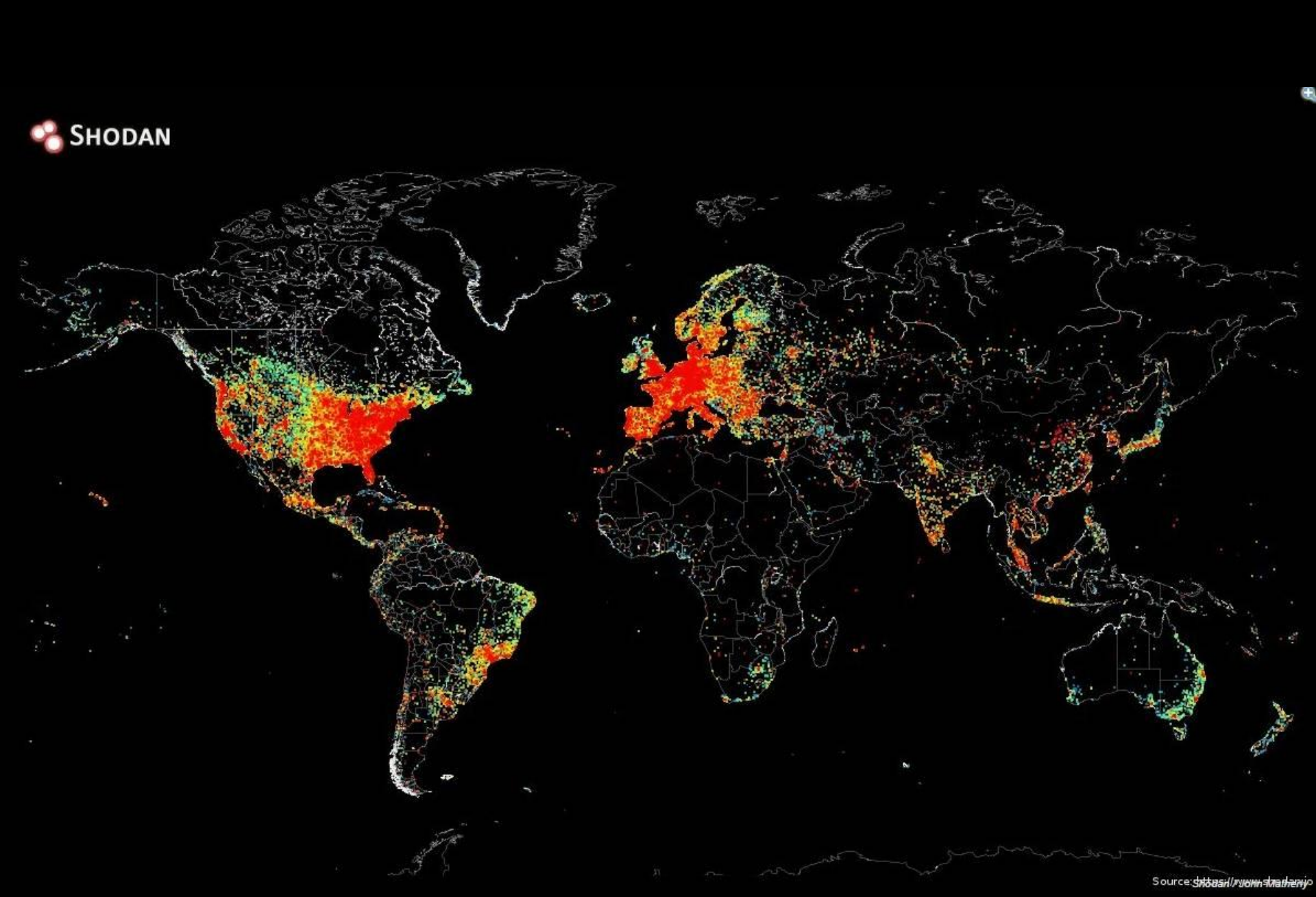
AMSTEIN + WALTHERT

Séminaire ecube

La valeur énergétique des datacenters

Corentin Maucoronel, A+W Genève
Auberge de Puidoux, le 7.04.2017


SHODAN
Source: https://www.shodan.io
Shodan /u/jon-matheny

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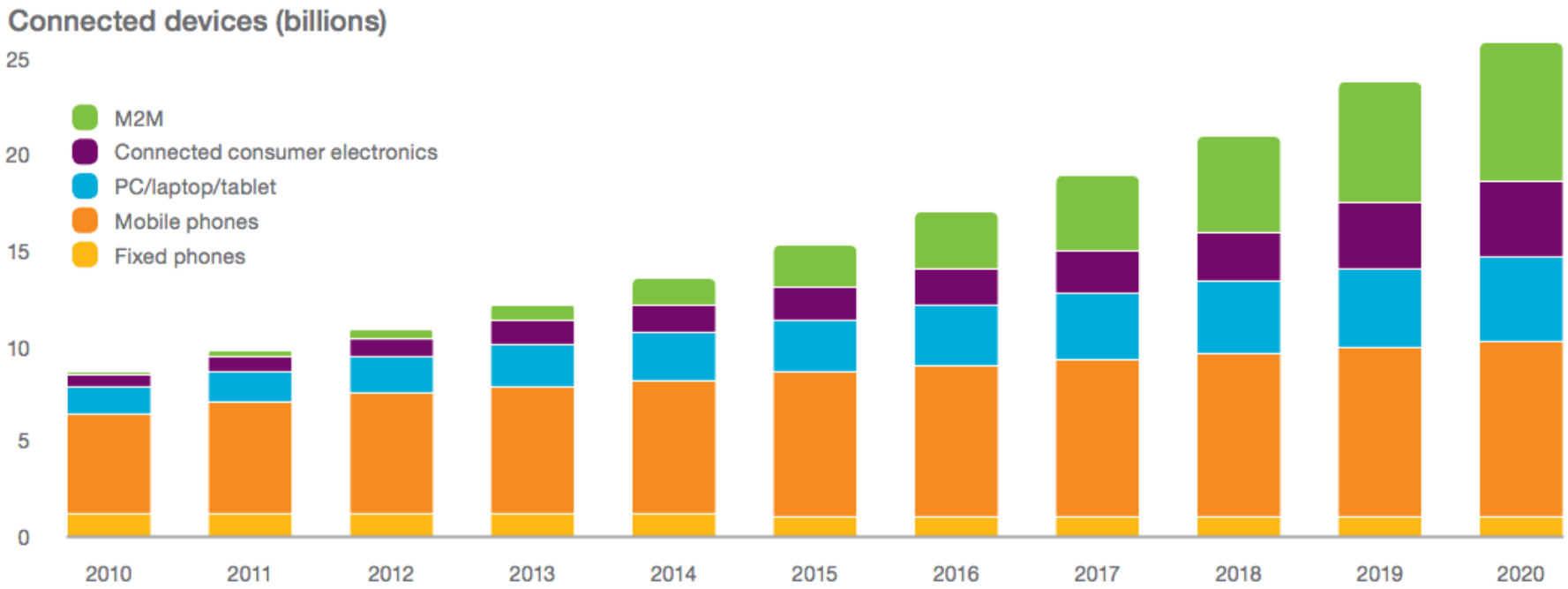
Les datacenters à l'épreuve de l' IdO



