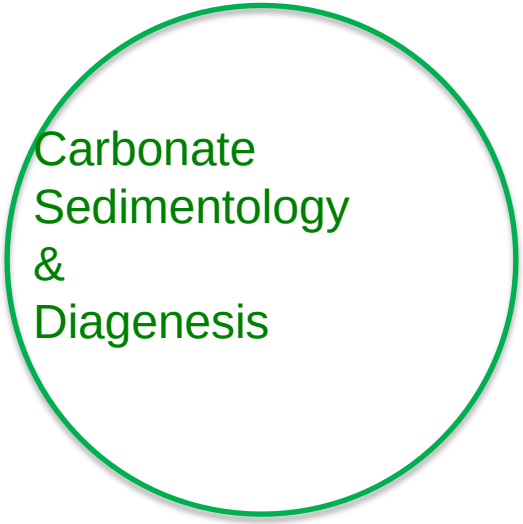
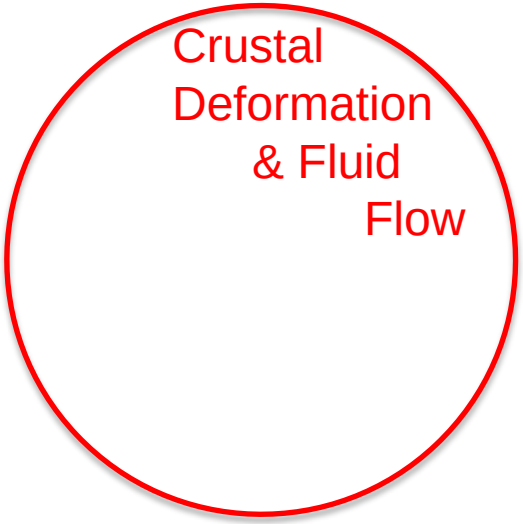
Future of hydrothermal applications and heat for the districts

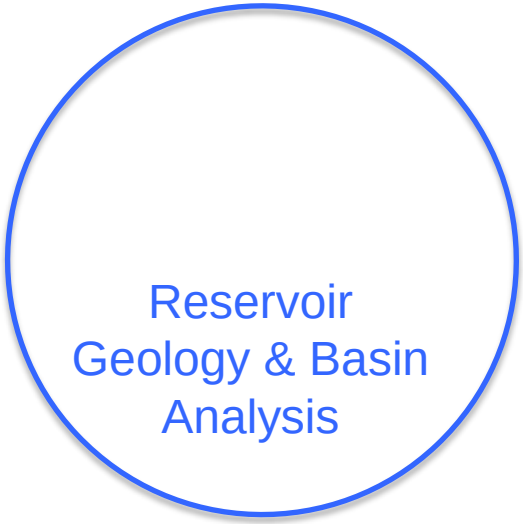
Dr. Michel Meyer

Source OCEN - DALE





GeoEnergy Group



Climatical issues

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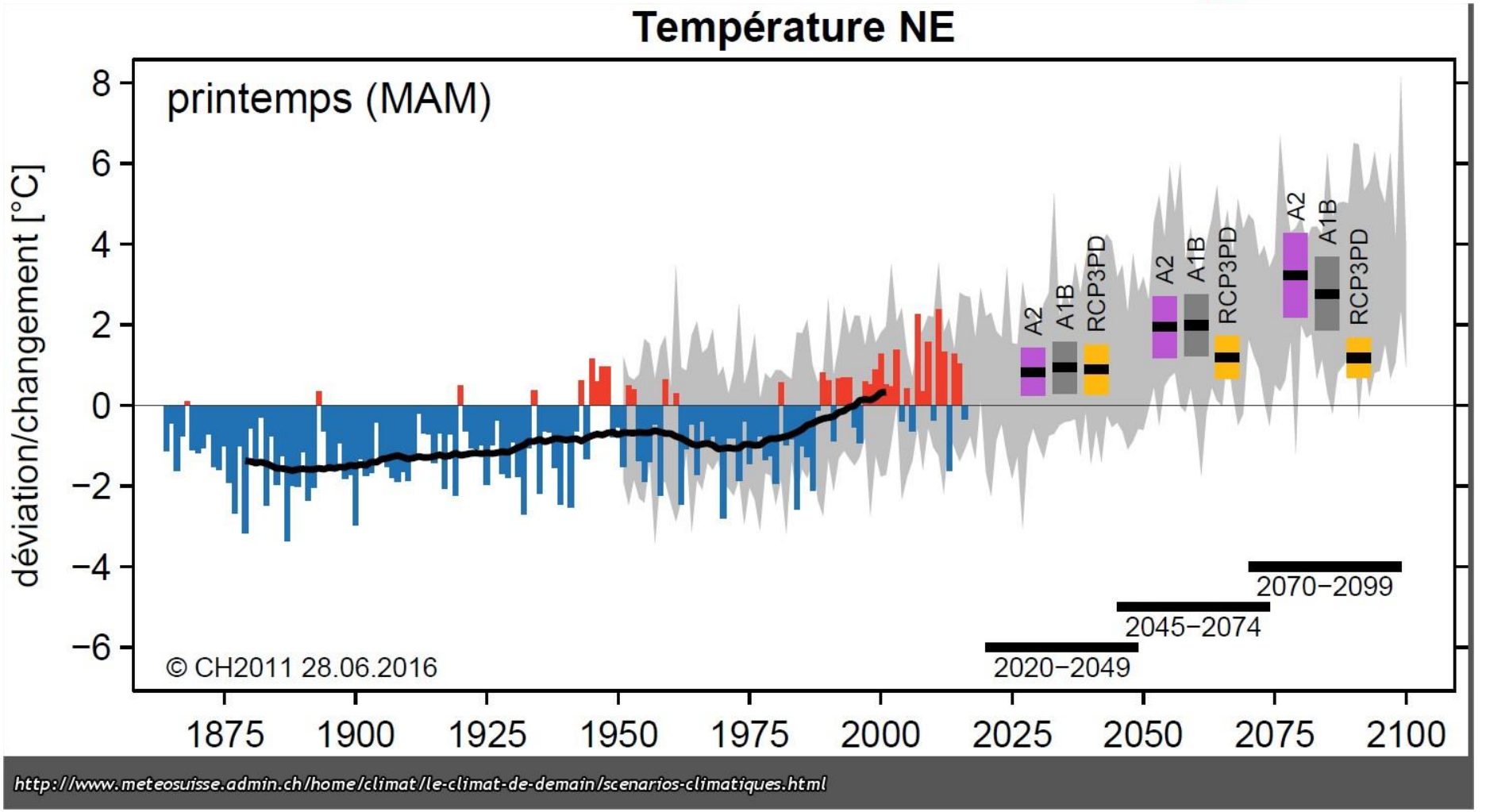

