



Gateway to the Rockies
HINTON

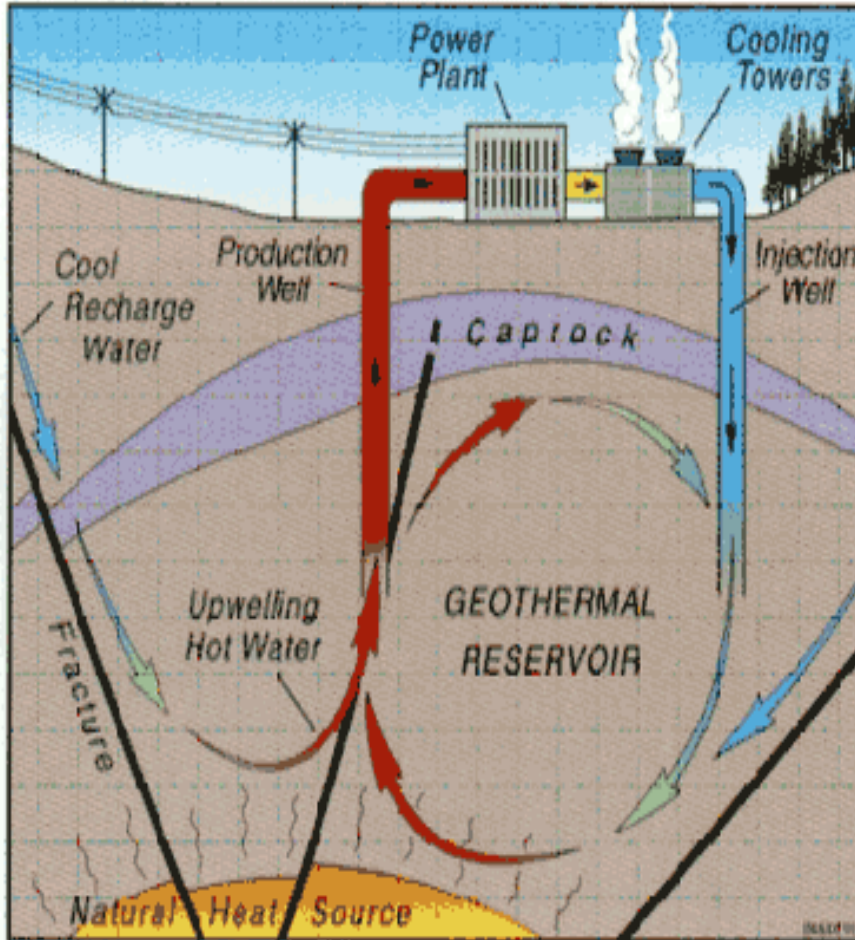
Hinton Geothermal

Northern Alberta Development Council - ENERGIZING THE NORTH

March 30th, 2017



How is Geothermal Energy Produced?



- Geothermal fluid is circulated through a network of production and injection wells
- Thermal energy is extracted and used as heat or converted to electricity