Examples of M2M: connected cars, machines and utility meters
Examples of consumer electronic (CE) devices networked TVs, digital media boxes, Blu-ray players, etc
Not included: passive sensors and RFID tags

Ericsson

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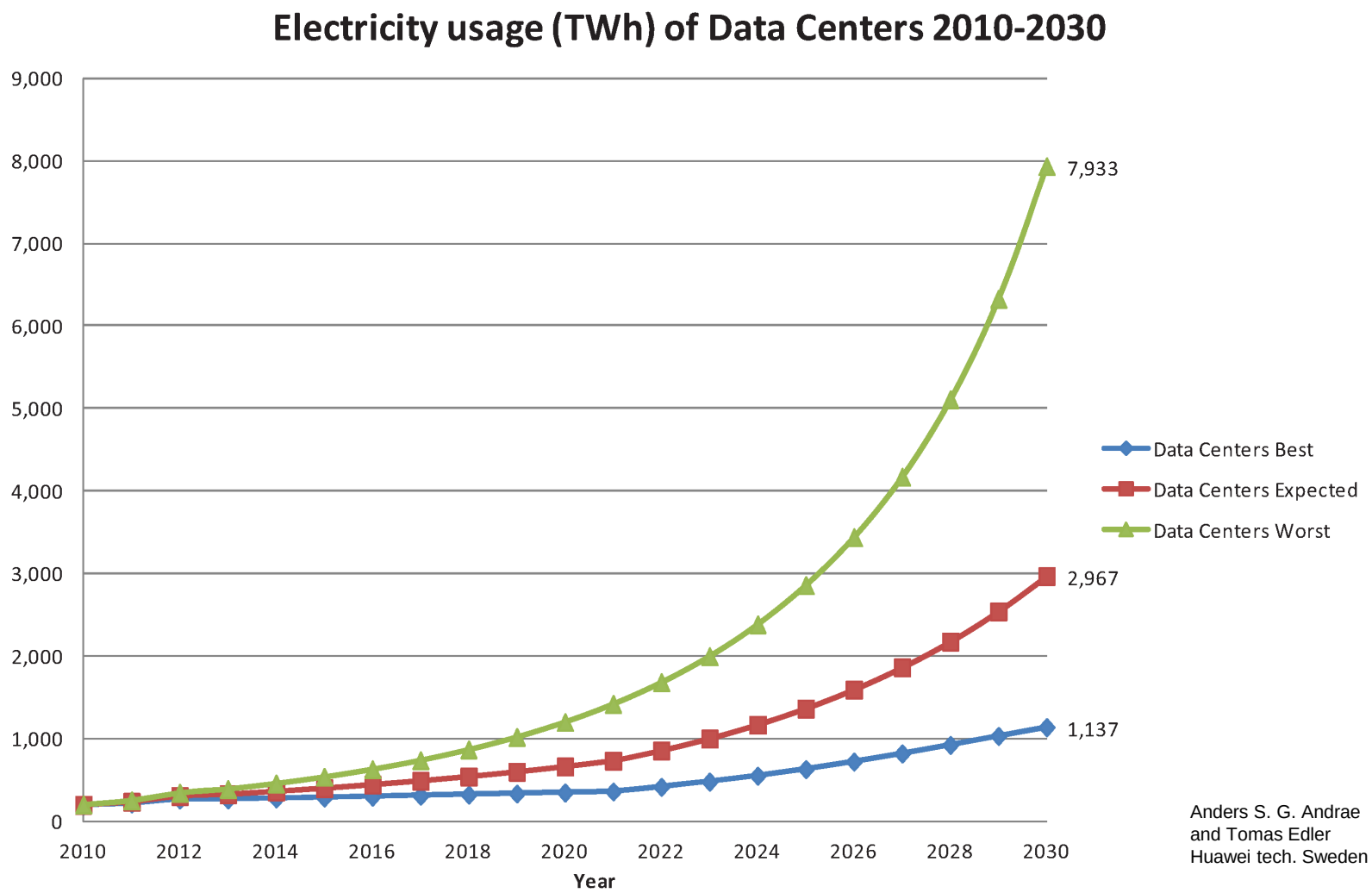
Impact énergétique



Anders S. G. Andrae
and Tomas Edler
Huawei tech. Sweden

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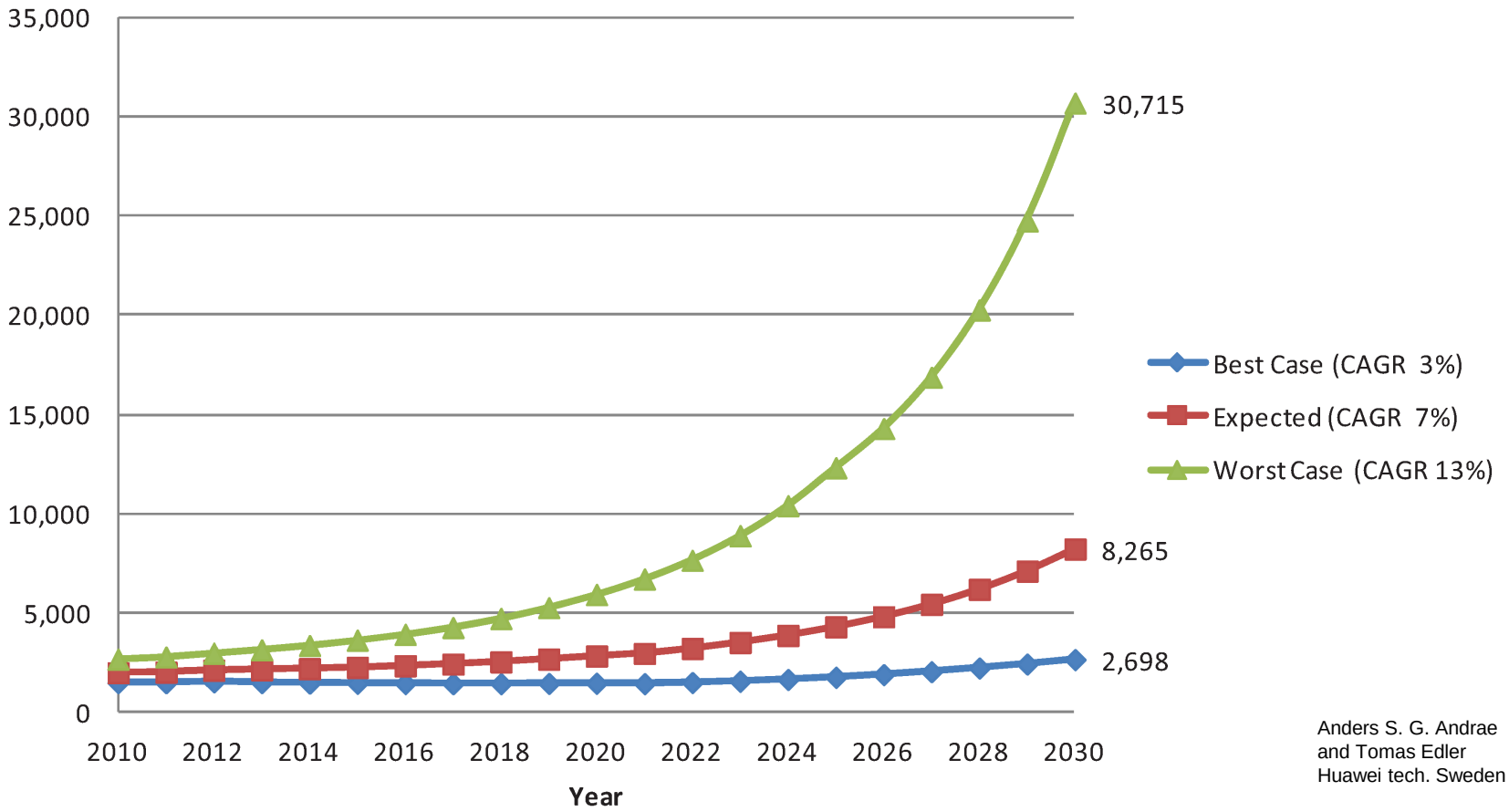
Impact énergétique

