The GEothermie2020 Program
Supporting the Development of Geothermal Resources Use in Geneva Canton*

Marie Lecompte[1]

Search and Discovery Article #80714 (2020)**
Posted February 10, 2020

*Adapted from oral presentation given at 2019 AAPG European Region, 3rd Hydrocarbon Geothermal Cross Over Technology Workshop, Geneva, Switzerland, April 9-10, 2019
 DOI:10.1306/80714Lecompte2020

[1]Canton de Genève – Office Cantonal de l'Energie OCEN, Geneva, Switzerland (marie.lecompte@etat.ge.ch)

Abstract

Geneva aims to develop the use of geothermal resources. A country with no extractive industry past like Switzerland has very little information about its subsurface set up. The challenge of developing geothermal resources started from scratch. Geneva is characterised by massive use of fossil fuel for building heating, and high heating needs density, the option of using geothermal resources to reach the energy transition goals has been identified years ago (Geothermal potential of Geneva Canton, 2011). The government officially launched the GEothermie2020 program in 2013, with the aim to massively and sustainably develop geothermal resources in Geneva. The two main aspects that define the program are:

- a public led approach, where the administration (geological and energy departments mainly) pilots the implementation and the progress, and the public held utility company is in charge of financing and putting the plans into actions
- a holistic approach, where not only exploration of the geothermal resources is covered, but all aspects that will eventually result in the program's ultimate goal: regulation, environment and sustainability, cross border cooperation, communication and public acceptance, data collection, analysis and management, market development and ultimate use of the resources Switzerland political system and culture is characterized by systematic use of direct democracy.

As such, the public's interest in societal matters is high, and population expectations in terms of information and public debates can strongly influence policies decisions making. The GEothermie2020 program was driven from day one by these considerations, and presents an

interesting example of agility, collaboration, and progressive derisking of the use of geothermal resources, to eventually grant success to the development of that resource. In a dynamic of local wealth creation, the program initially relied on regional academic skills to compile existing data, before turning to service providers sometimes from the oil and gas world. The program continues today to rely on the know-how of these actors but also seeks to participate in the development of specific and complementary skills required in the field of geothermal energy and underground water exploration and exploitation.

Reference Sited

Quiquerez, L., B. Lachal, M. Monnard, and J. Faessler, 2016, The Role of District Heating in Achieving Sustainable Cities: Comparative Analysis of Different Heat Scenarios for Geneva: The 15th International Symposium on District Heating and Cooling, September 4-7, 2016, Seoul, Republic of Korea (South Korea), 8 p. DOI:10.1016/j.egypro.2017.05.057