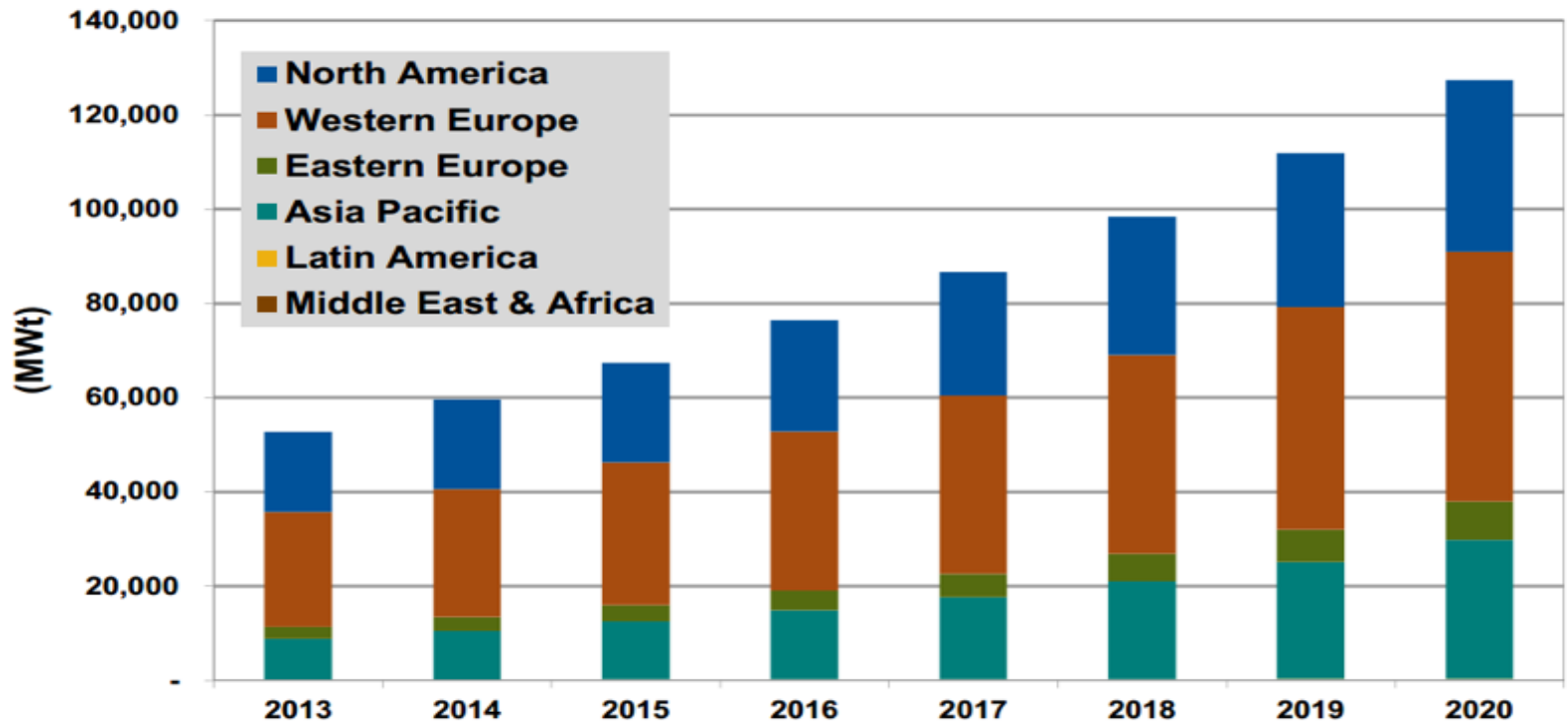


Geothermal District Heating

Is this just a bunch of hot water?



Chart 1.1 GHP Installed Capacity by Region, World Markets: 2013-2020

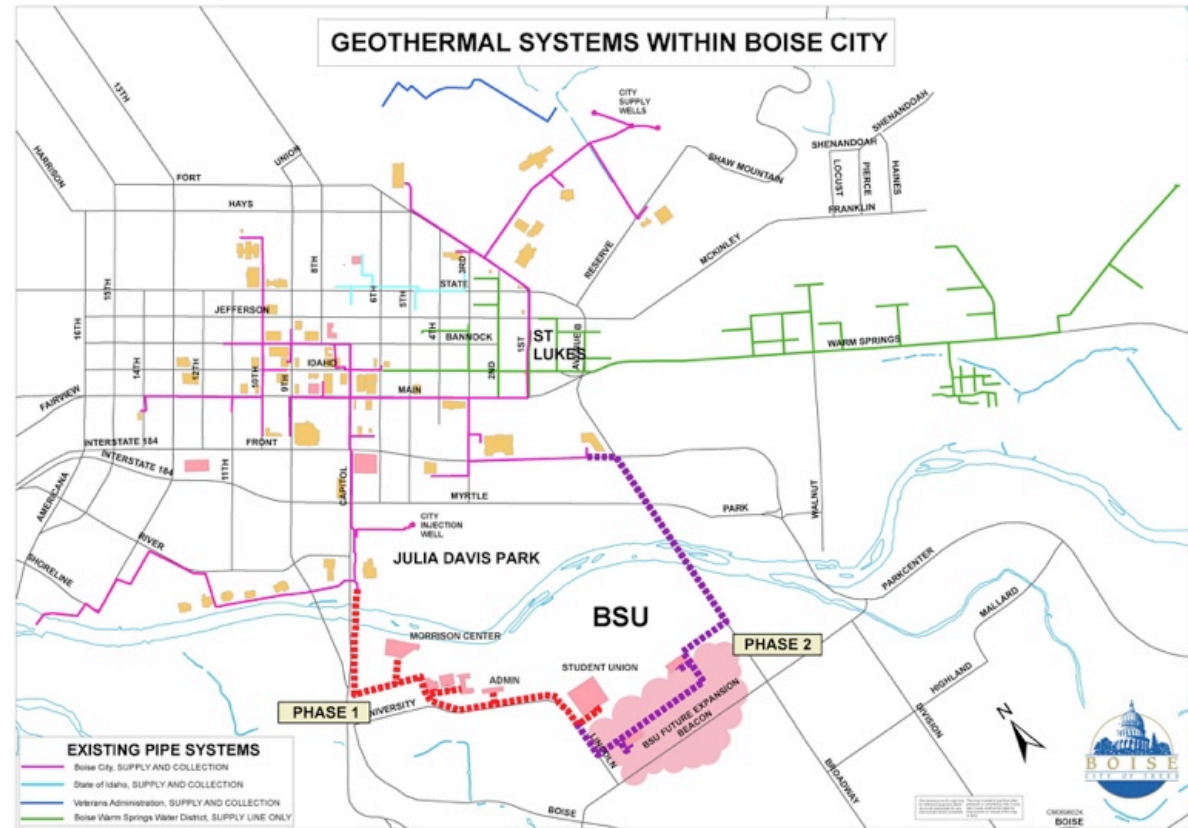


(Source: Navigant Research)

- 19 US operating GDH systems, 59-103C, from .2 to 30 MWth
- 240 operating European GDH systems, from 0.5 to 50 MWth