Electricity footprint (TWh) of Communication Technology 2010–2030



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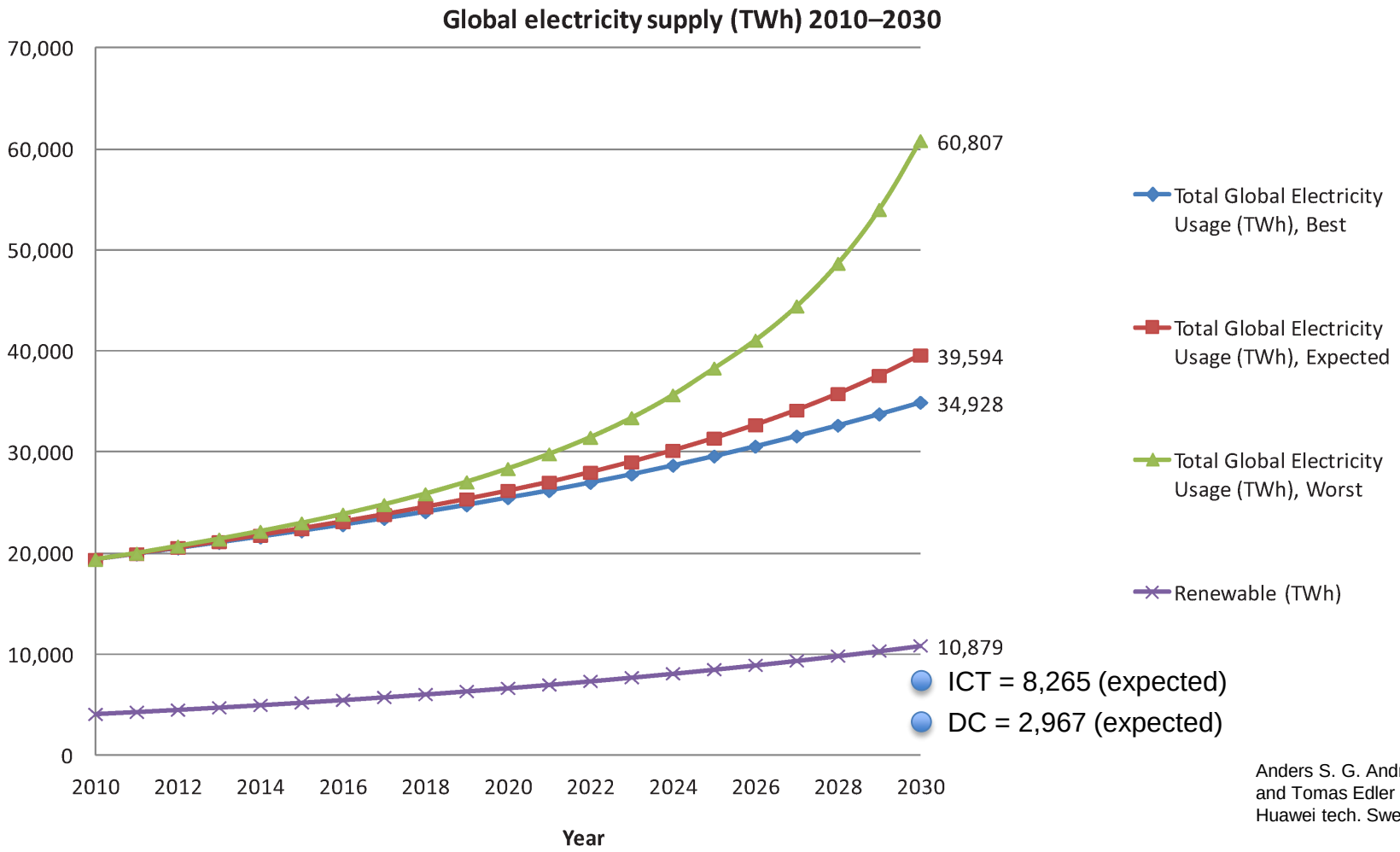
Impact énergétique



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Huawei tech. Sweden

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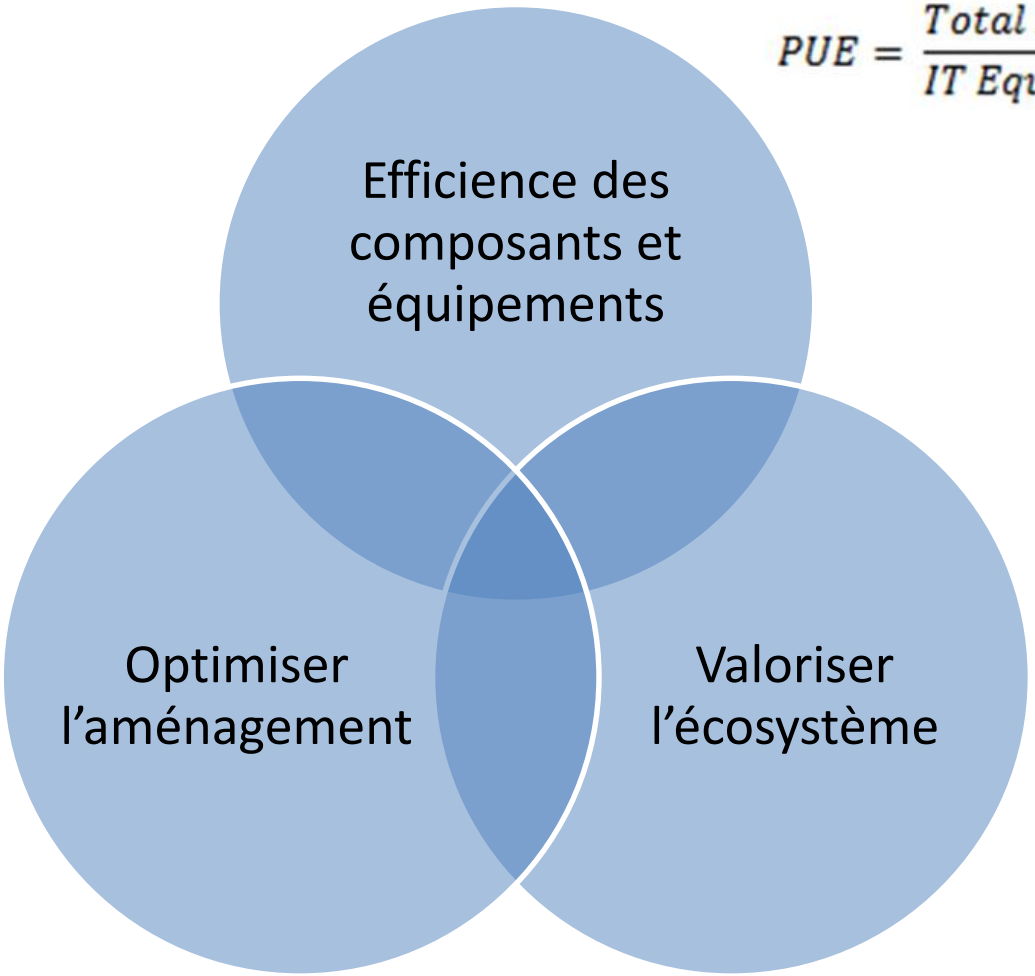
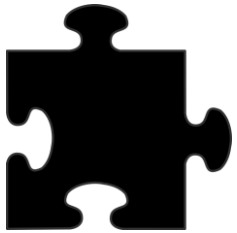
Datacenter et efficience énergétique