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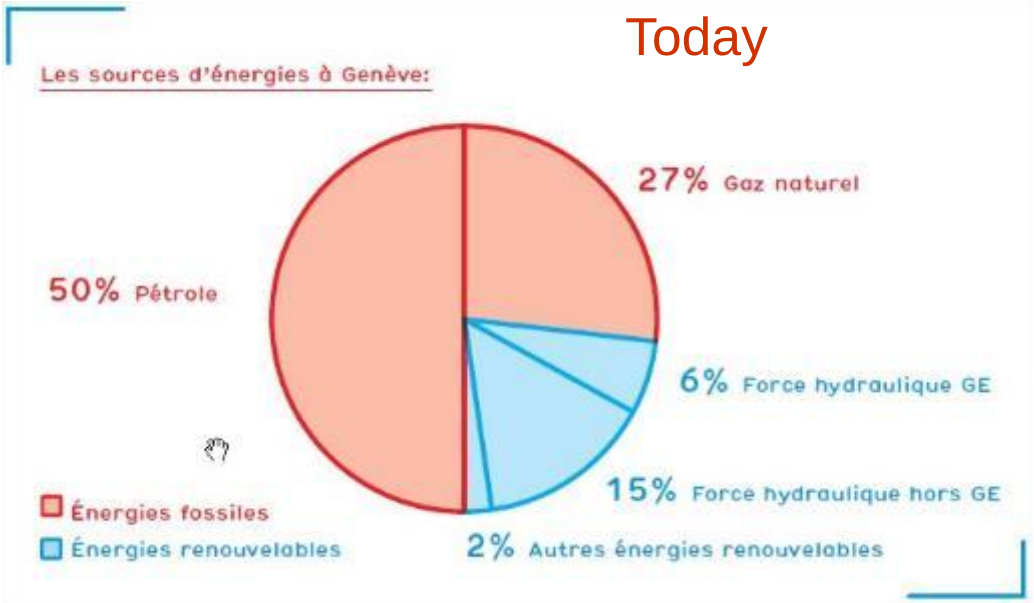
Energetical issues

- Massive reliance on fossil fuels
- Energy supply comes from more than 90% from outside the canton

Today



Future

Geneva energy strategy validated by the State Council in 2013:

→ Development of renewable energies

→ Geothermal energy is the most promising source of renewable energy for Geneva in particular for his high potential for **heat production**.

The world of heat production and distribution
Incresingly decentralized ….

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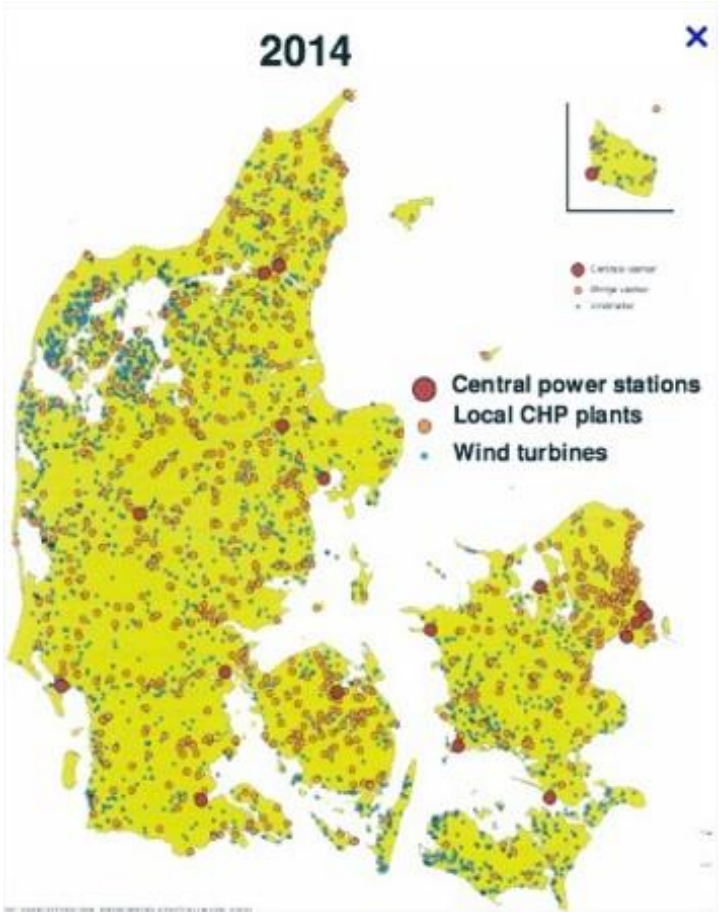

Lauersen, 2014

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The world of heat production and distribution
Incresingly decentralized …. And less hot