The GEothermie2020 program

Supporting the development of geothermal resources use in Geneva canton

AAPG 3rd Hydrocarbon Geothermal Cross Over Technology Workshop
9-10april 2019

REPUBLIQUE
ET CANTON
DE GENEVE

POST TENEBRAS LUX

Marie Lecompte
Canton de Genève – Office Cantonal de l'Energie OCEN

GEOTHERMIE
2020

SIG

Energy policy goals

GEOTHERMIE 2020

Energy transition targets in 2035 and 2050

Set by the **canton**, in line with the **Confederation**

CO2, energy consumption reduction targets

Develop **local** and **renewable** energy resources

Develop **infrastructures**

Control and **decrease** the energy consumption

REPUBLIQUE ET CANTON DE GENEVE

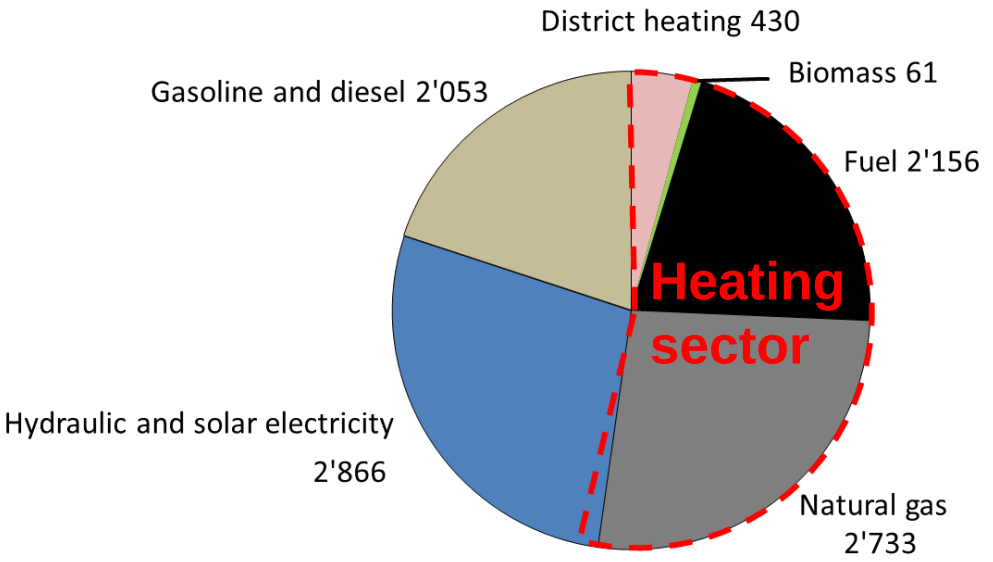
POST TENEBRAS LUX

SIG

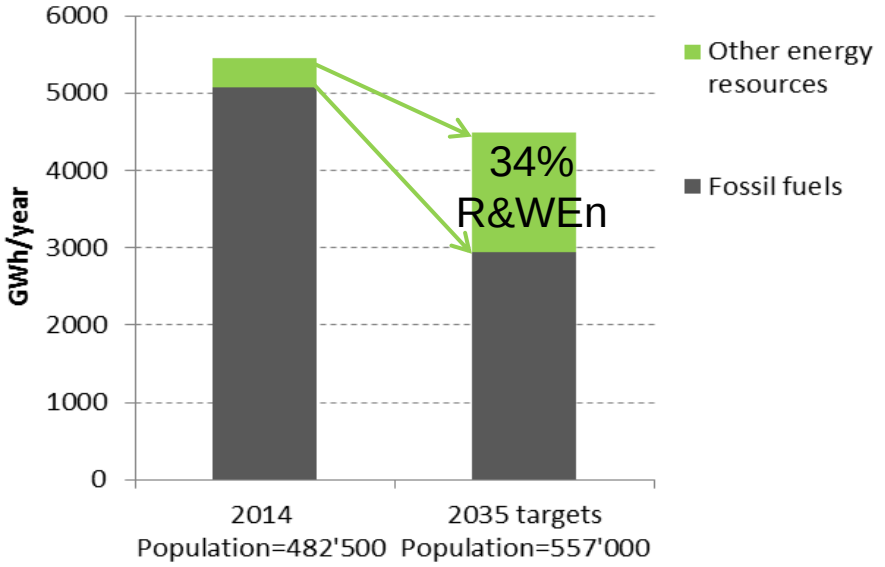
Energy consumption: distribution by sector and forecast for heating

GEOTHERMIE 2020

2014: Final energy consumption in the Canton of Geneva (GWh/yr)



2014 to 2035: Energy policy targets for heating sector



Total energy consumption c. 10'300GWh
Heating sector represents more than 50%, mainly gas and heating oil

Targets:
- Energy consumption decrease by -18%
- Fossil fuel consumption decrease by -42%

Large potential for CO2 emission reduction – targeting heating sector

Source: Quiquerez, L. et al. (2016)