$$PUE = \frac{Total\ Facility\ Power}{IT\ Equipment\ Power}$$





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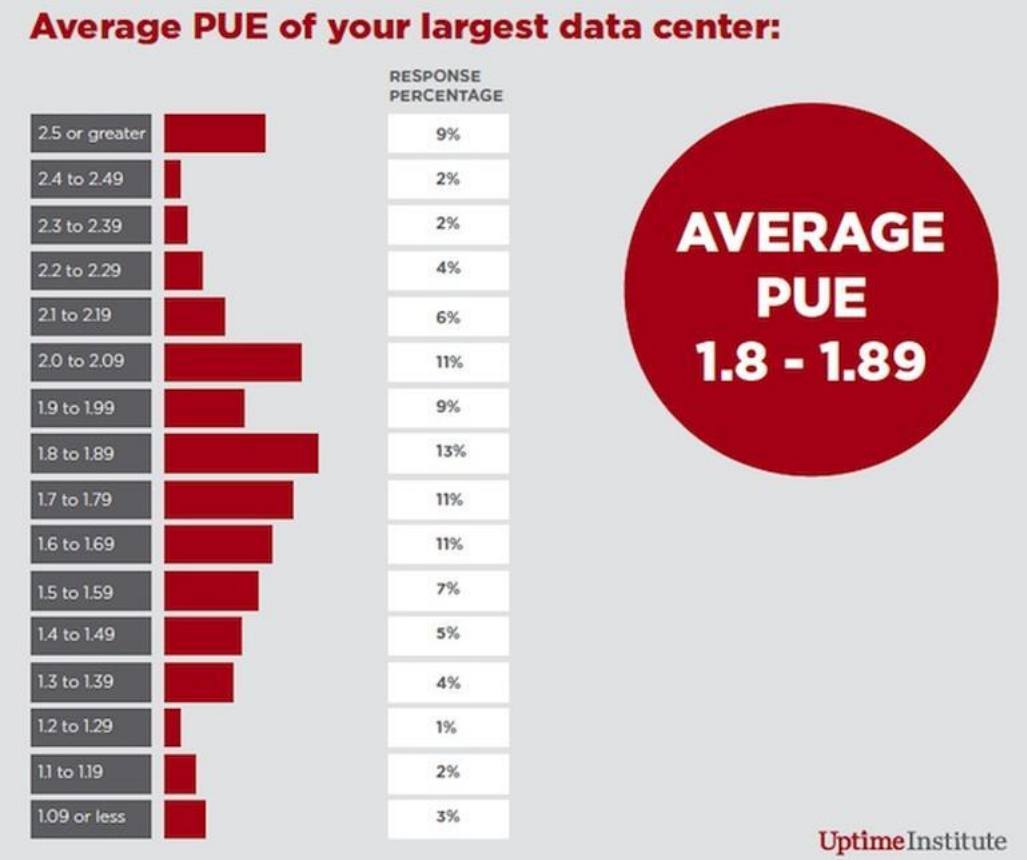
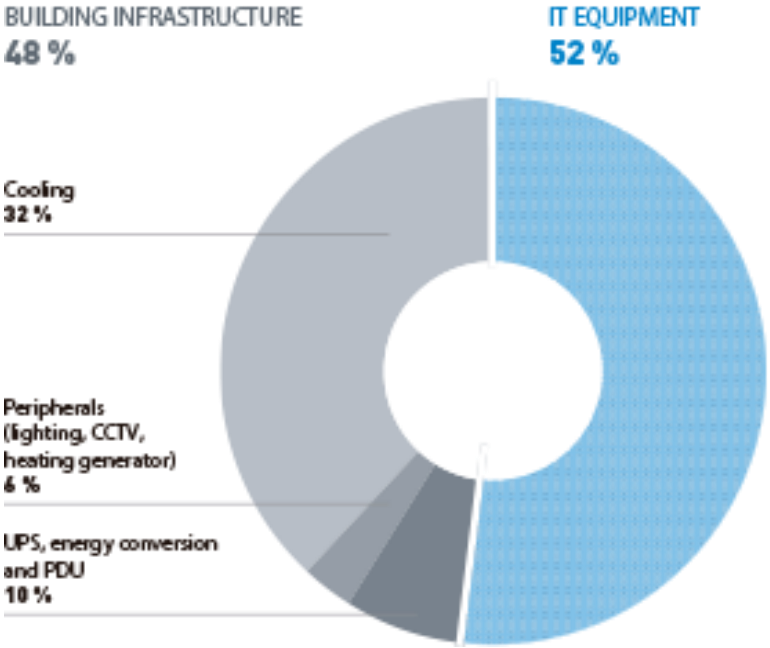
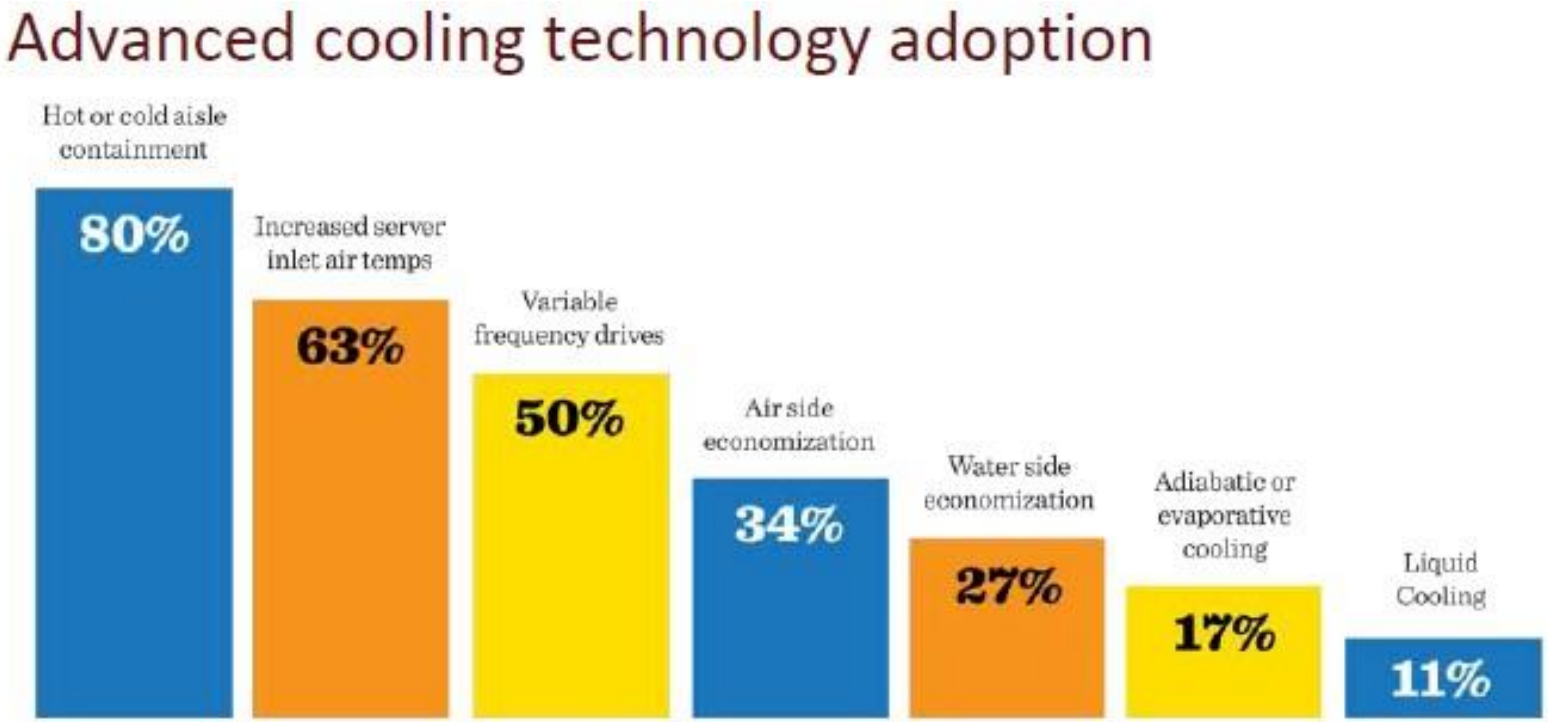
Optimiser composants et équipements