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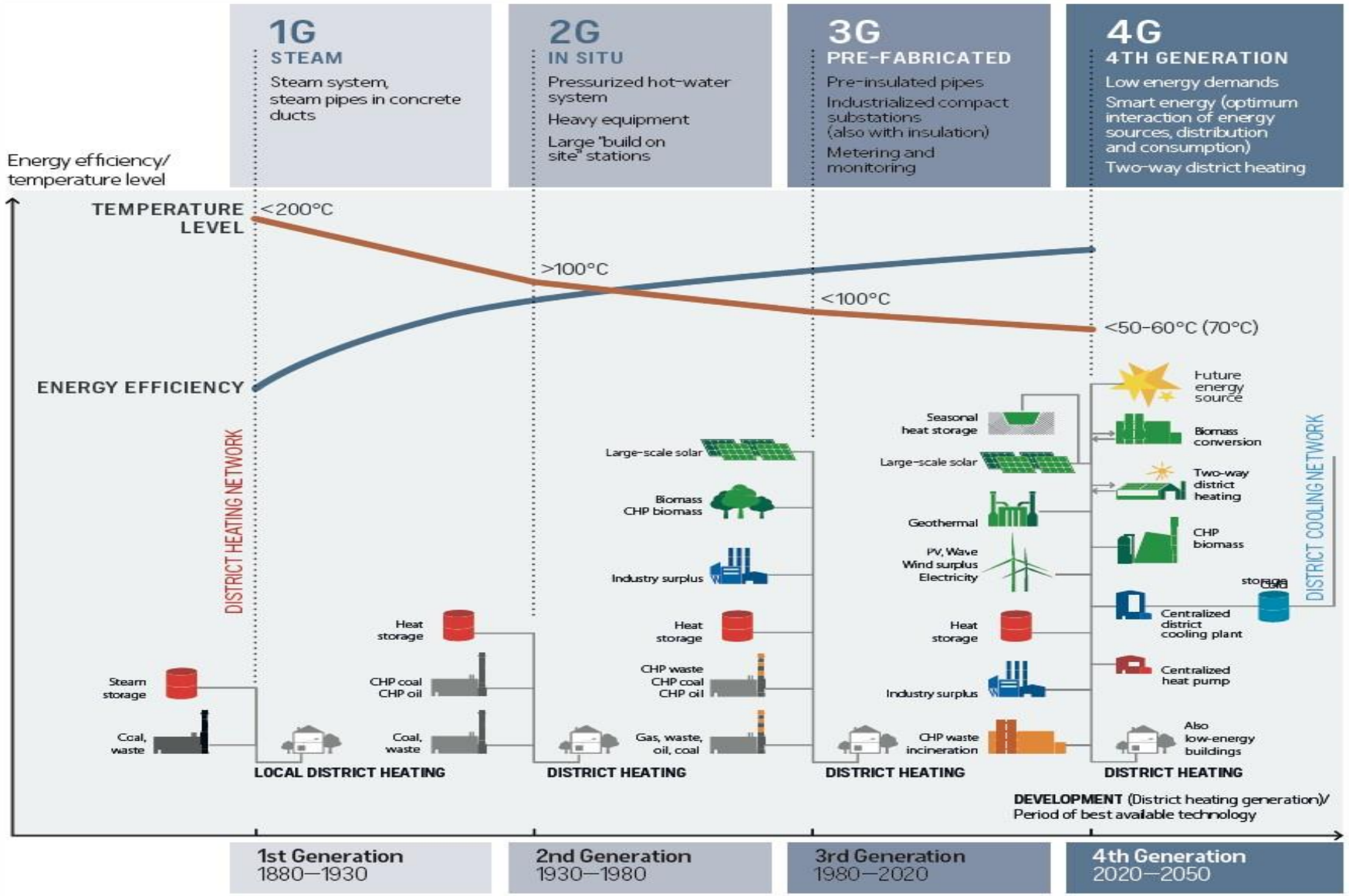
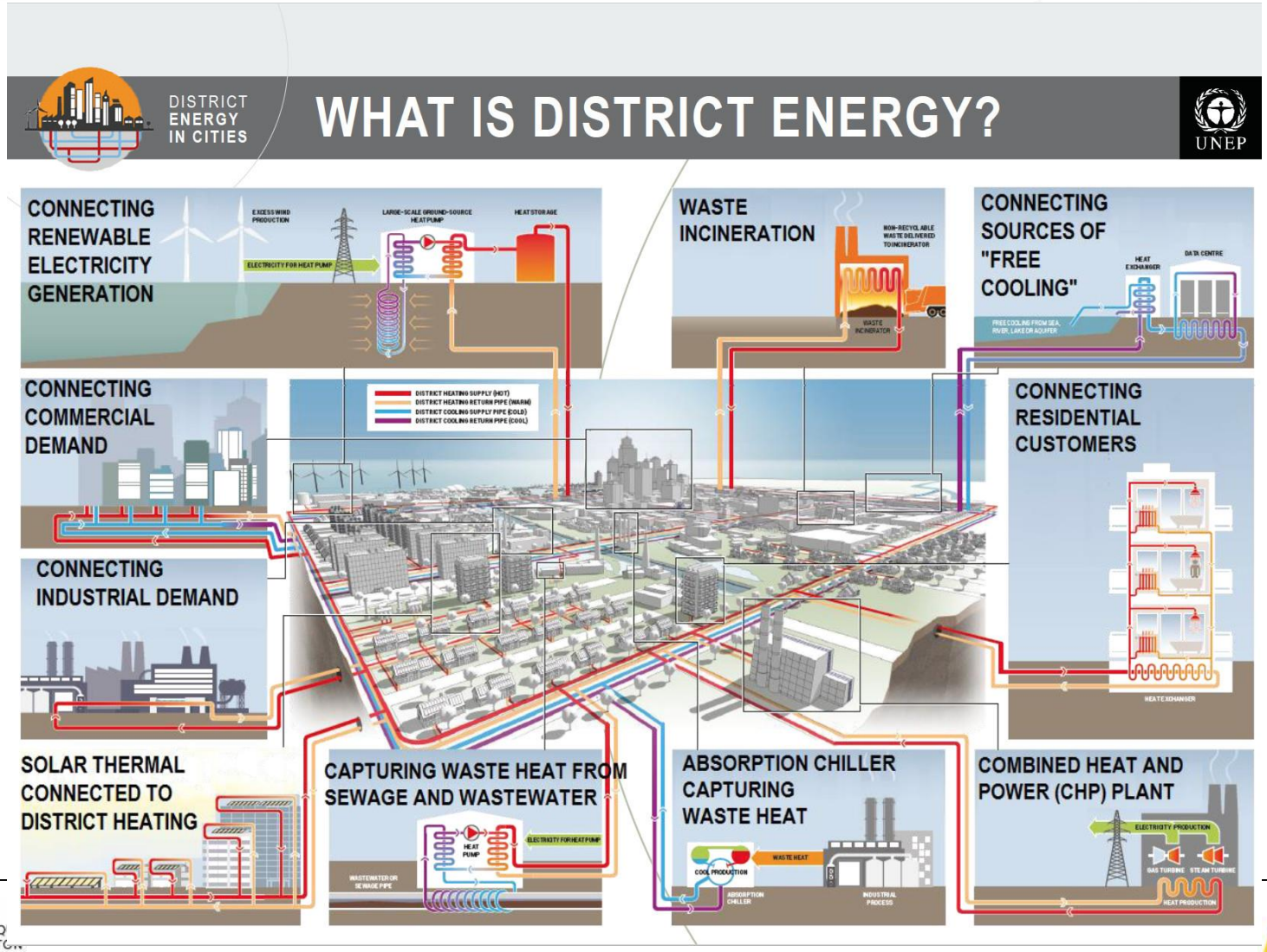


Source: Aalborg University and Danfoss District Energy, 2014

The complexity of modern energy systems
High level of heat and electricity coupling



Source : http://www.districtenergyinitiative.org/

Geothermal Energy in the future : coupling different ressources for heating, cooling and storage

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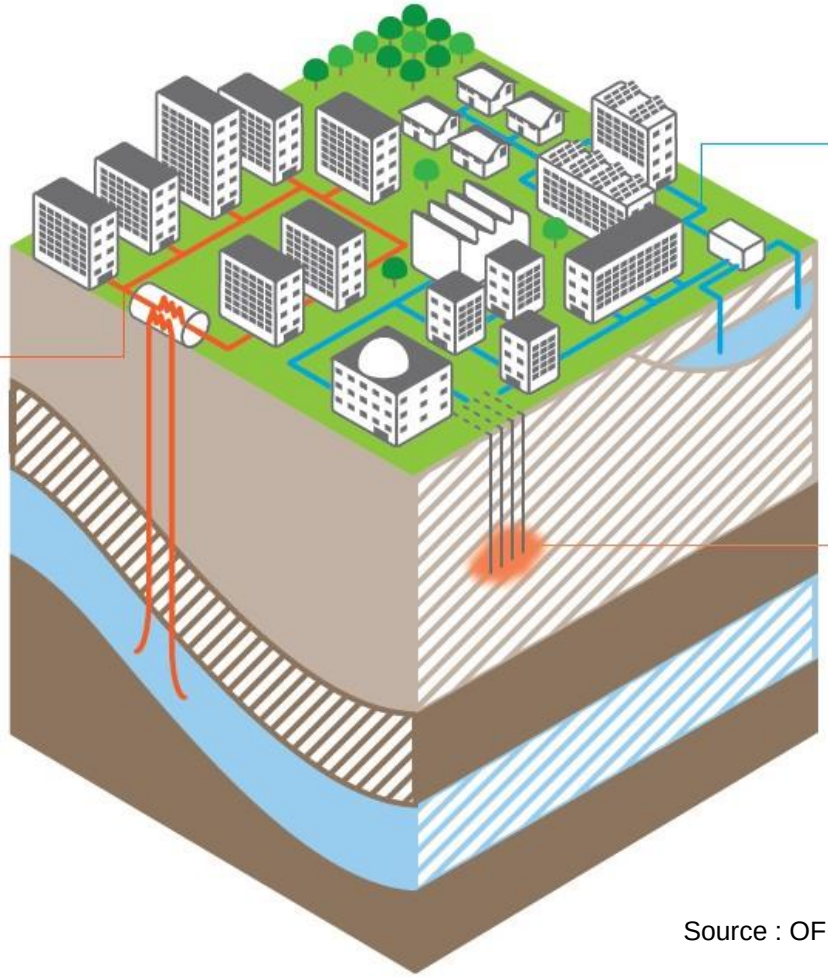
Réseau moyenne et haute température

La géothermie de moyenne et grande profondeur fournit la majeure partie de la chaleur du réseau. Les bâtiments anciens ont besoin d'un niveau de température élevée. L'utilisation de PAC n'est pas obligatoire mais peut permettre de mieux valoriser la géothermie.