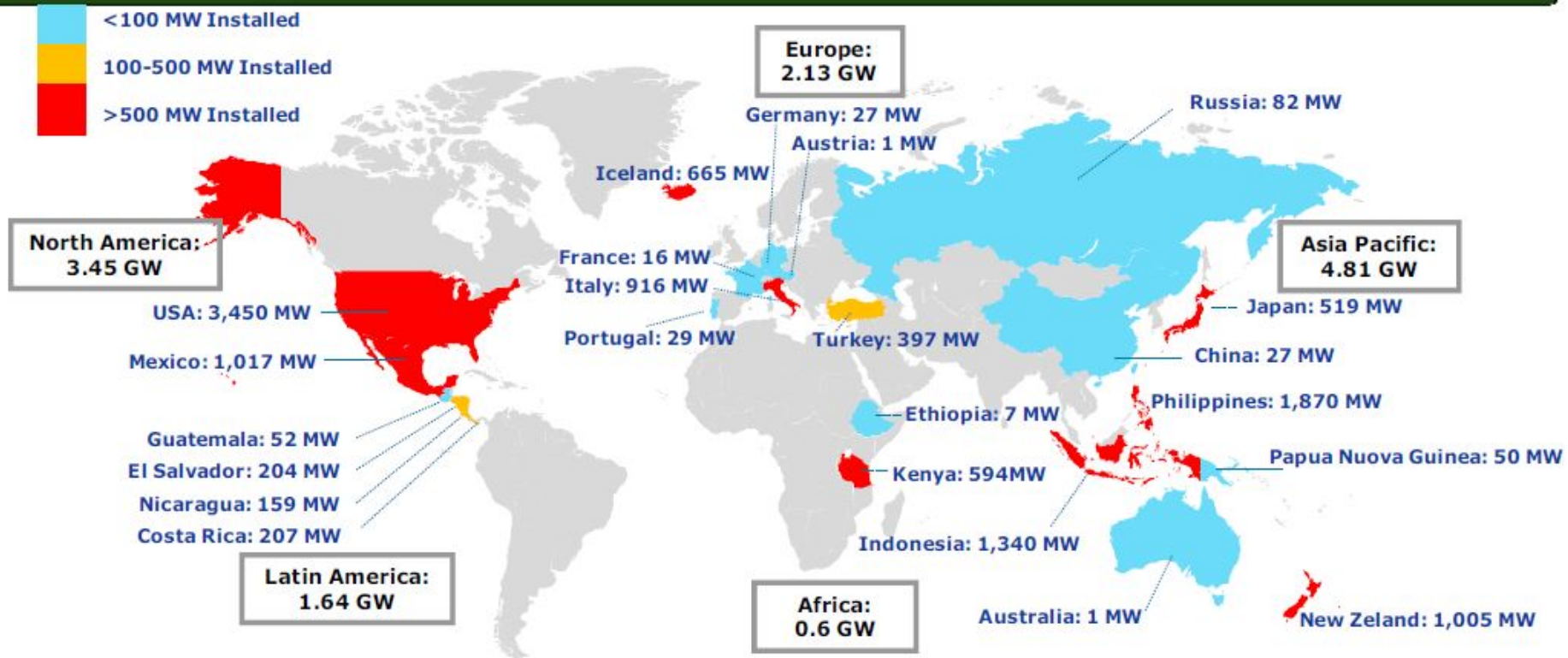
Boise, Idaho

- Geothermal District Heating installed and operating since 1892
- 4 systems draw heat 250+ homes & 85 government buildings & businesses including State Capital and BSU
- Over 4million square feet
- Nearly 21km of pipe



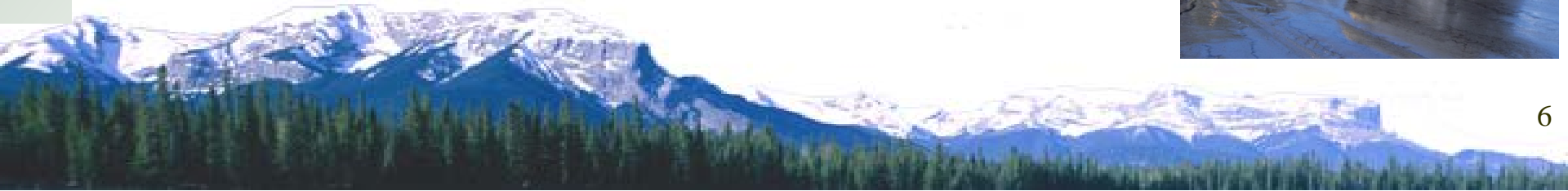
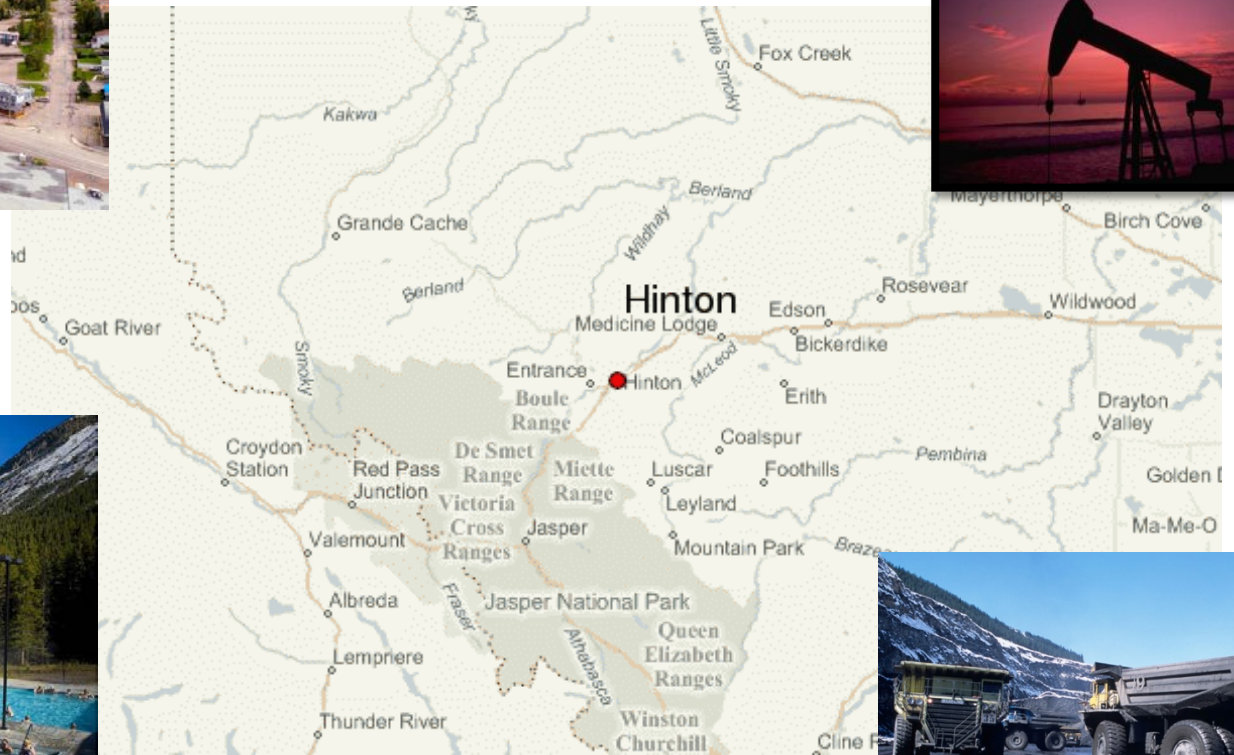
What about power?