$$PUE = \frac{Total\ Facility\ Power}{IT\ Equipment\ Power}$$



Optimiser composants et équipements



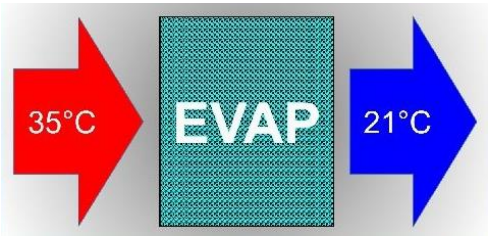
Source : Uptime Institute

Optimiser composants et équipements

Source : A+W

Datacentre Avenches

Source : 24 Heures



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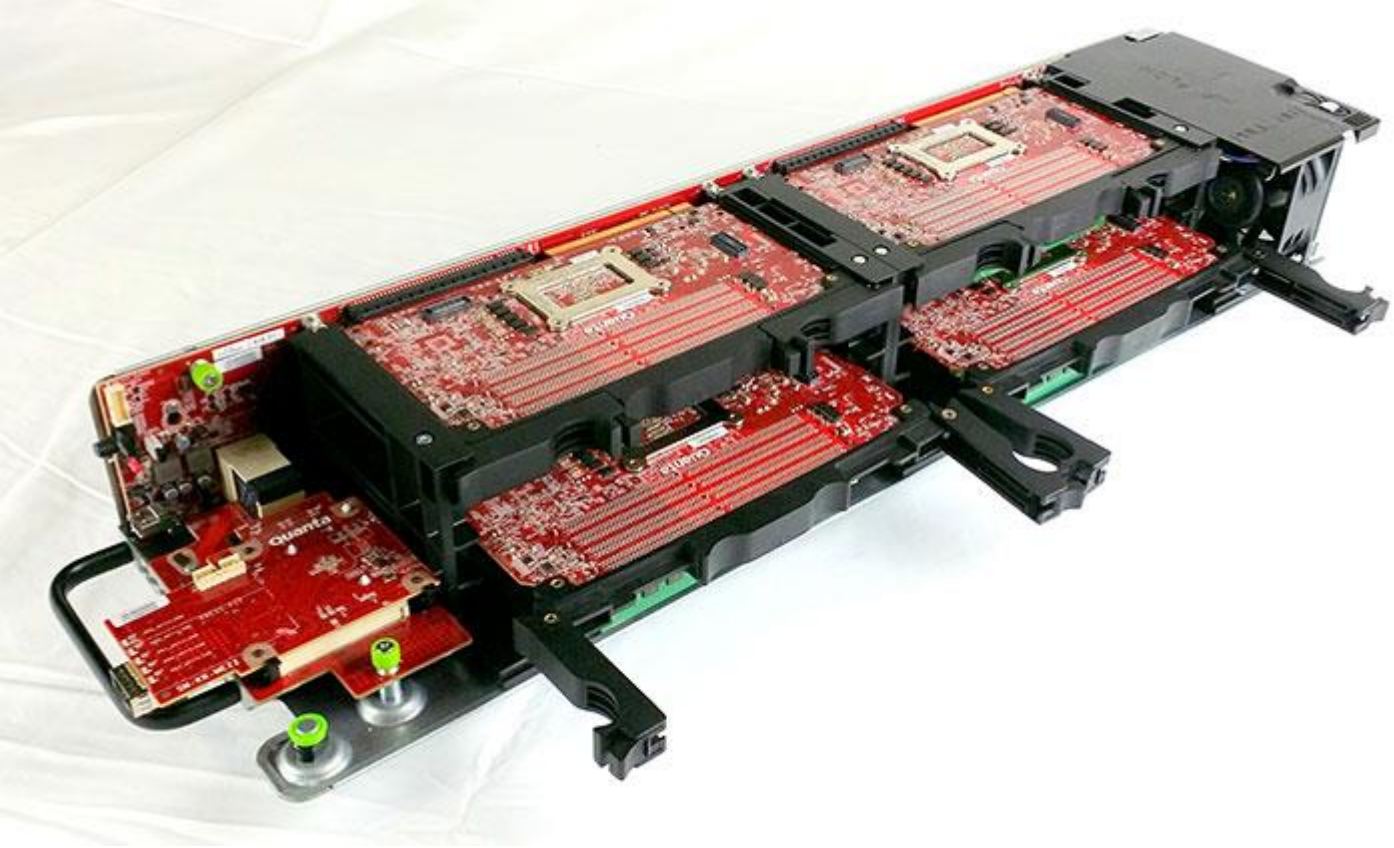
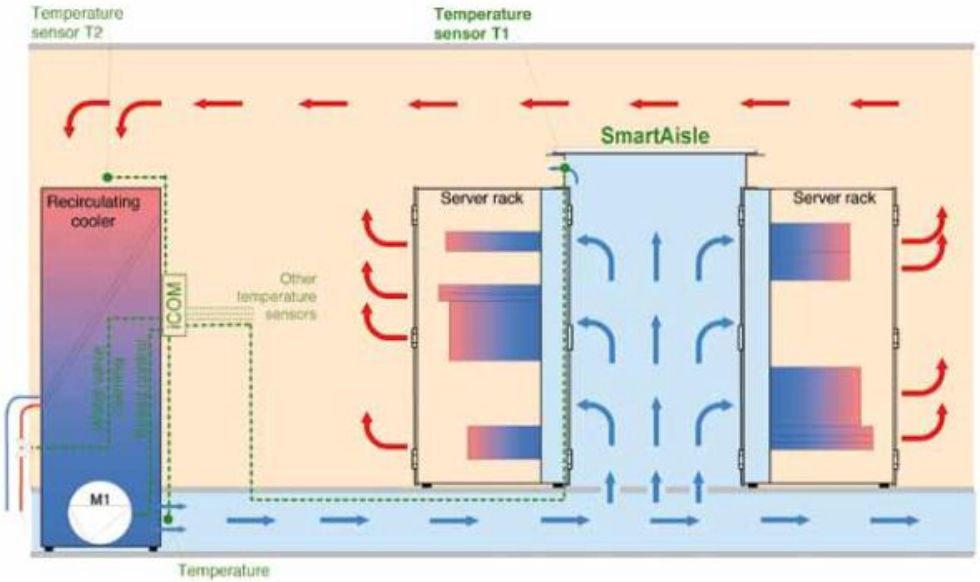
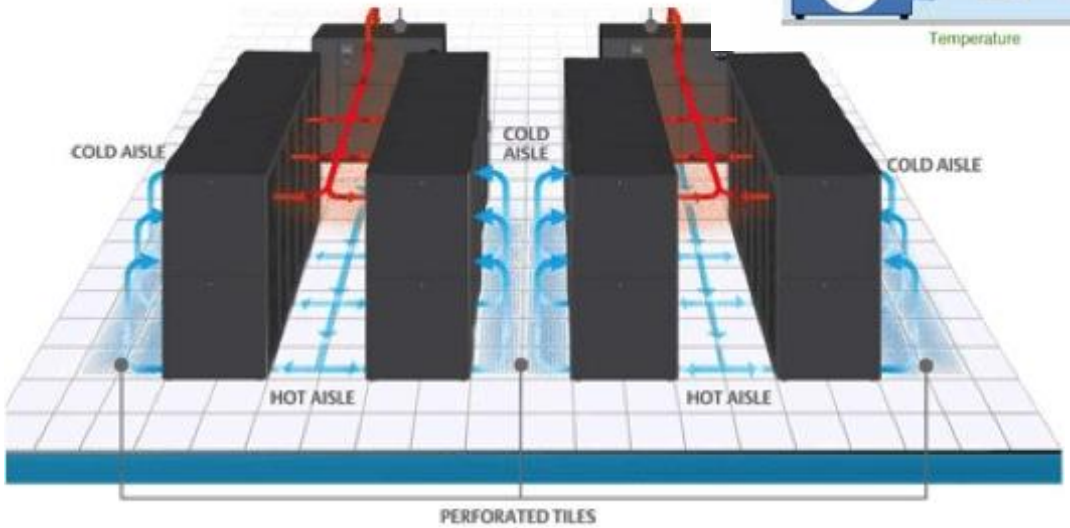
Optimiser l'aménagement