Réseau à basse température

Les bâtiments à basse consommation ont besoin d'un niveau de température modéré. La géothermie fournit de la chaleur et permet d'en stocker (rejets thermiques industriels, solaire thermique, etc.). La géothermie fournit aussi du rafraîchissement. L'utilisation de PAC est nécessaire et permet d'optimiser le système.

Stockage géothermique

Le sous-sol à faible, moyenne et grande profondeur ainsi que les eaux souterraines peuvent servir de stockage géothermique. L'utilisation d'une énergie produite (chaud ou froid) est différée et rendue disponible au moment le plus propice.

Source : OFEN

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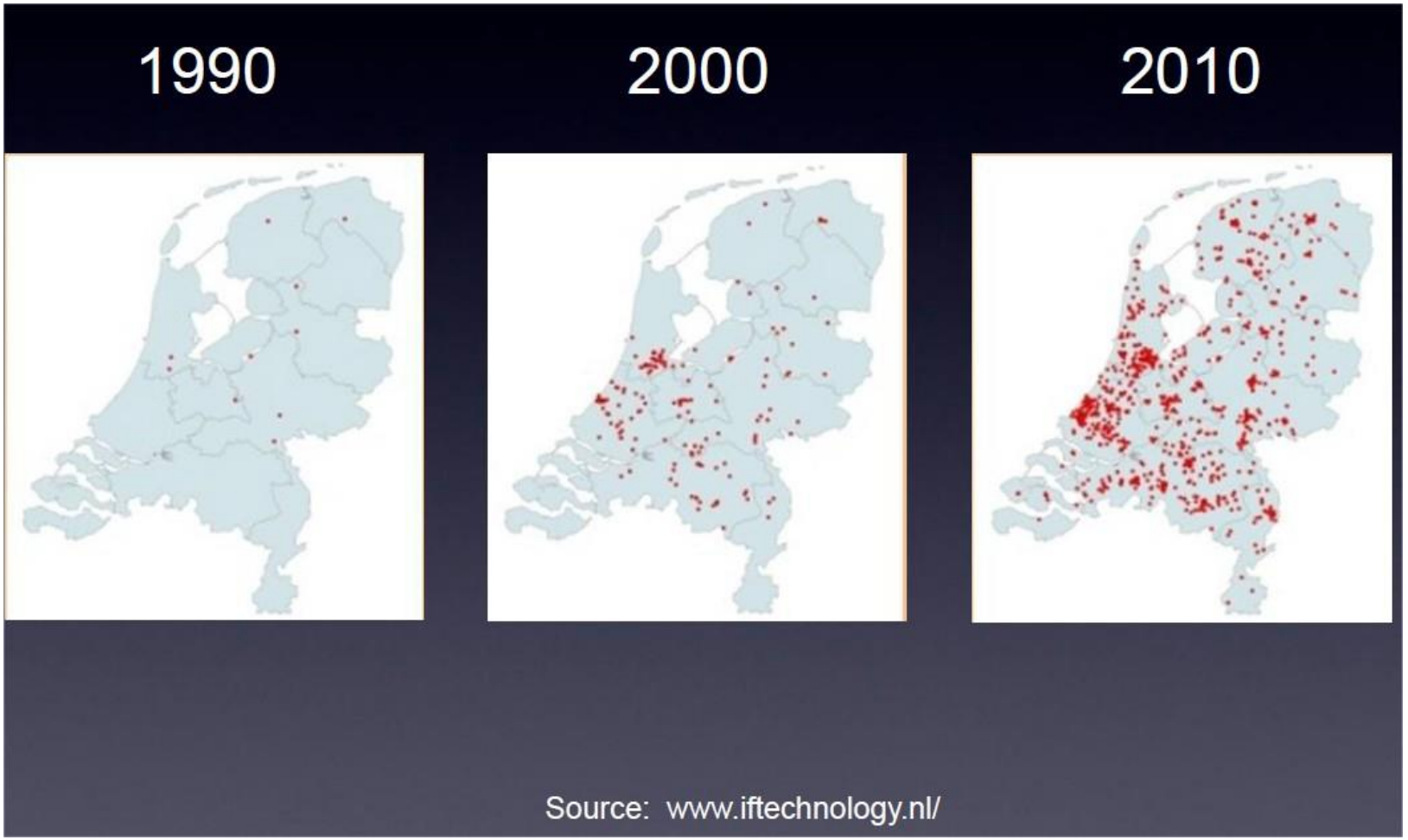
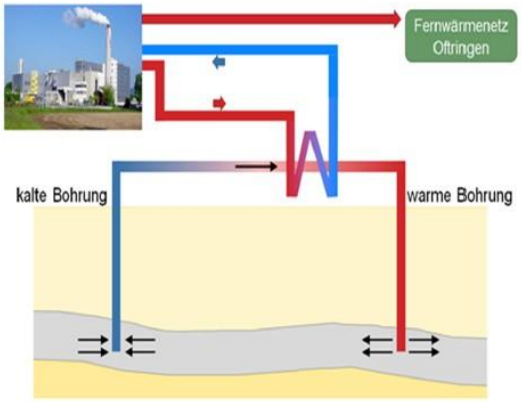
ATES growth in the Netherland



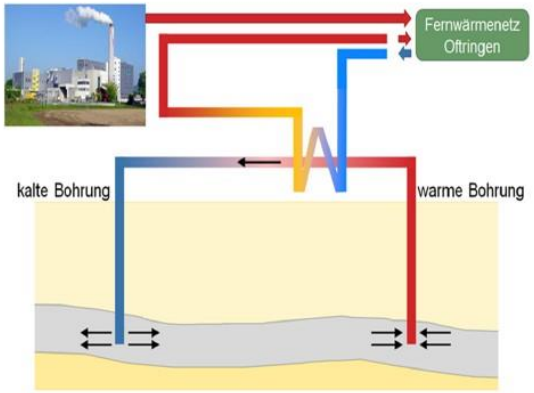
Possibilities for high T°C storage at medium depth

