



# The Strategic Role of Geothermal in the NI's Energy Transition

Dr Simon Todd NI Assembly APG on Climate Action | April 2026



## NI's 2030 Reality Check: We Are Not on Track

⚠️ **NI is off-track on its 25% energy savings target:**

- Only ~5% achieved by the midpoint
- Largely because efforts have focused on electricity (e.g. LEDs)
- Much bigger prize — **heating and cooling.**

🔥 **Geothermal heat pumps are the step-change opportunity:**

- Far more efficient than boilers or air-based systems ( >400% vs ~85%–250%)
- Enabling **80%+ reductions in building energy use** (e.g. 1 GWh → ~200 MWh in a municipal case study).

**But we can still deliver with a concerted effort**



# Northern Ireland is a Geothermal “Goldilocks Zone”

Scale Potential



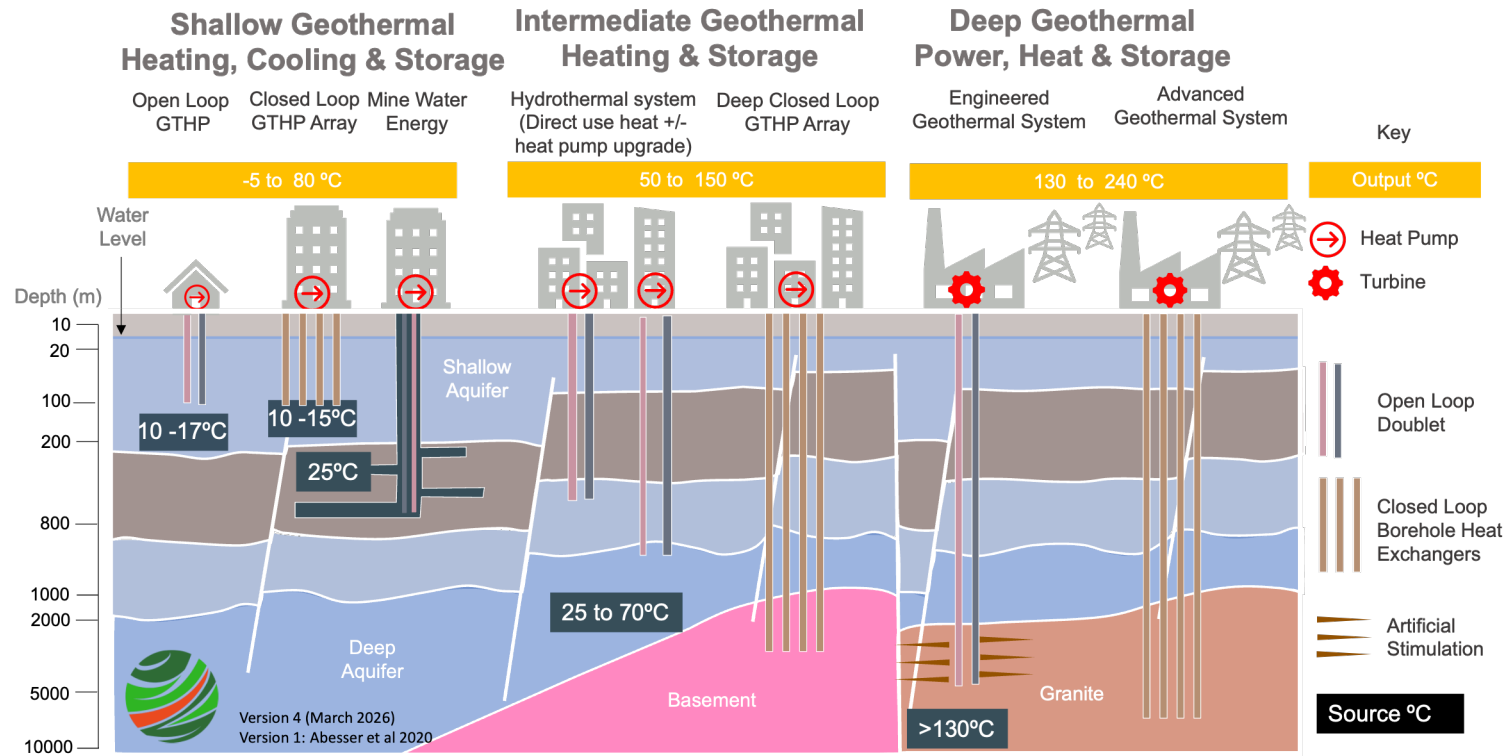
- Proven, scalable
- Low subsurface risk