Source : Yosemite

Optimiser l'aménagement





Source : Emerson

Valorisation de l’écosystème

Ferme solaire d'Apple vue du ciel Caroline du Nord / USA

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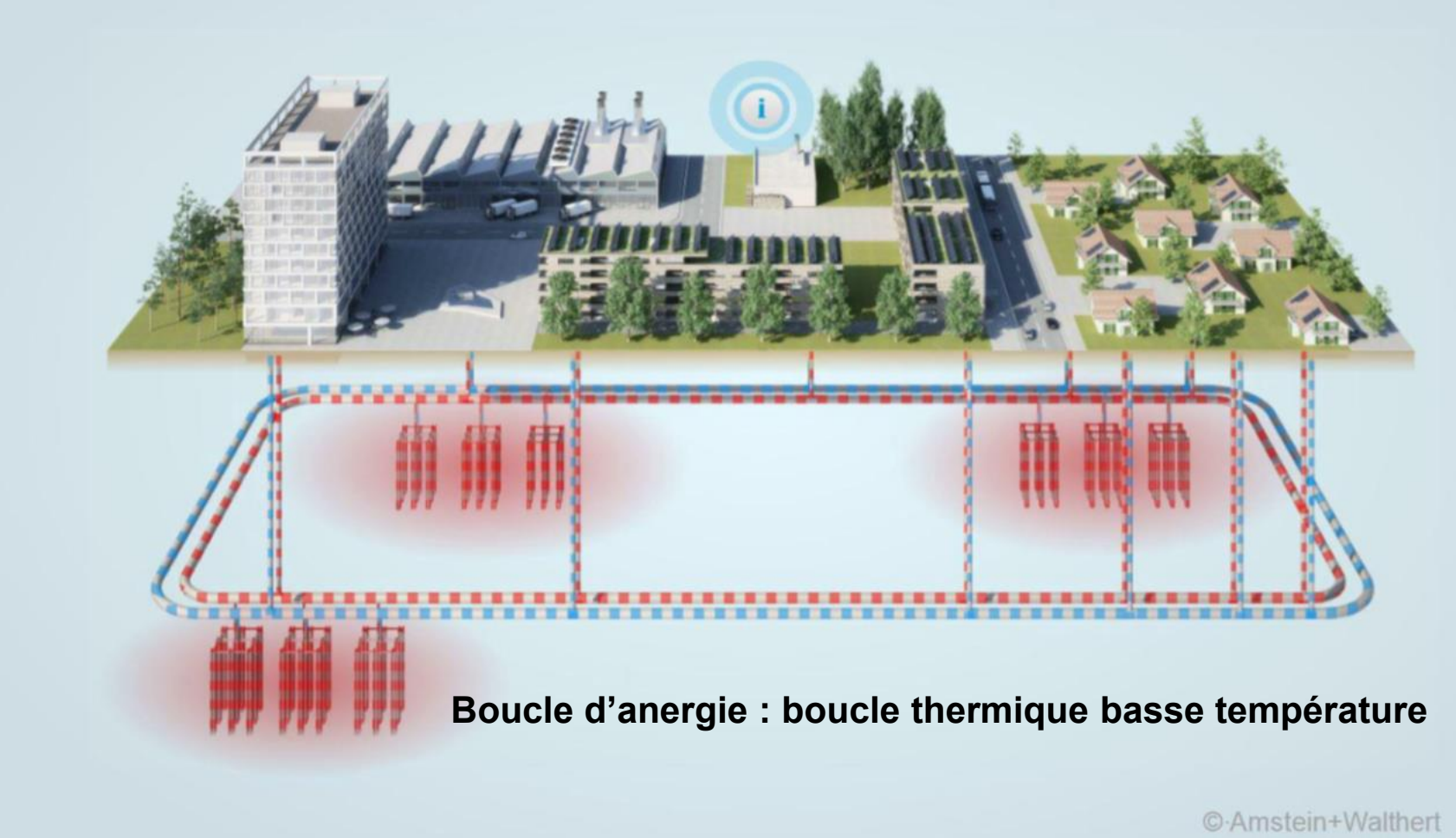
Valorisation de la chaleur fatale