GEOTHERMIE 2020

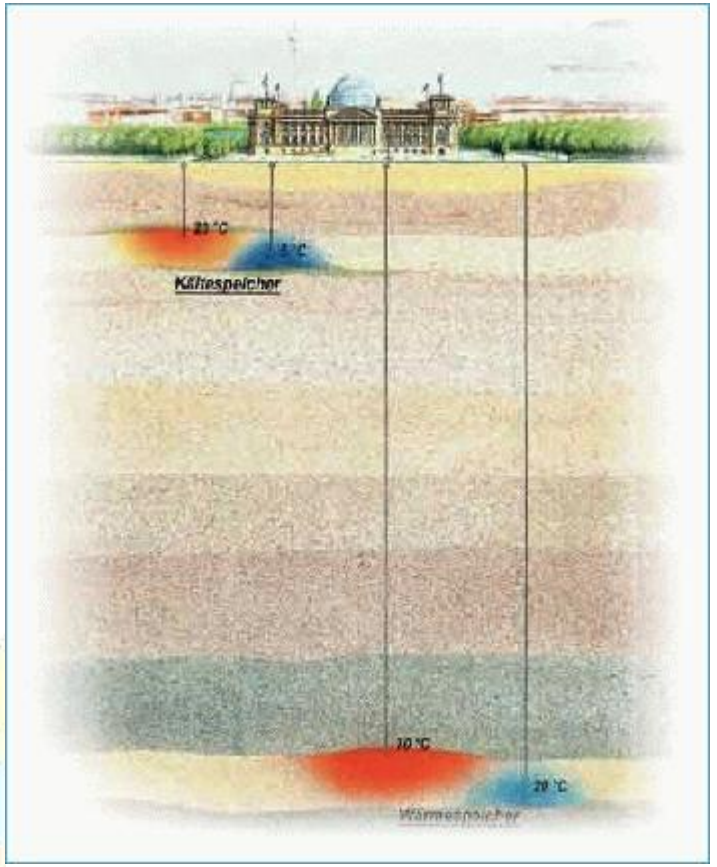


Source Erdwärme Oftringen

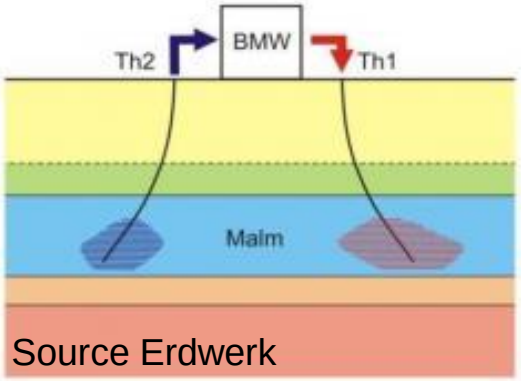
Sommerbetrieb



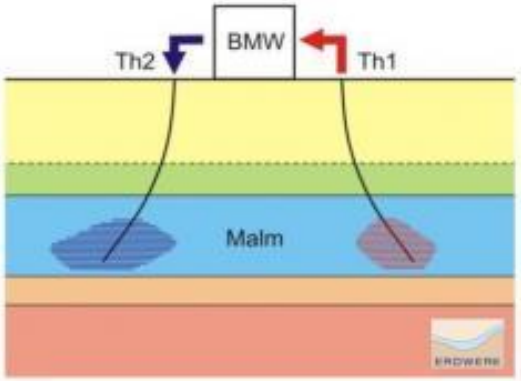
Winterbetrieb



Sommer-Halbjahr: Beladung



Winter-Halbjahr: Entladung



Source Erdwerk

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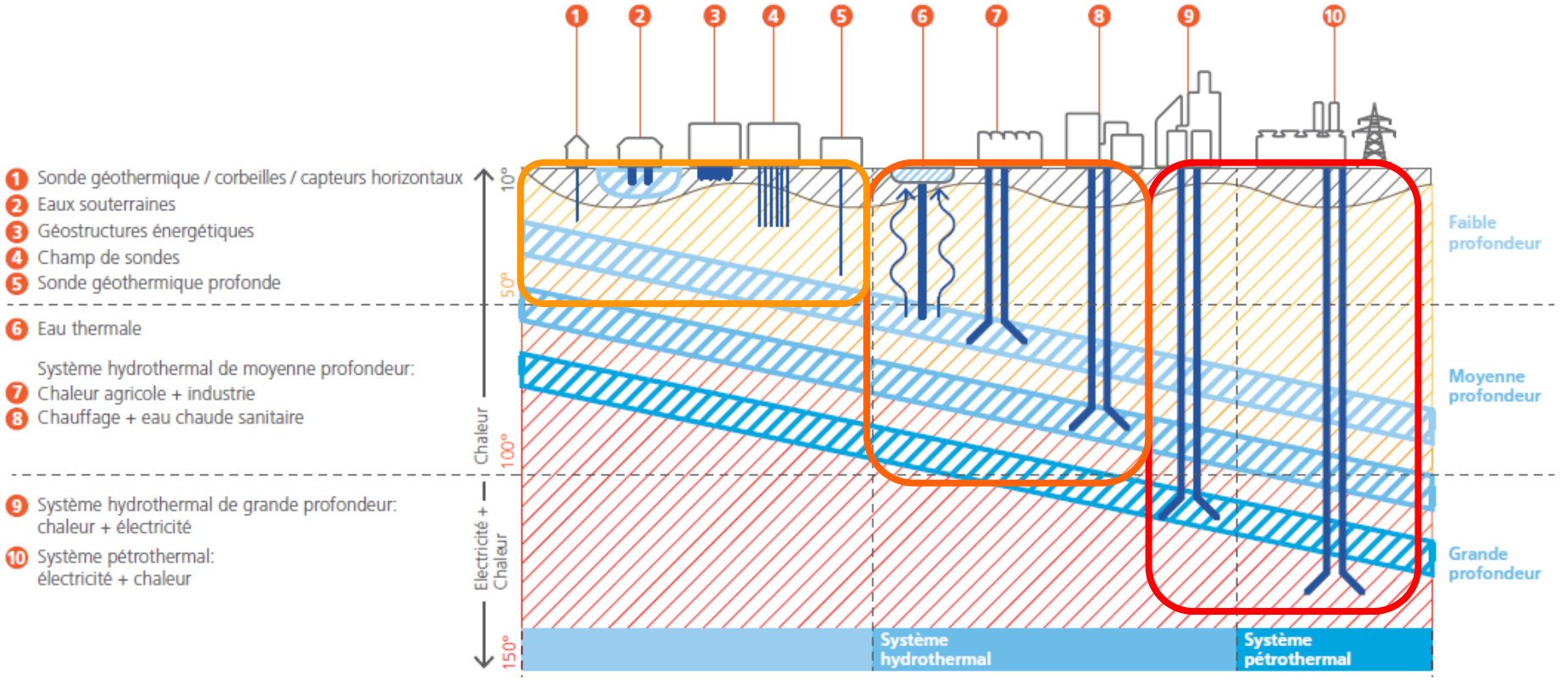
Many geothermal possibilities in Switzerland
Especially in hydrothermal systems

GEOTHERMIE 2020



Source : OFEN

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What could be done in Geneva

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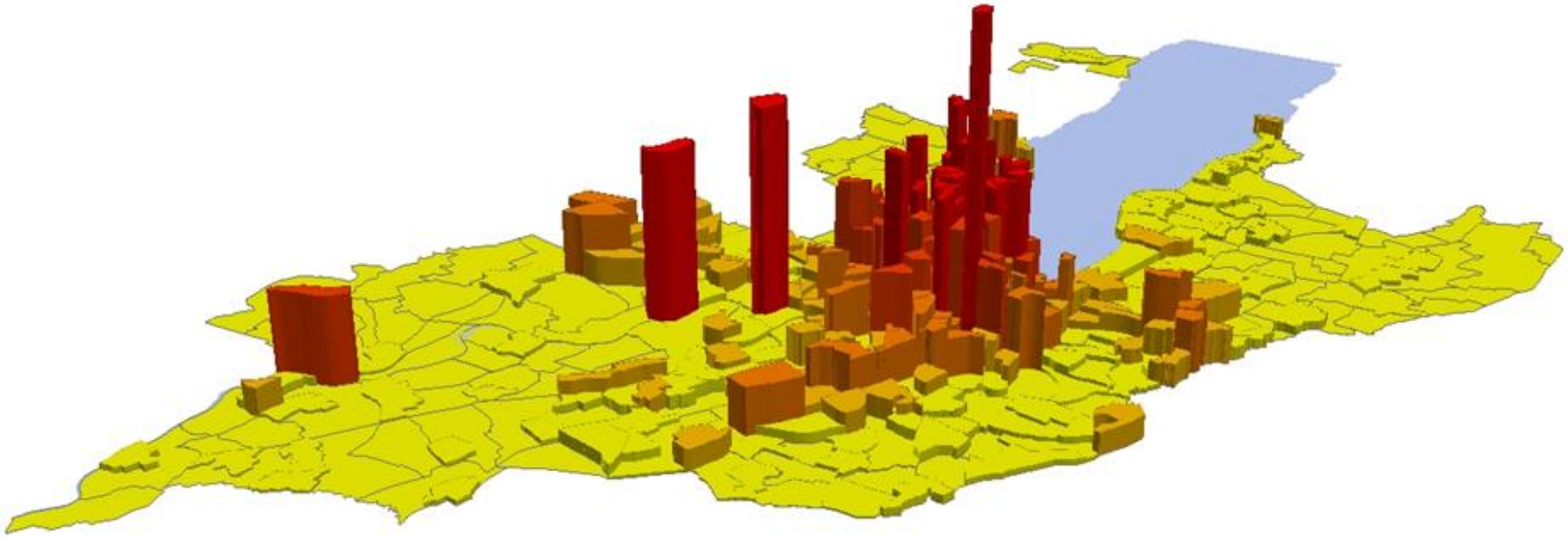