REPUBLIQUE ET CANTON DE GENEVE
POST TENEBRAS LUX

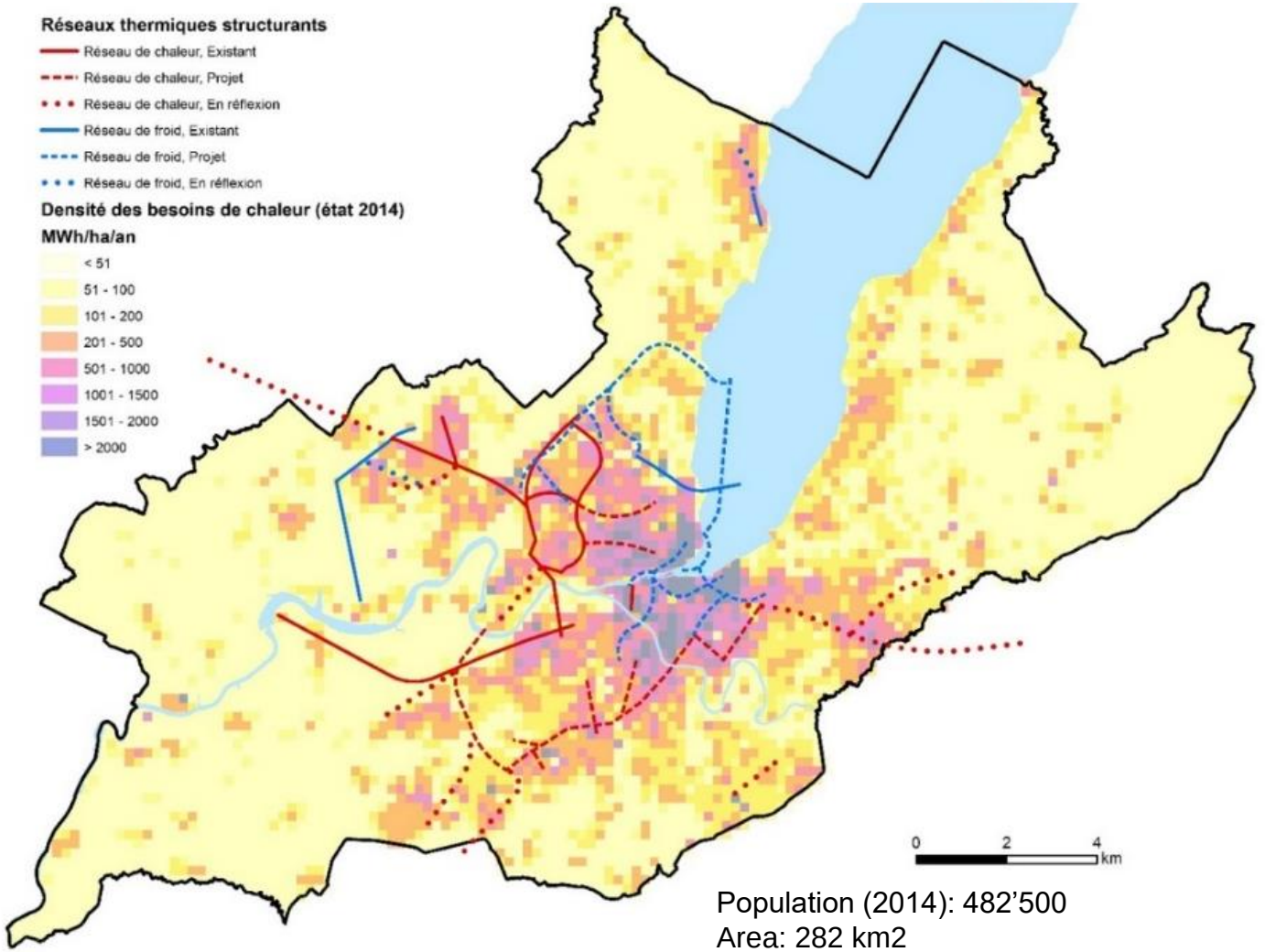
UNIVERSITÉ DE GENÈVE

SIG

Heating demand distribution

GEOTHERMIE 2020

- 70% of heating demand in heating density areas of over 500 MWh/ha/year
- Favourable context for district heating network implementation



Population (2014): 482’500
Area: 282 km2

REPUBLIQUE ET CANTON DE GENEVE
POST TENEBRAS LUX

SIG

« Geothermie2020 »: a transversal approach led by the canton and SIG

What is the **geothermal potential**? How could it be integrated in the **energy system**?

