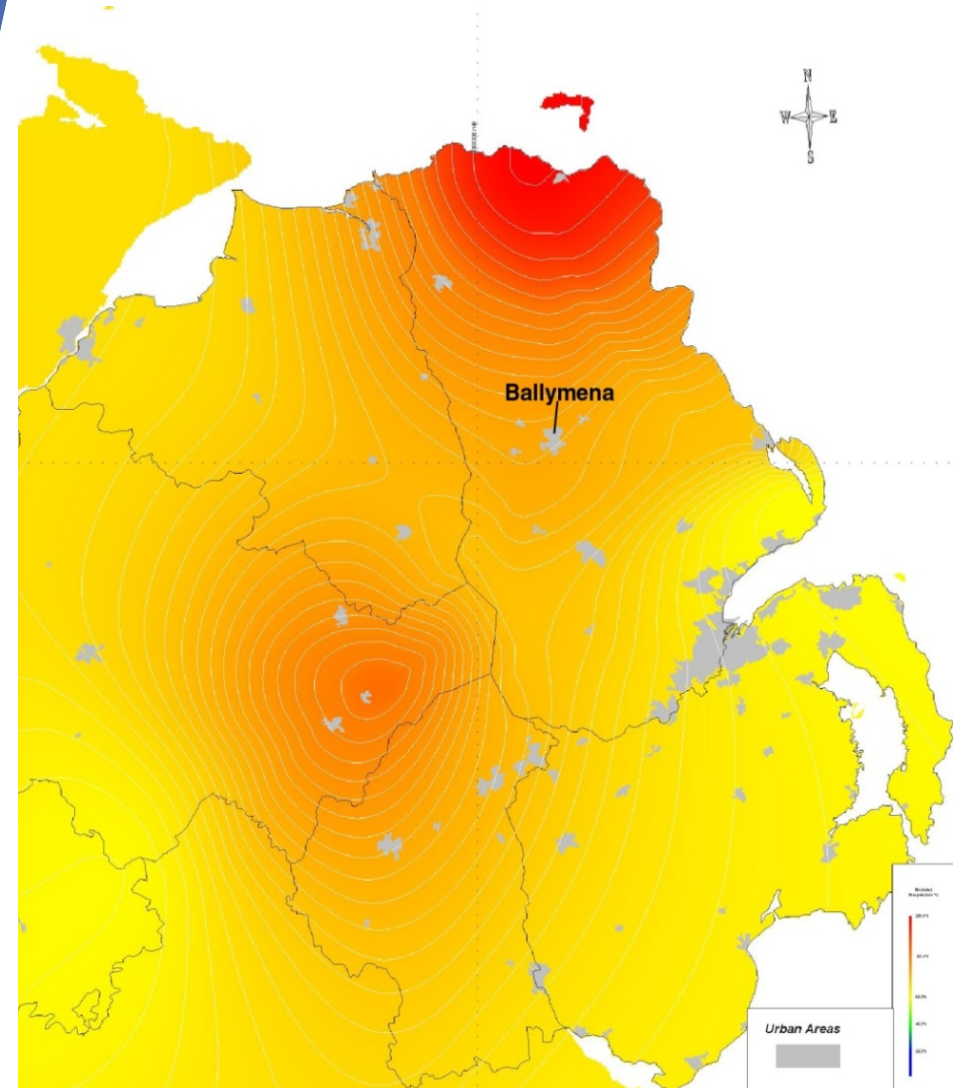


- Ballymena
- Antrim
- Larne
- Cornwall
- Stoke on Trent
- Chester
- Liverpool
- Warrington
- Crewe
- Wrexham
- Southport
- Southampton
- Portsmouth
- Poole
- Isle of Wight
- Manchester
- Newcastle
- Sunderland
- Hull
- Grimsby
- Middlesborough