2015 Geothermal Installed Capacity (MW)

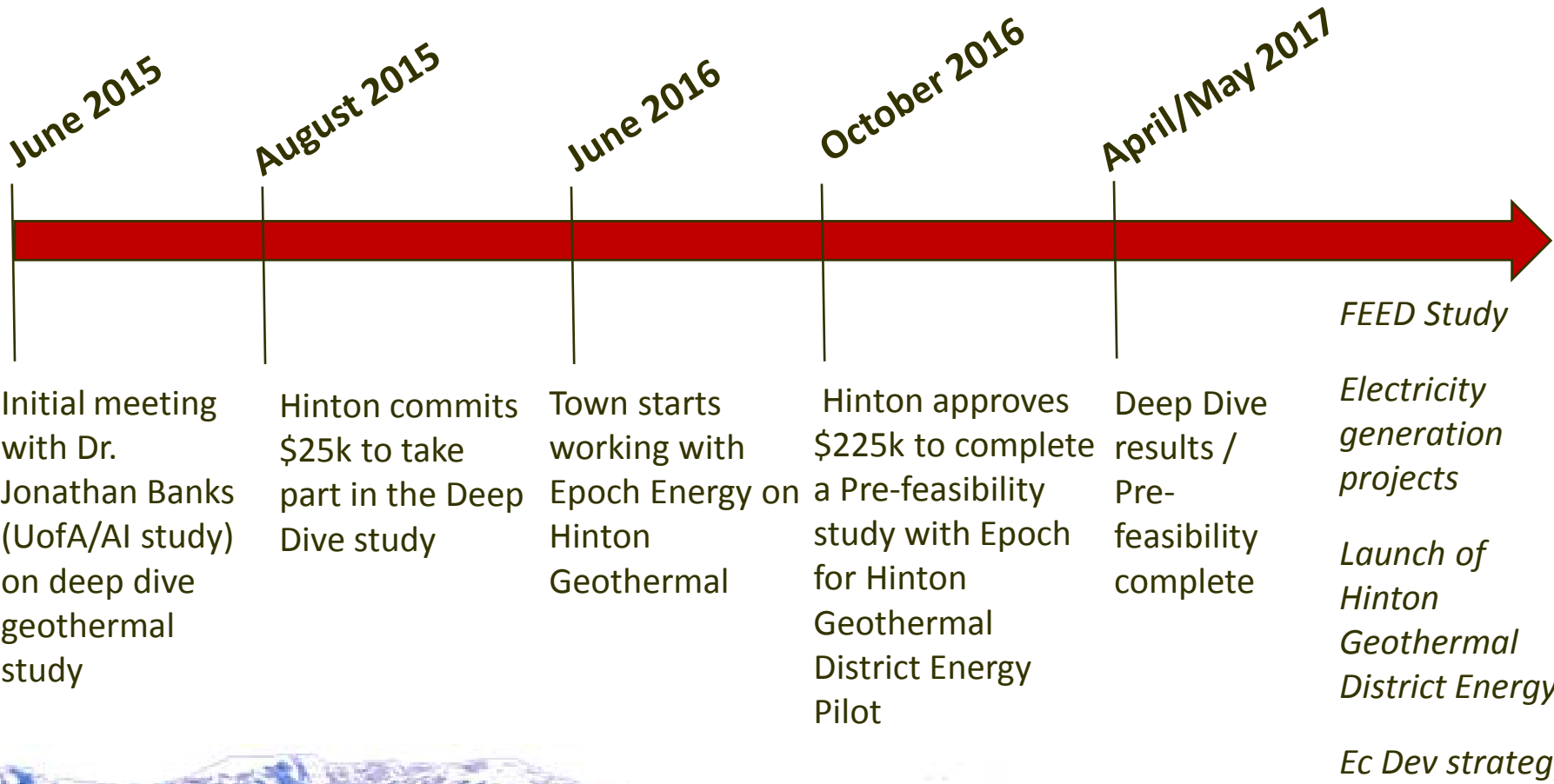


Bertani, Ruggero; Geothermal Power Generation in the World 2010-2014 Update Report; Enel Green Power, via Andrea Pisano, 120, 56122 Pisa (Italy)

A bit about Hinton?