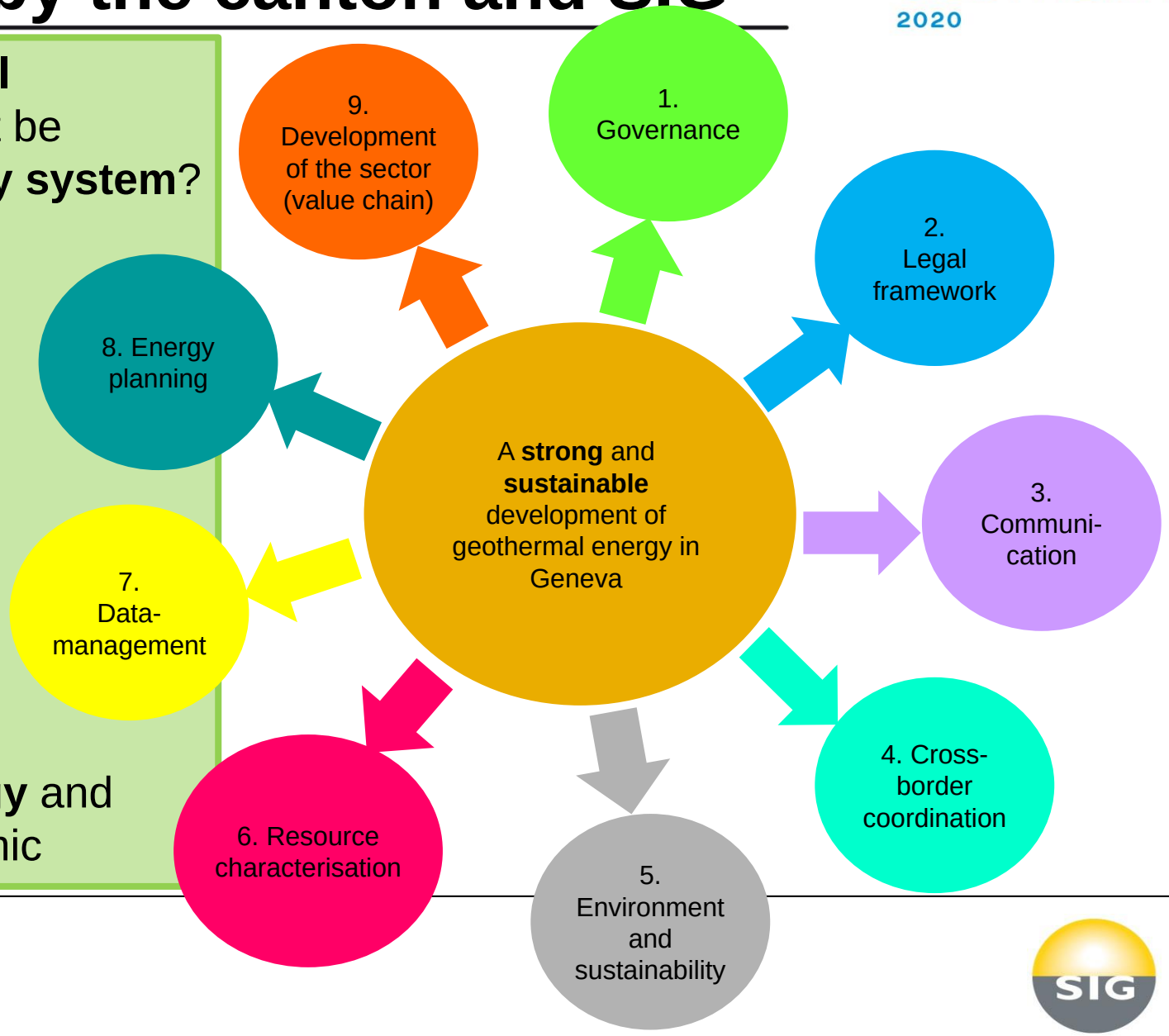
Geothermie2020:

- 1 vision
- 9 strategic focus

State: Geneva Canton

Utility company: SIG

=> Coordinated **strategy** and **implementation** dynamic

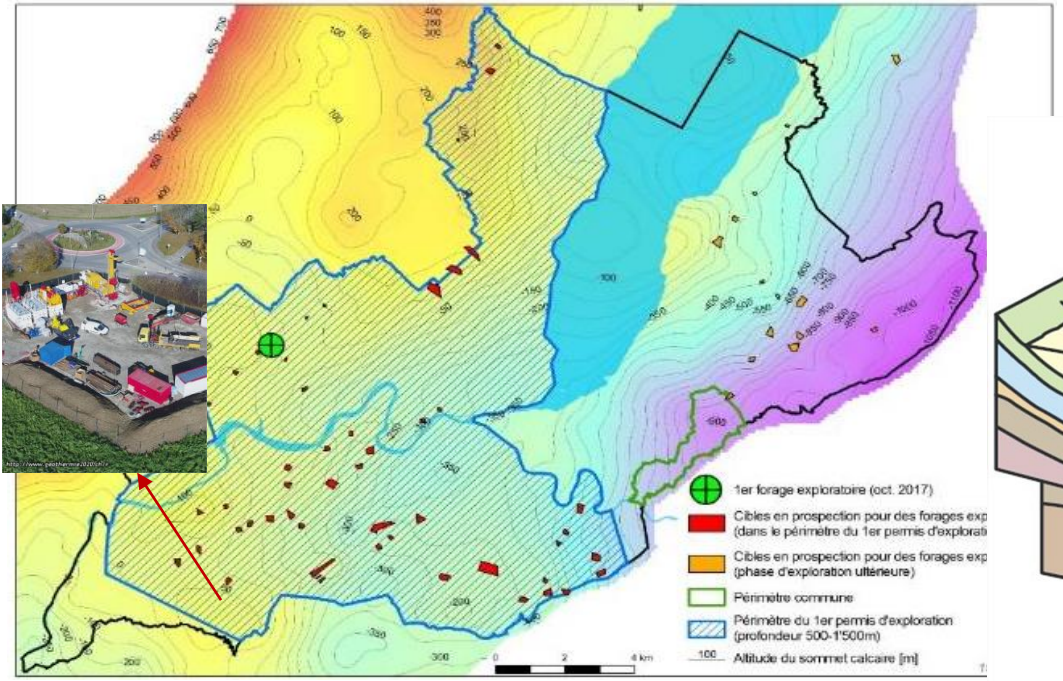


REPUBLIQUE ET CANTON DE GENEVE
POST TENEBRAS LUX

Investigation of the geothermal potential

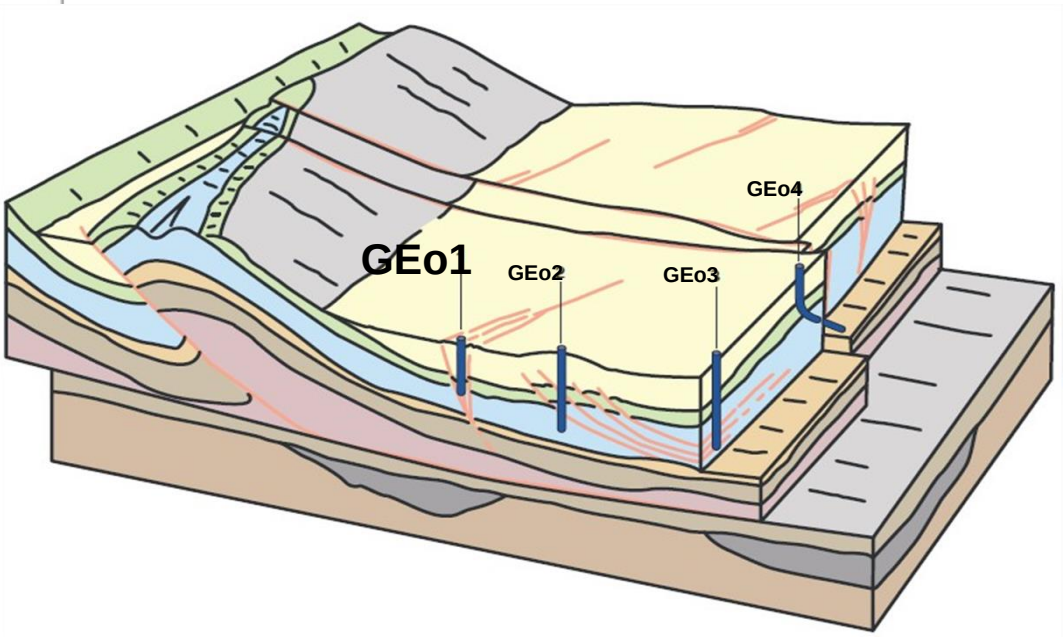
GEOTHERMIE 2020

Many potential targets identified and partially mapped



Future operations (2019-2021)

- 3D seismic survey (220km2)
- 3 exploration wells to test different structural contexts (GEo2-3-4) between 1’000 and 1’500m