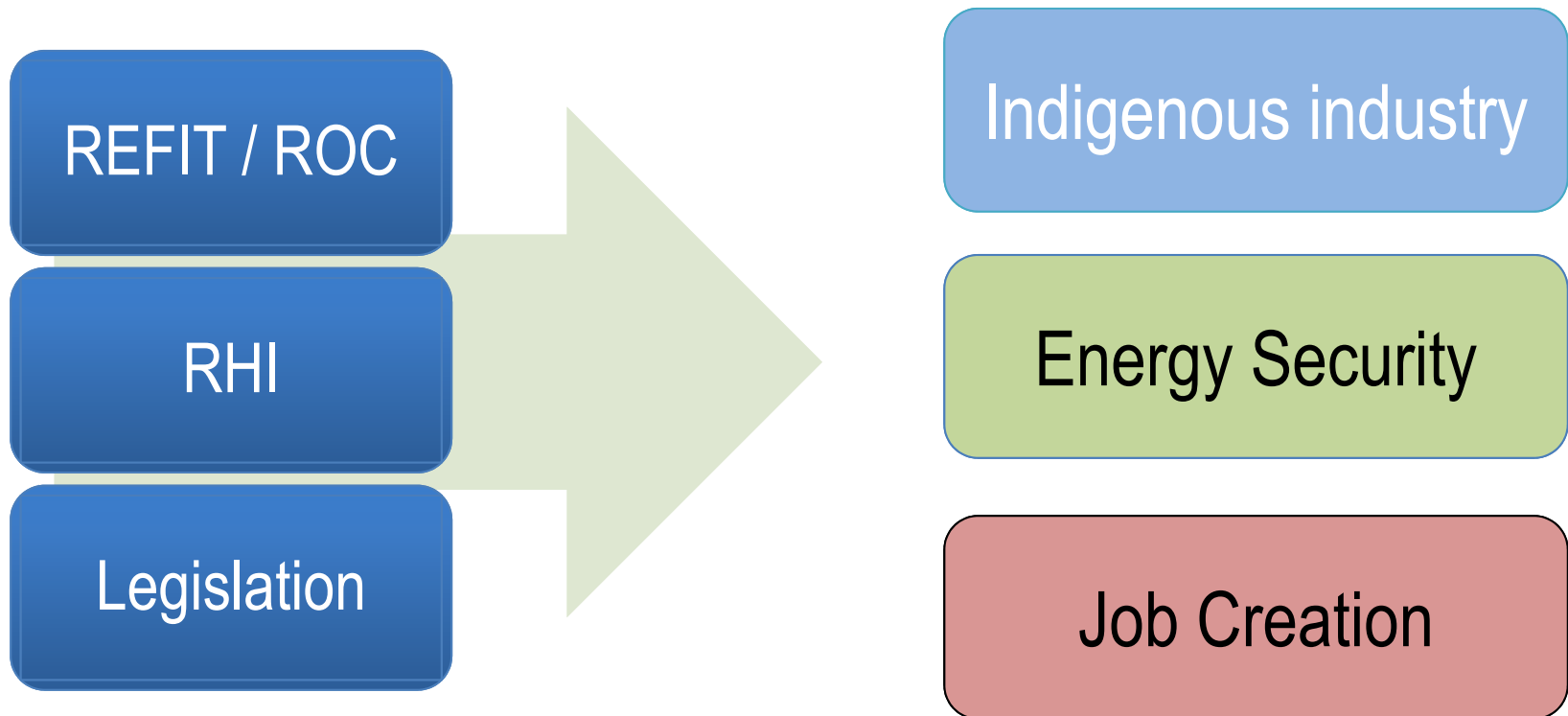


# Northern Ireland Potential

- A study of Northern Ireland completed in 2008 by Action Renewables identified the potential for geothermal energy development;
- Areas of significant potential were identified based on existing deep oil and gas borehole information and acquired TELLUS survey data;
- Ballymena amongst other areas in Northern Ireland was highlighted as an area of high geothermal potential based on existing information;