- Geology-dependent
- Bankable with data



- Exploration risk
- Not yet investable at scale



From Todd et al. 2026 in final review for GeoEnergy



# Geothermal's Role in NI's Energy System

## Decarbonises Heat (Core Role)

- Direct cost-competitive replacement of gas & oil
- Works across: Buildings, Heat Networks, Others

*"Always available (no intermittency)"*

## Enables Electrification (Hidden Role)

- Improves heat pump efficiency (higher COP)
- Reduces winter peak demand
- Lowers electricity system stress

*"Makes electrification work at scale"*

## Provides Thermal Storage (System Role)

- Shallow Geothermal as thermal battery – store summer heat for winter
- Helps Demand Side Management of Power
- ATEs – all of Greater Belfast Area is underlain by the right resource

*"Enables heat networks"*

Geothermal is not just a heat source — it is energy infrastructure.



## Status → Barriers → Solutions

### Status

- A few commercial scale GSHPs
- DfE's Strategy and GeoEnergy NI
- Growing interest in “proper” feasibility assessments
- Potential pathfinder projects, e.g. Causeway Hospital, Coleraine

### Barriers

- ~~Levelised Cost~~
- Geothermal dismissed early – limited capability/awareness
- ↔ Vicious cycle – capability doesn't grow
- Upfront capital costs & limited budgets
- Risks & uncertainties – real... and perceived

### Solutions

- Requirement for public sector to conduct expert feasibility studies
- Shift public sector procurement from capital projects to procuring “heat as a service”
- Underwrite private portfolio fund to support risk management

Geothermal can be scaled rapidly – without new primary legislation



**CEO Dr Patrick Keatley**

**Briefing to APG on Climate Action**

**24/04/2026**

# Context

## Wasted wind energy in NI in 2025 - 662 GWh

- Enough electricity for more than 25% of NI homes

## Fuel poverty in NI

- 39% (NEA), 34% (CCNI), 27% (BRE)
- 300 excess deaths due to cold homes (NEA)

# PURPOSE

**EnergyCloud is a non-competitive, non-profit organisation that uses surplus renewable energy — energy that would otherwise be wasted — to support households at risk of fuel poverty, without distorting markets or exposing residents to risk.**



# Background and development

- **Launched in UU 2020 – inspired by Food Cloud**
- **Now operating in Ireland, Scotland, England, Germany**
- **Charitable companies – not for profit**
- **Communications layer between SOs and households**
- **100 homes in NI, 1,000 homes in RoI**

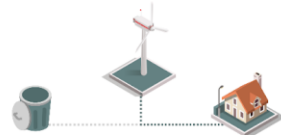


# Ping and boost

**1** High Wind Forecast, Get ready for free hot water!



**2** Surplus energy diverted to resident's home.



**3** EnergyCloud technology starts heating their hot tank.



**4** Resident wakes up to a free tank of hot water.



What resident gets?



What resident has to do?



What resident pays?



# Ping and boost



**EnergyCloud: Surplus wind energy is available now**

EnergyCloud: Surplus wind energy is available now (7:00pm–9:00pm). If it suits, switch on your electrical appliances or use timers. Your smart meter will record usage and you will receive a credit from E.ON.

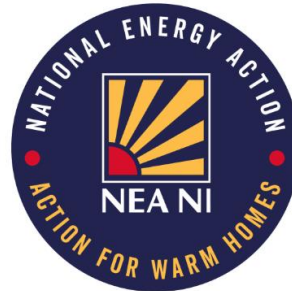
10:48

**EnergyCloud: Something rare is happening tonight**

Between 7:00pm–9:00pm surplus wind energy is expected that would otherwise go to waste. If it suits, set timers or use your electrical appliances during this period. Your smart meter will record your energy usage and you will receive a credit from E.ON on your next bill.

10:47





# Vision

- **Connect all 140,000 NI social homes**
- **Provide 50% free electricity per year**
- **Saving ~ £380 per home**
- **Injecting ~ £67m into the NI economy**
- **Reducing CO<sub>2</sub> ~ 52k tonnes**



# Barriers and solutions

- **Trials at scale with SONI/NIE (smart meters?)**
- **UKRI – consumer led flexibility**
- **Total social value**
- **Policy and regulatory backing**