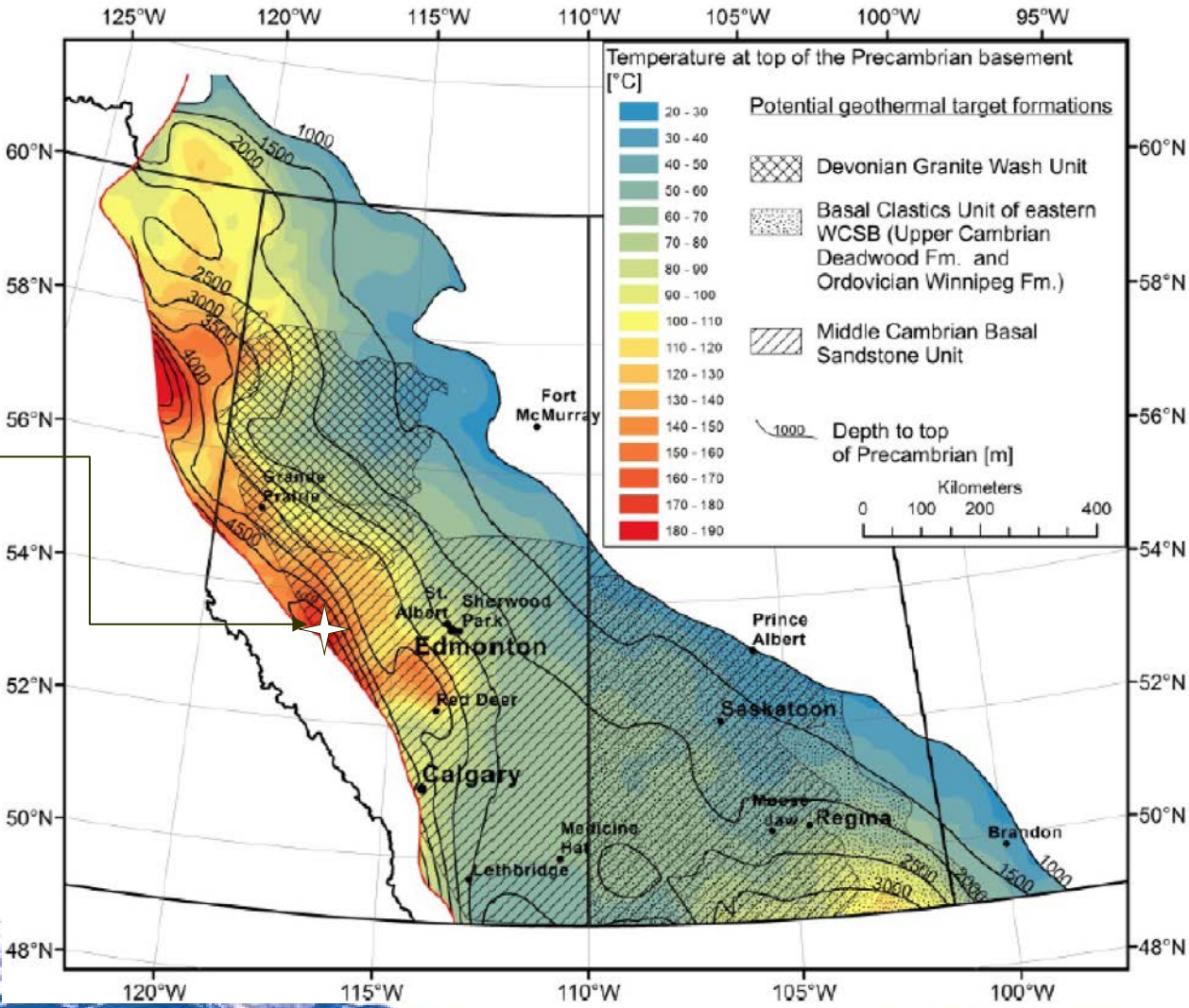
Our journey....so far



How 'Hot' is Hinton?