Valoriser la chaleur fatale des datacenters
Pour le chauffage des bâtiments

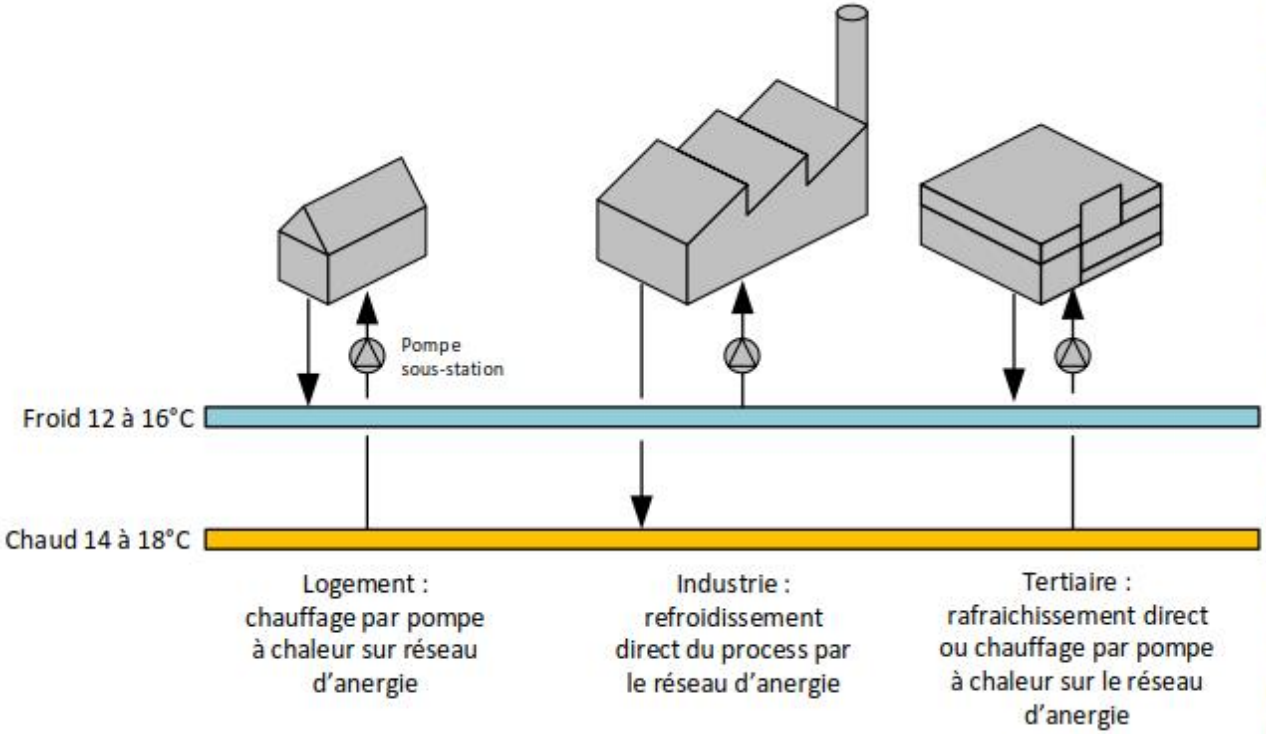
EPFZ Hönggerberg

AMSTEIN + WALTHERT

Valorisation de la chaleur fatale

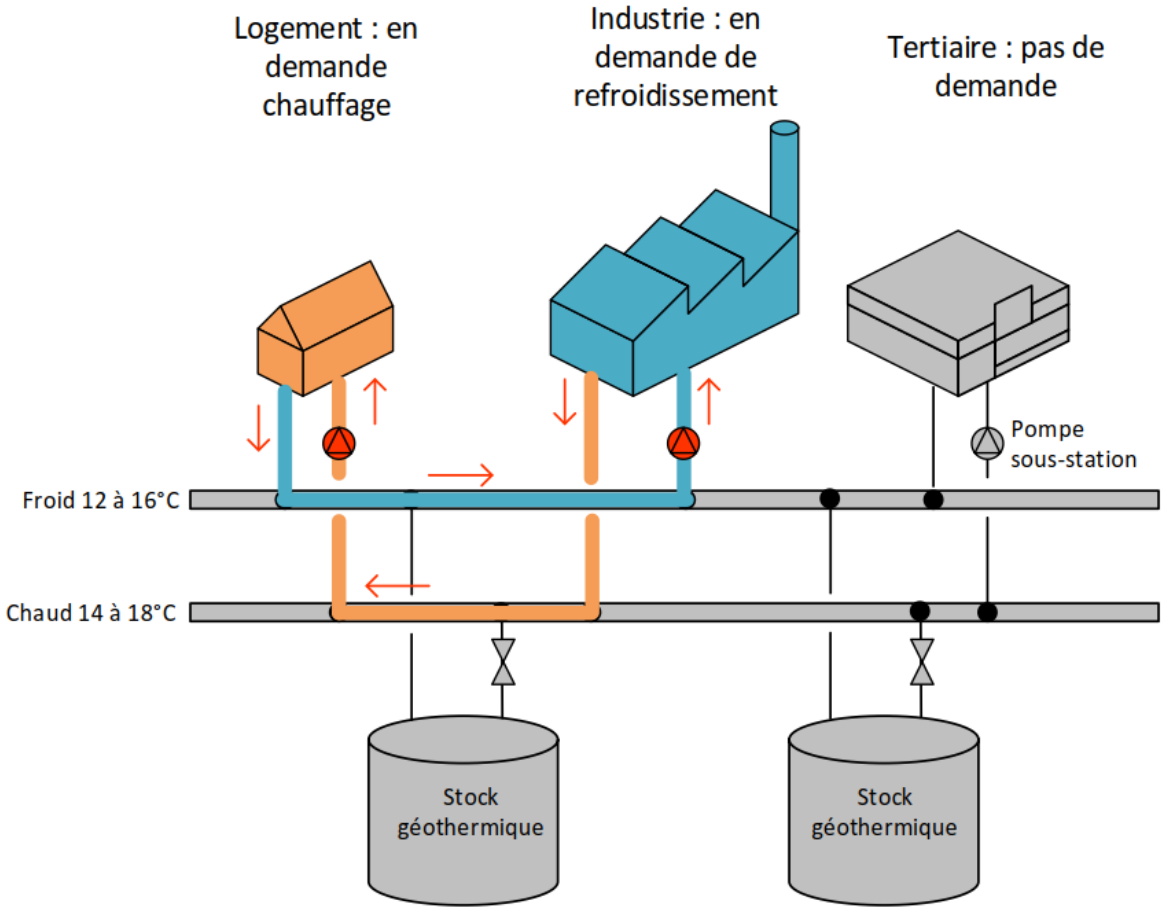


Valorisation de la chaleur fatale