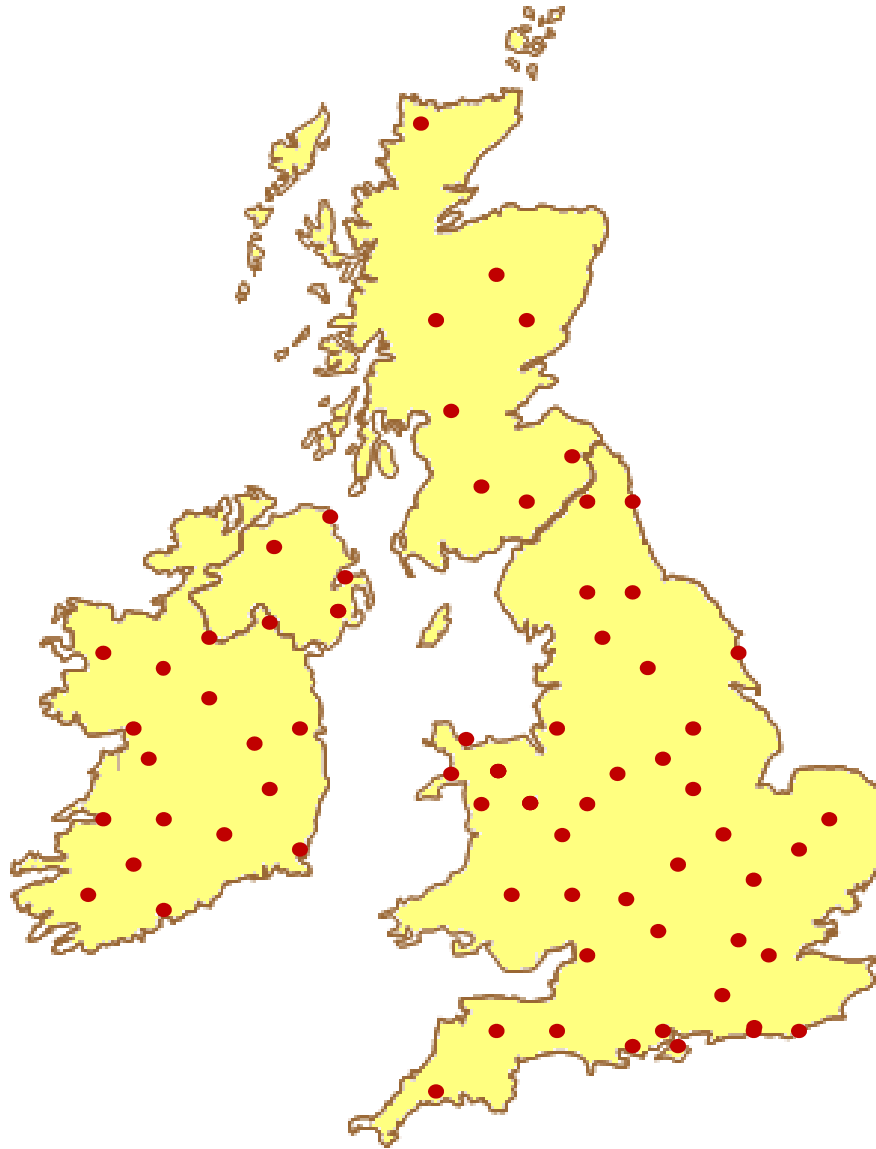


## WHAT IS REQUIRED



# THE FUTURE

Geothermal Plants in  
every town in  
Ireland and  
the UK.





# CONTACT DETAILS

GT Energy  
Unit H, Grants Road  
Greenogue Business Park  
Rathcoole, Co. Dublin

Company Registration No. 441667

Tel: +353 (0)1 401 1020  
Fax: +353 (0)1 401 1760  
Email: [info@gtenergy.net](mailto:info@gtenergy.net)  
Website: [www.gtenergy.net](http://www.gtenergy.net)