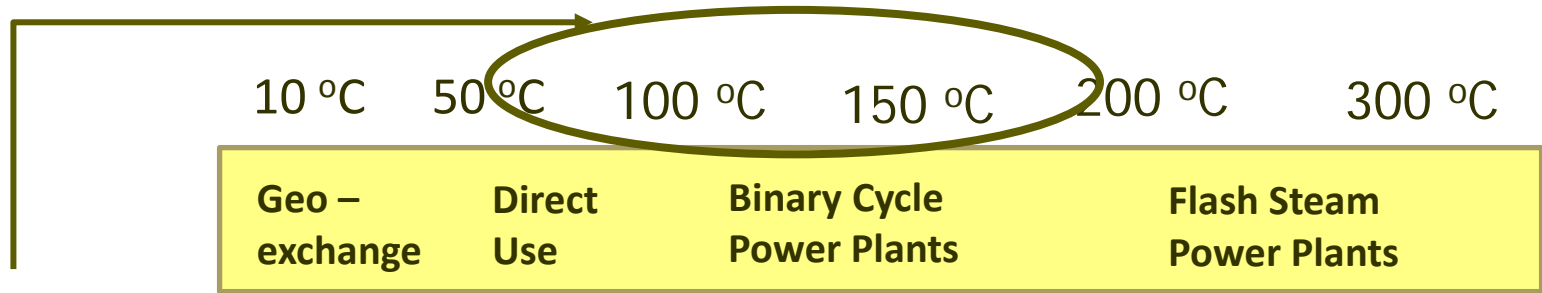


Hinton



From: Weides and Majorowicz, 2014

What is possible?



Hinton Range

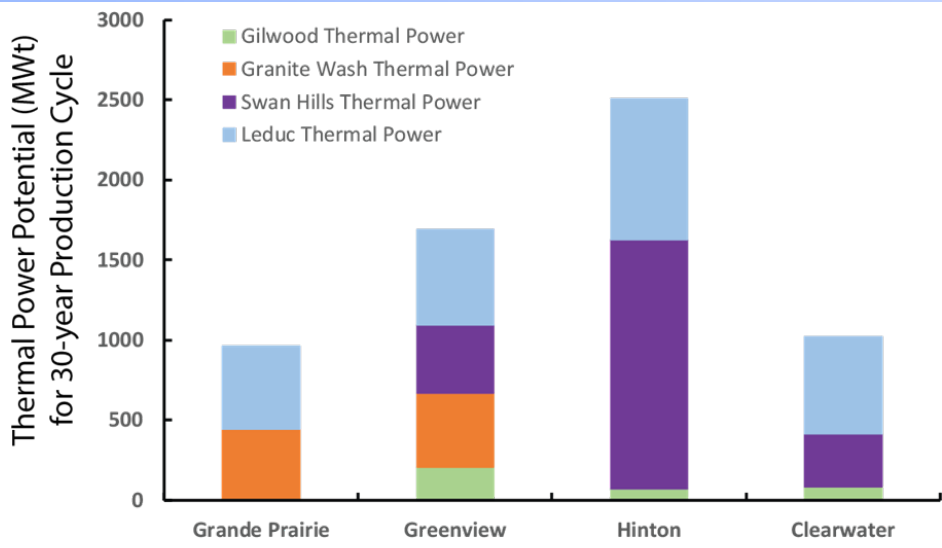
HEAT



ELECTRICITY

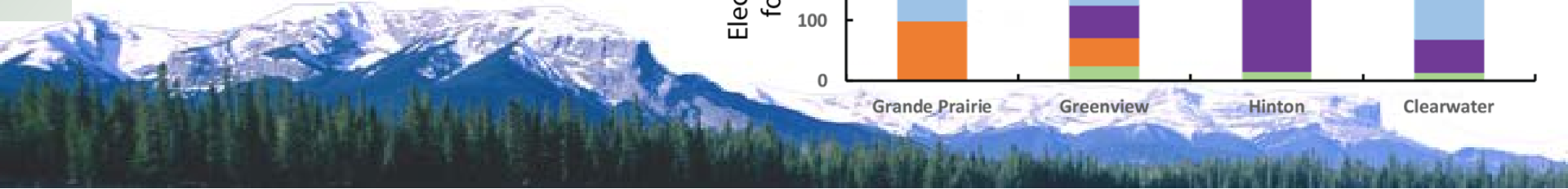
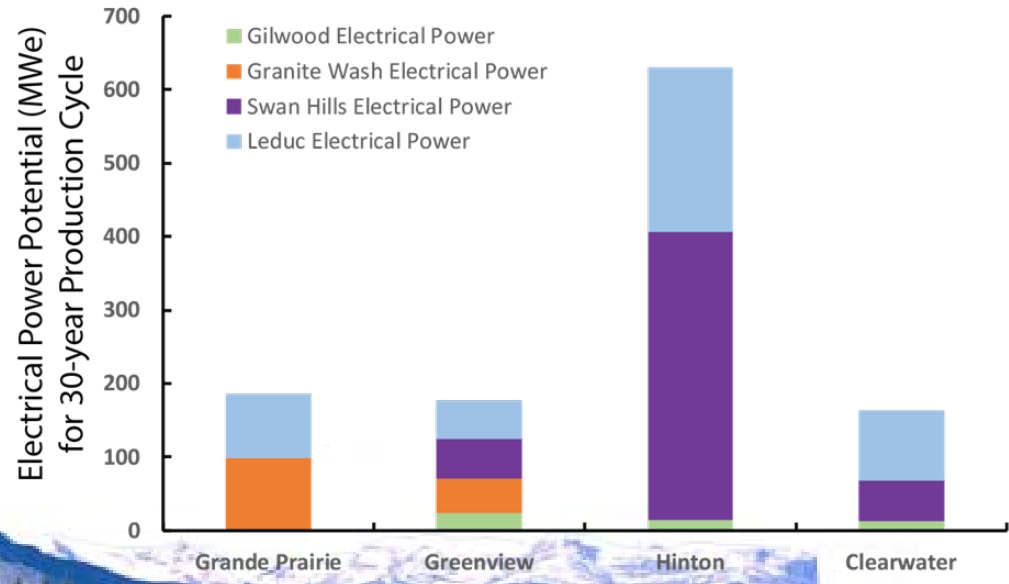


Deep Dive...Big Potential!