Source OCEN – DALE – Etat de Genève

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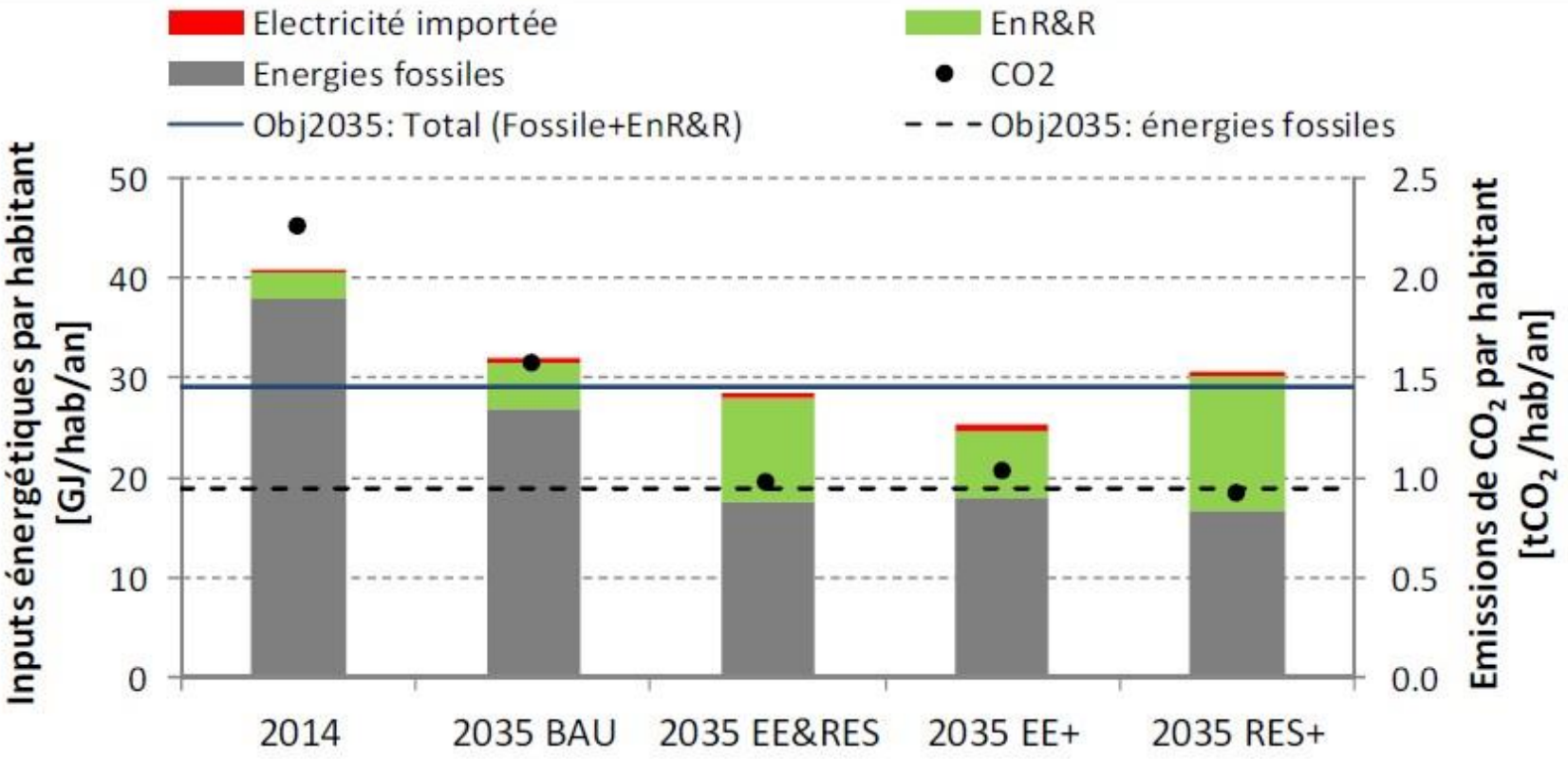
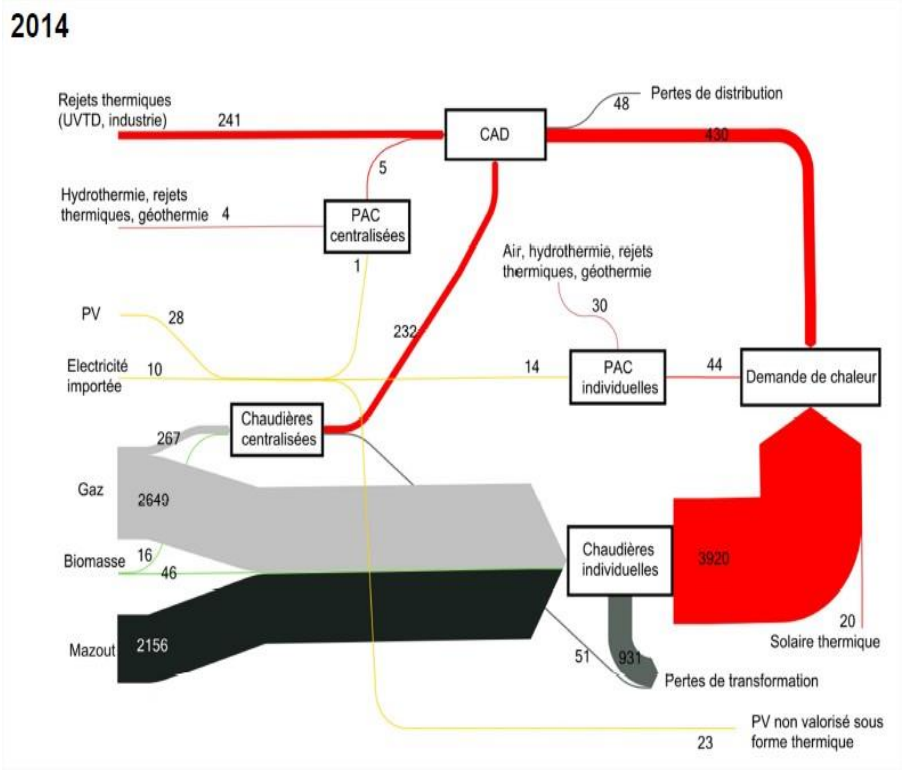
Energy efficiency mesures and development of renewables – different scenarios