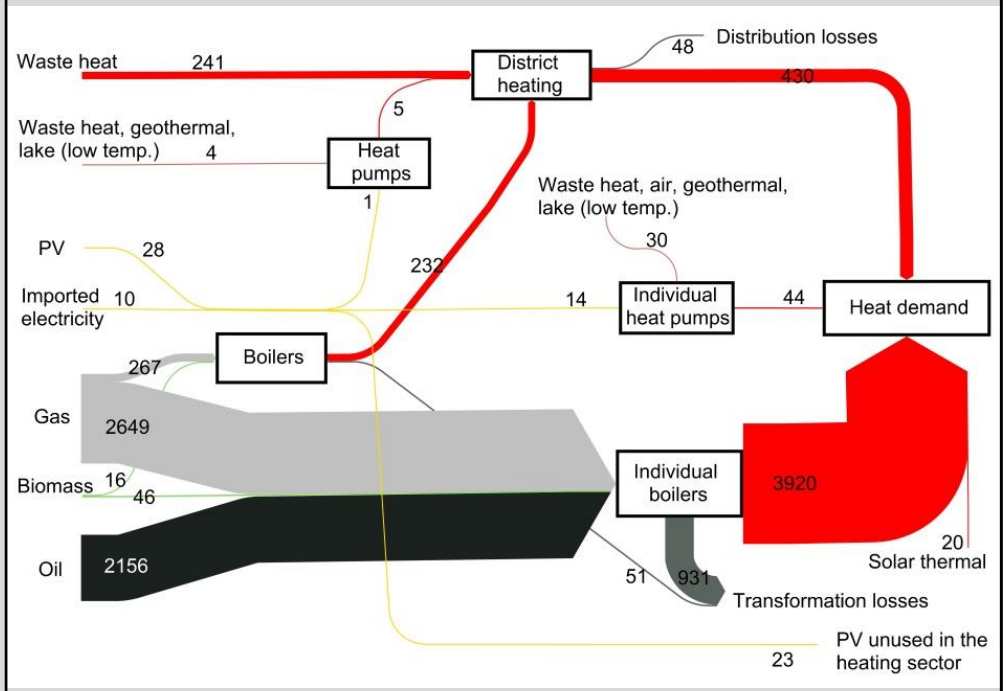
REPUBLIQUE ET CANTON DE GENEVE

SIG

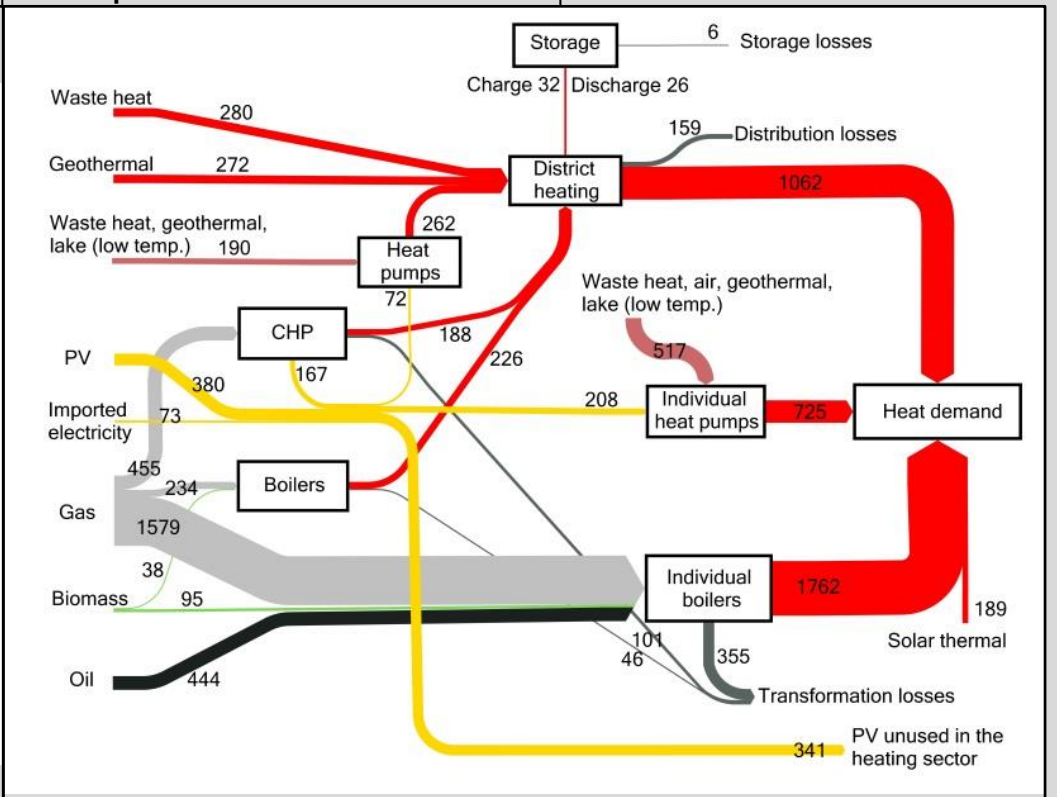
Heat distribution modelling and forecast

GEOTHERMIE 2020

2014 (GWh/y)
Population 482’500



2035
Population 557’000



GWh/an en 2035
Source: Quiquerez, L. et al. (2016)