- The ~60,000+ GJ in the Hinton Geothermal Pilot equates to less than 3MWt. The potential in the Hinton area is more than 2,500 MWt

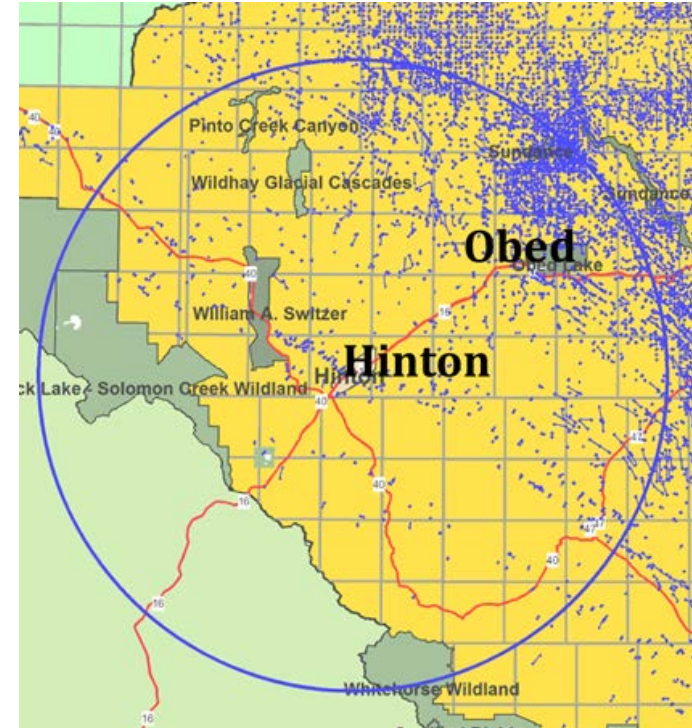
- The 600+MWe of potential electrical capacity is enough for over 500,000 single family homes
- The Obed area just outside of Hinton alone, has a potential capacity of over 50MWe. Enough power to support Hinton, Jasper & Banff National Park, and Switzer Provincial Park



What is Hinton Geothermal?



- Develop Hinton Geothermal District Energy for initially heat services to public buildings and new industries such as greenhouses, commercial/ industrial operations
- The **first** geothermal district **heating** system in Western Canada utilizing heat through thermal energy recovered from neighbouring O&G wells
- Reduce CO2 emissions, hedge future commodity costs
- Base-load, utility-grade, renewable heat, and we are proposing future electricity generation
- Increase the economic life of well bores with green energy production
- Deliver renewable energy, jobs and investment



Hinton Geothermal Project Partner



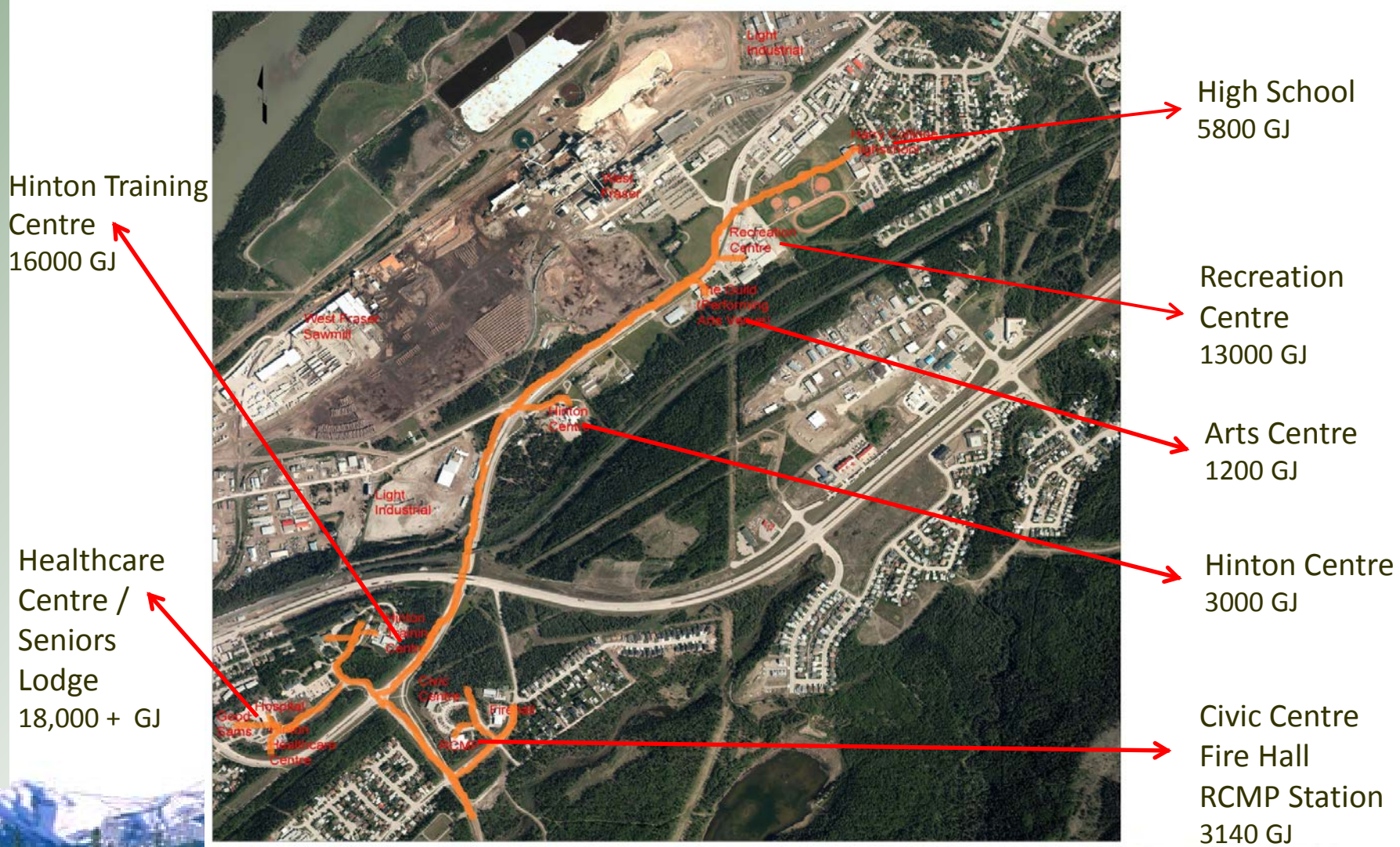
EPOCH ENERGY (www.epochenergy.ca)