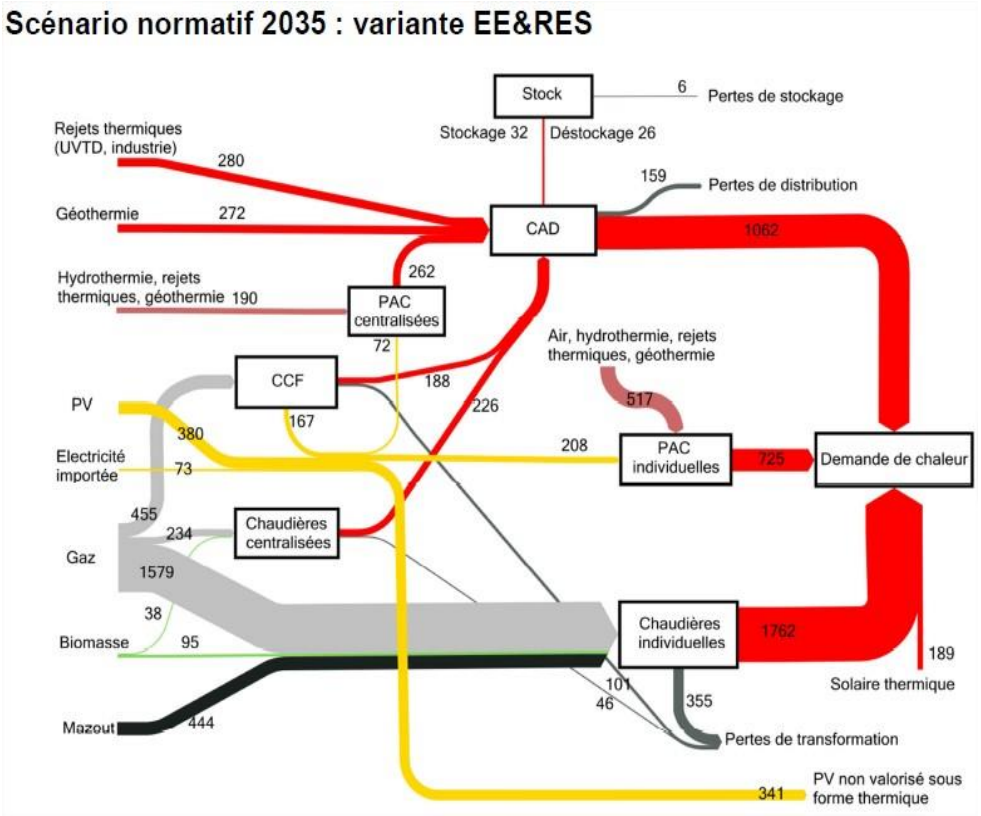


Inputs énergétiques et émissions de CO_2, par habitant, du système d'approvisionnement en chaleur à Genève. Comparaison entre scénarios et objectifs. (population: 482'545 en 2014 et 557'000 en 2035)

Source Quiquerez L. et al (2016)

Evolution of energy sources between 2014 and 2035 – district heating three times larger





Source Quiquerez L. et al (2016)

Many fonctions for geothermal energy

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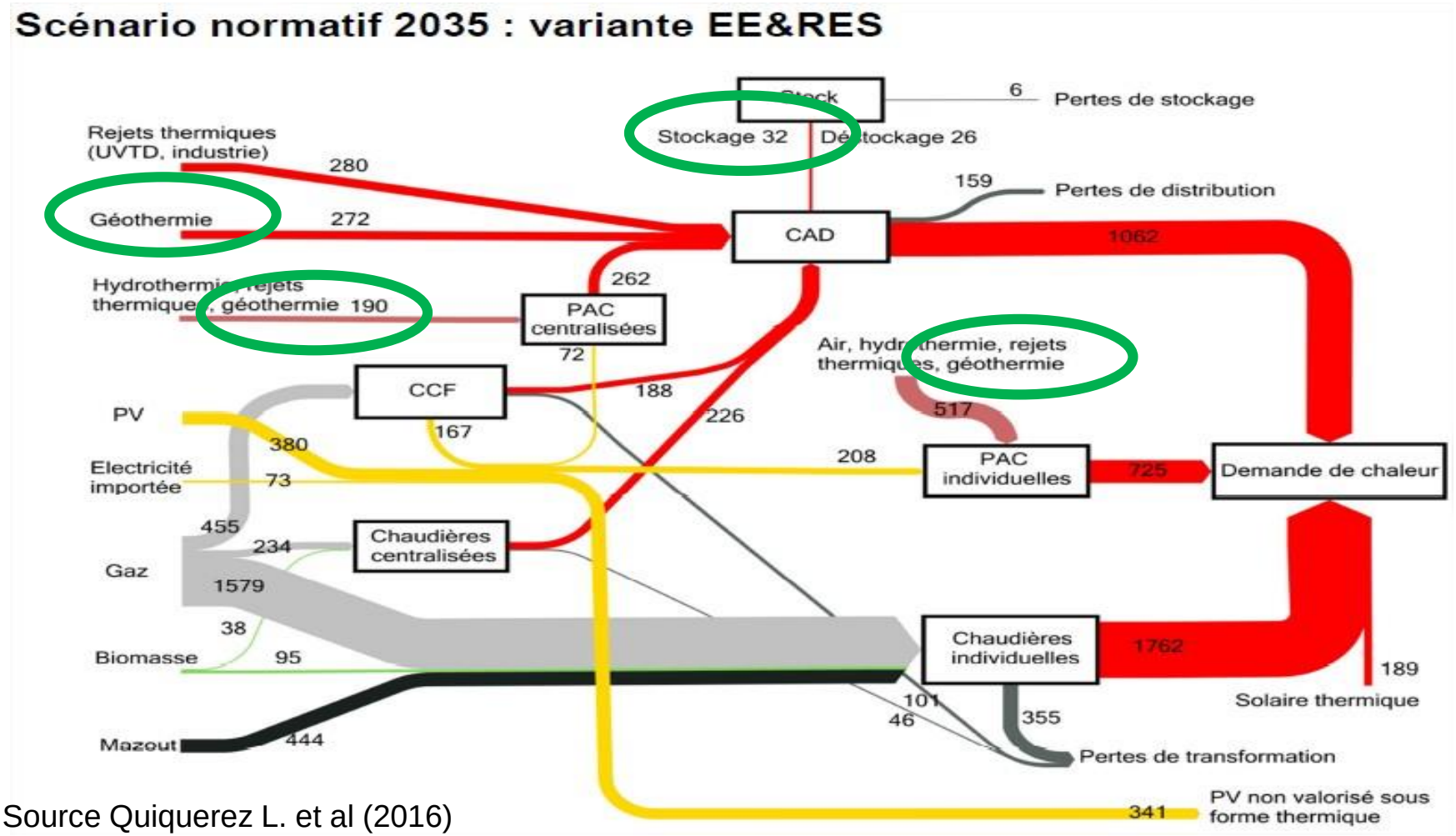

Source Quiquerez L. et al (2016)

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The transition is already running