REPUBLIQUE ET CANTON DE GENEVE

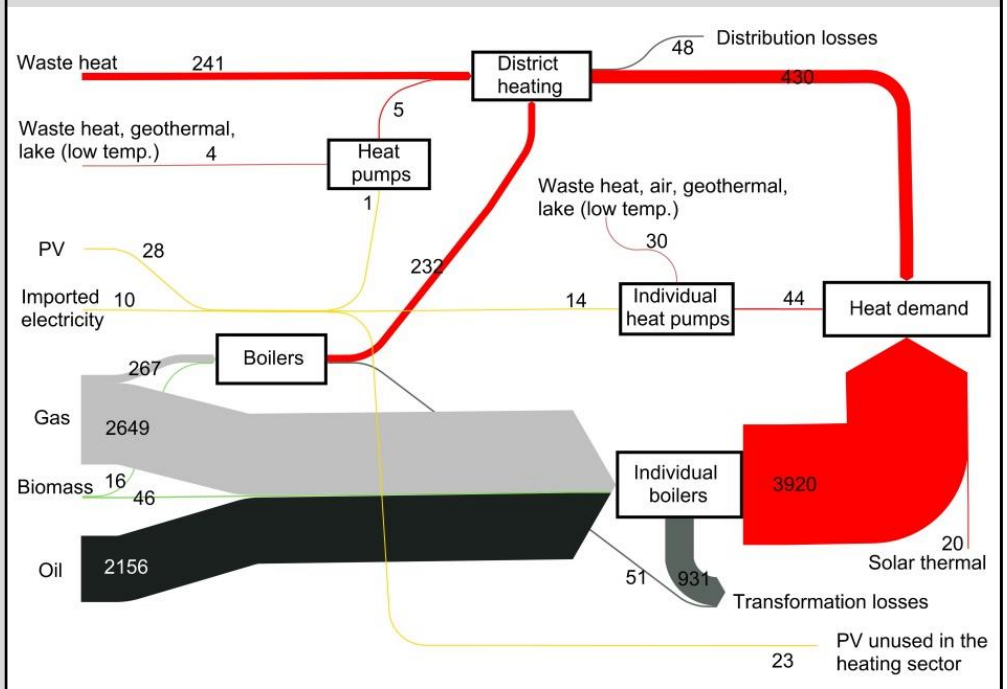
UNIVERSITÉ DE GENÈVE

SIG

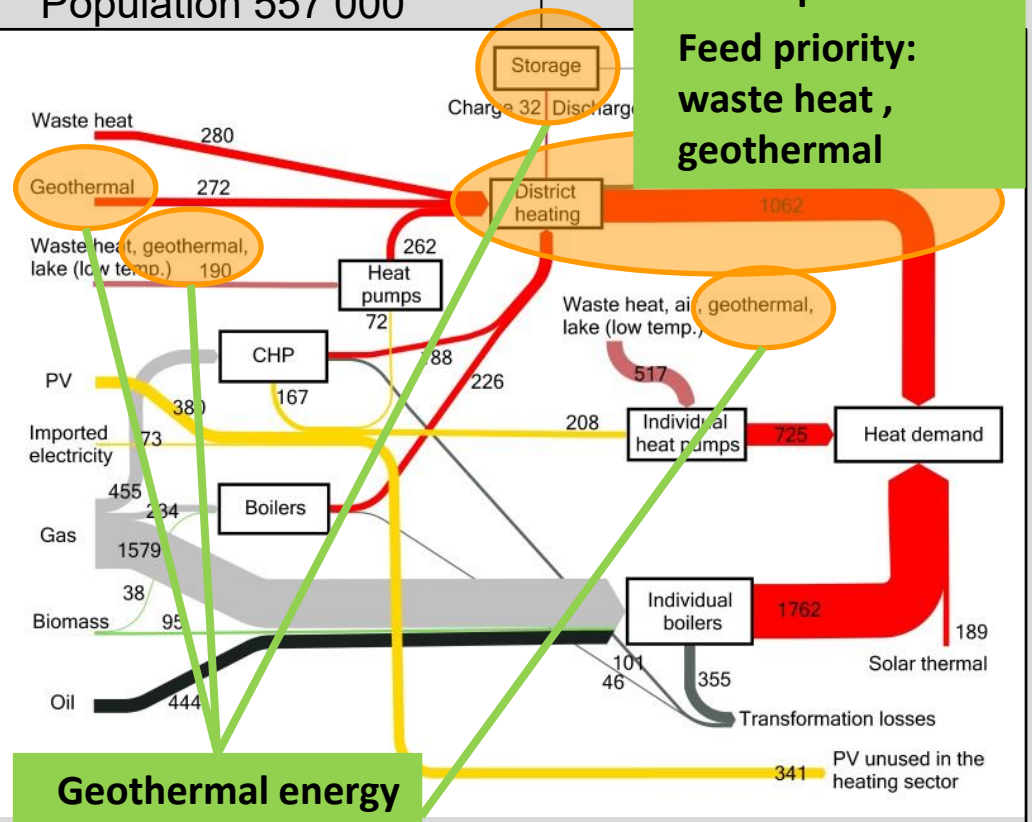
Heat distribution modelling and forecast

GEOTHERMIE 2020

2014 (GWh/y)
Population 482'500



2035
Population 557'000



District heating development

Feed priority: waste heat , geothermal

Geothermal energy integration and use

GWh/an en 2035
Source: Quiquerez, L. et al. (2016)

REPUBLIQUE ET CANTON DE GENEVE

UNIVERSITÉ DE GENÈVE

SIG

Merci de votre attention!

Thank you for your attention

Contact:
marie.lecompte@etat.ge.ch

Pour plus d'information:
www.geothermie2020.ch
www.ge.ch/parcourir#territoire_et_environnement-energie