Epoch Energy is an environmentally responsible energy company established to unlock heat energy in Alberta and Canada. Epoch commercializes geothermal resources in partnership with municipalities, First Nations, resource companies, industry, and food growers

- Enerpro Engineering
- Williams Engineering
- Stack'd Consulting
- Software
 - Direct heat modelling
 - GeoScout/AER Data
- Geology team:
 - Petroleum
 - Hydrogeologist
 - Geothermal/Heat flow modelling
- Engineering:
 - Reservoir
 - Drilling Completions
 - Abandonment
 - Facilities/Pipelines
 - Building



Hinton Geothermal Pilot Project



Annual heating consumption 60,000+GJ

Hinton Geothermal Pilot Project Customers



Annual heating consumption ~ 60,000GJ

Hinton Geothermal Pre-Feasibility Scope



Upstream: Geothermal Resource Production

- Research/data mining geothermal formations/resource potential & reservoir capacity
- Well analysis and cost analysis for viable for geothermal energy production
- Engage oil and gas operators of wells

Midstream: District Energy System

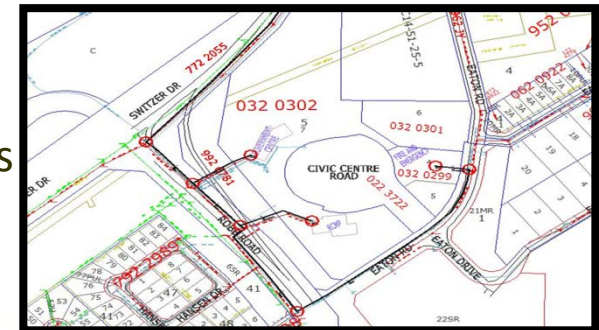
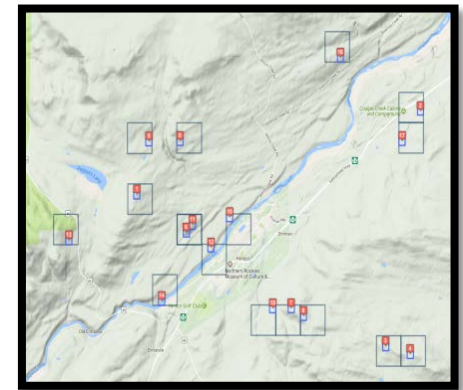
- Design & cost estimate of distribution system
- Identify risks/opportunities with facility options and locations
- Address regulatory requirements & schedule

Downstream: Customer Energy Services

- Interconnection and tier of prospective customers
- Identify thermal load and load profile: Design & Cost Analysis
- Energy Efficiency and GHG calculations for each facility

Project Financial Assessment

- Economic analysis of long-term project viability
- Levelized Cost of Energy and comparison with Natural Gas
- Full Greenhouse Gas reduction calculations



Hinton Geothermal *OPPORTUNITY*



- With millions of tourists visiting the Hinton-Jasper area annually, we have the opportunity to showcase the green-energy innovation and potential of Alberta
- Attract and develop *geothermal power generation* in the Hinton area
- Economic development/diversification driver for the regional economy and a strategic asset to attract and expand business (located on key transportation corridors, skilled workforce, favourable climate)
 - Attract new industry – heat intensive
 - Greenhouse development
 - Resorts
 - Competitive advantage for local industry
- An opportunity to build a leading centre of excellence around geothermal research and energy development



For more information:

Rob Mackin
Mayor

P: 780-865-6005
E: rmackin@hinton.ca

Mike Schwirtz
CAO

P: 780-865-6003
E: mschwirtz@hinton.ca

www.hinton.ca/hintongeothermal