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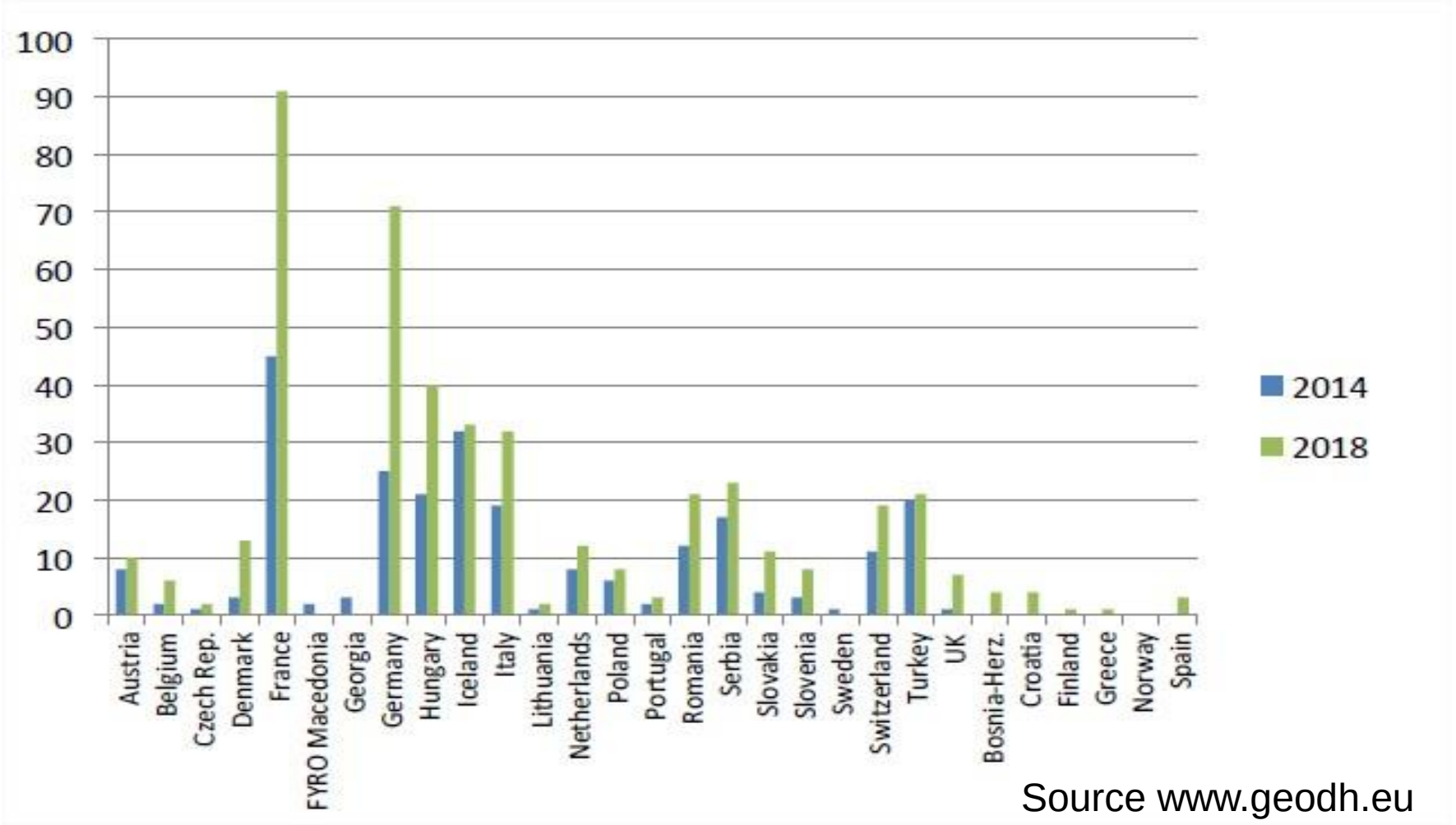

Source www.geodh.eu

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Future of hydrothermal applications and heat for the districts : use anything that is possible

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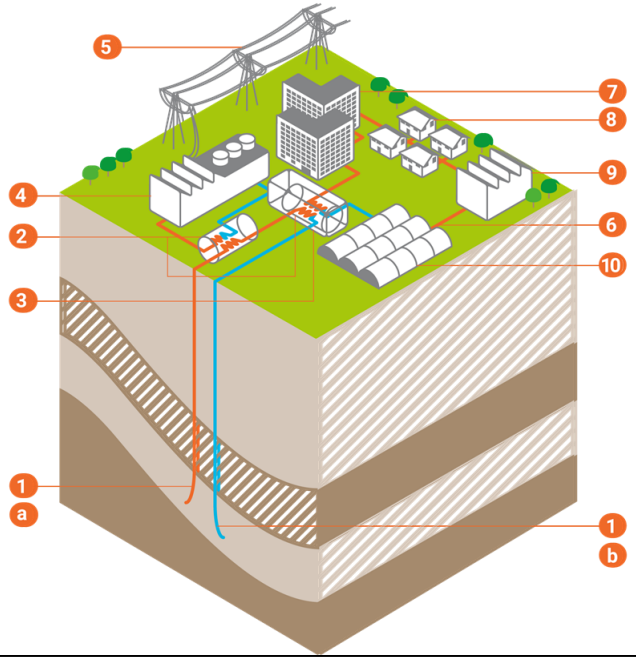
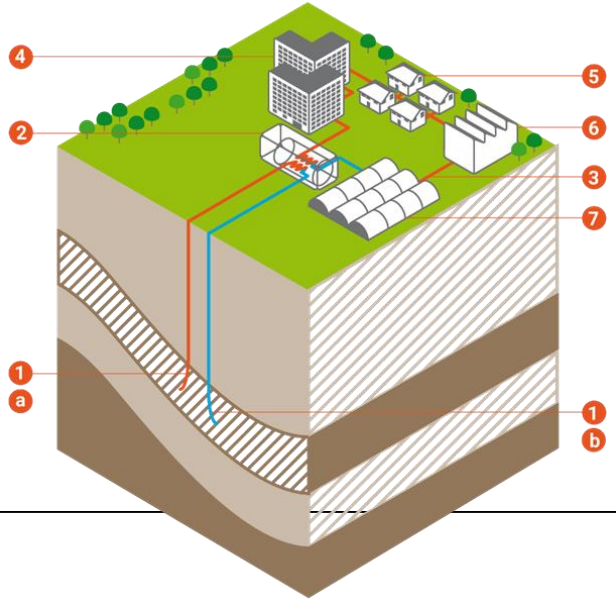
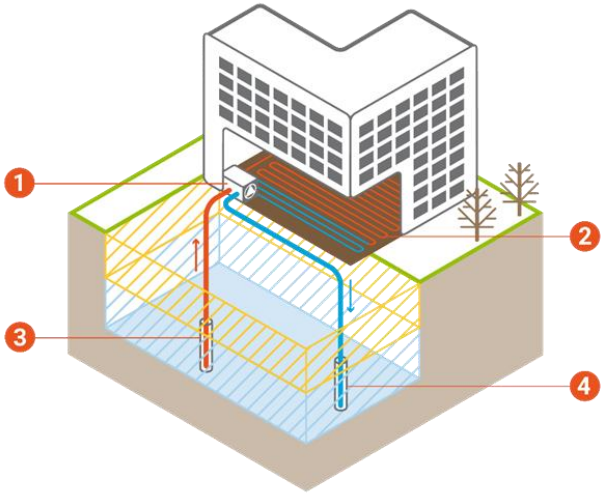
Type Münich



Type Paris



Type Geneva !



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Thank you for your attention

GEOTHERMIE 2020

Save the date !

22-23 November 2016

Yverdon – Swiss Geothermal days (Journée romande + Fachtagung)

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