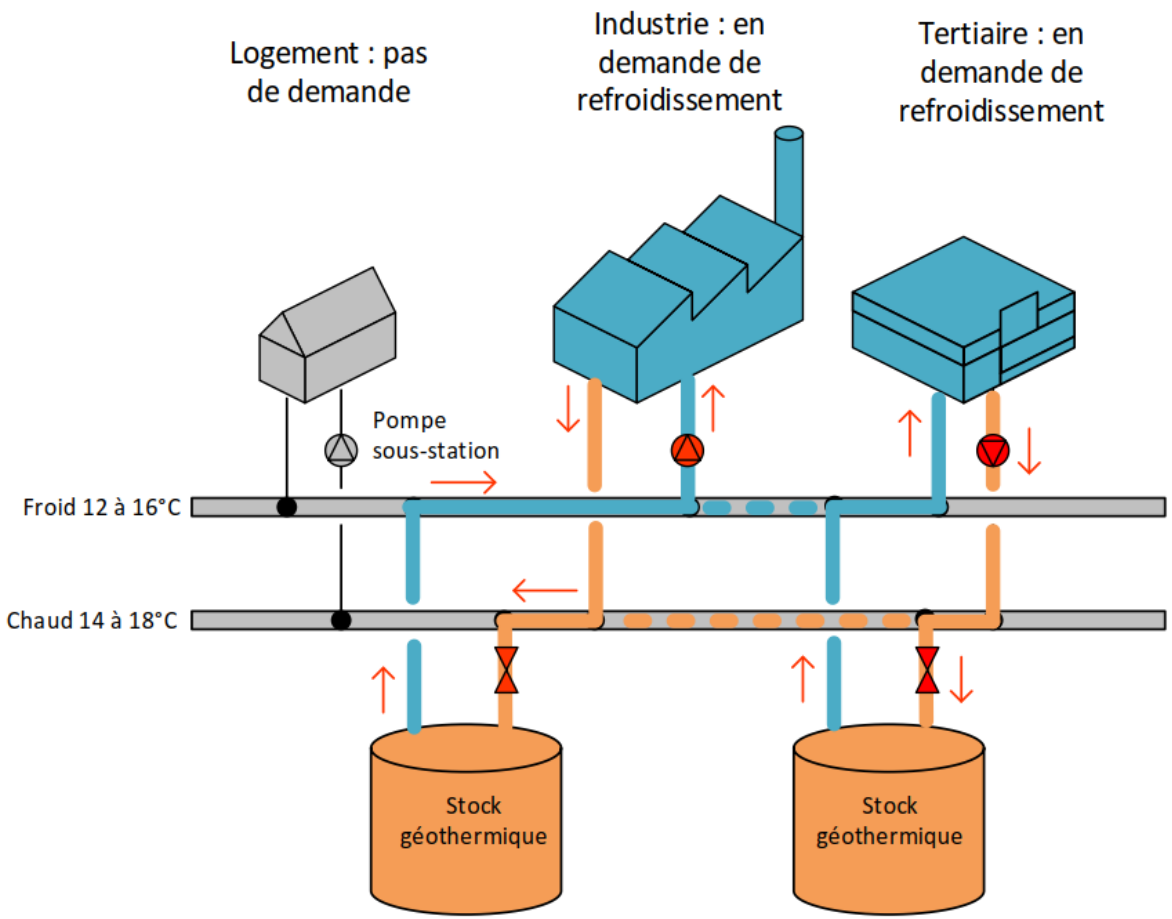
Pose du réseau d'anergie de Zurich FGZ (Suisse)

Valorisation de la chaleur fatale



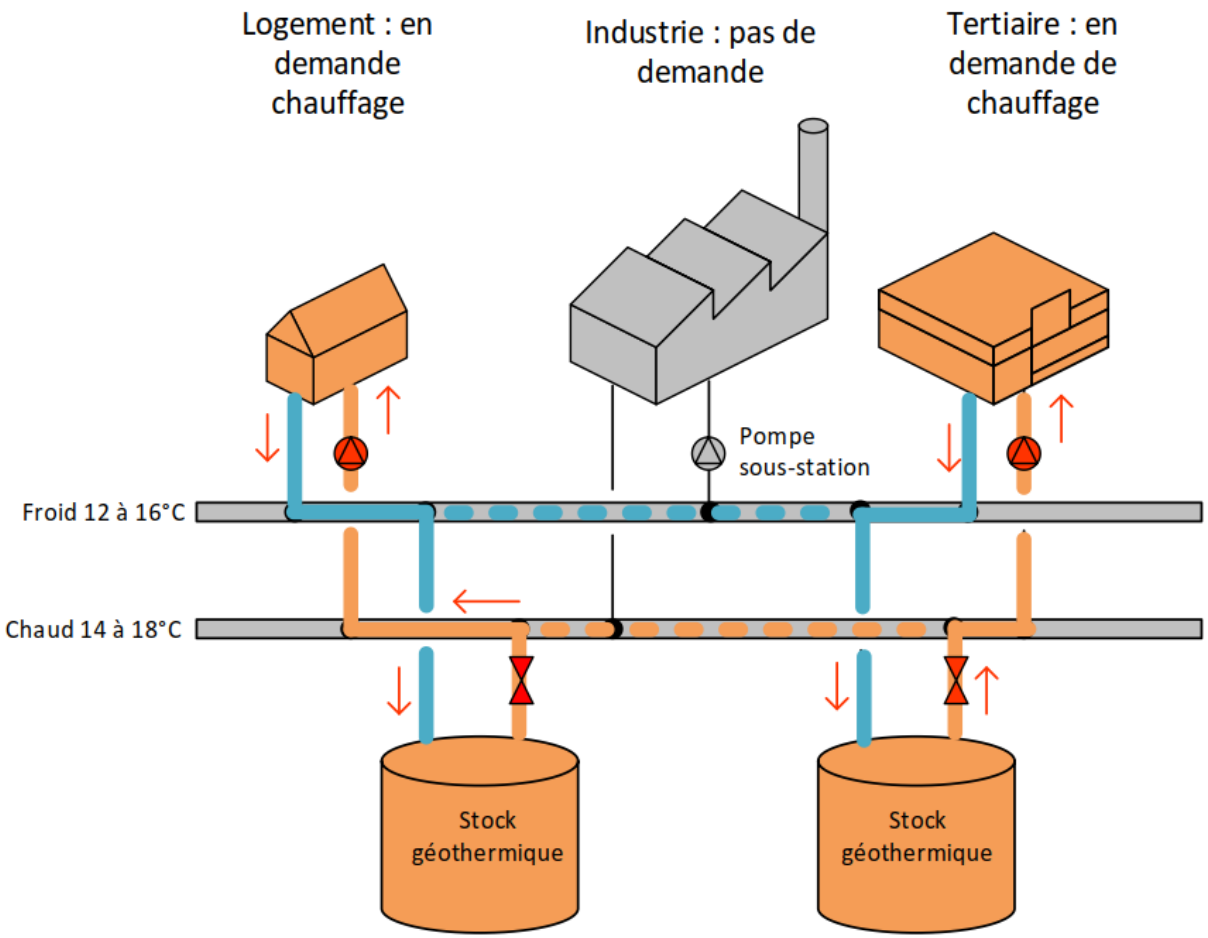
Réseau d'anergie :
Équilibre entre les besoins de chaud et de froid

Valorisation de la chaleur fatale



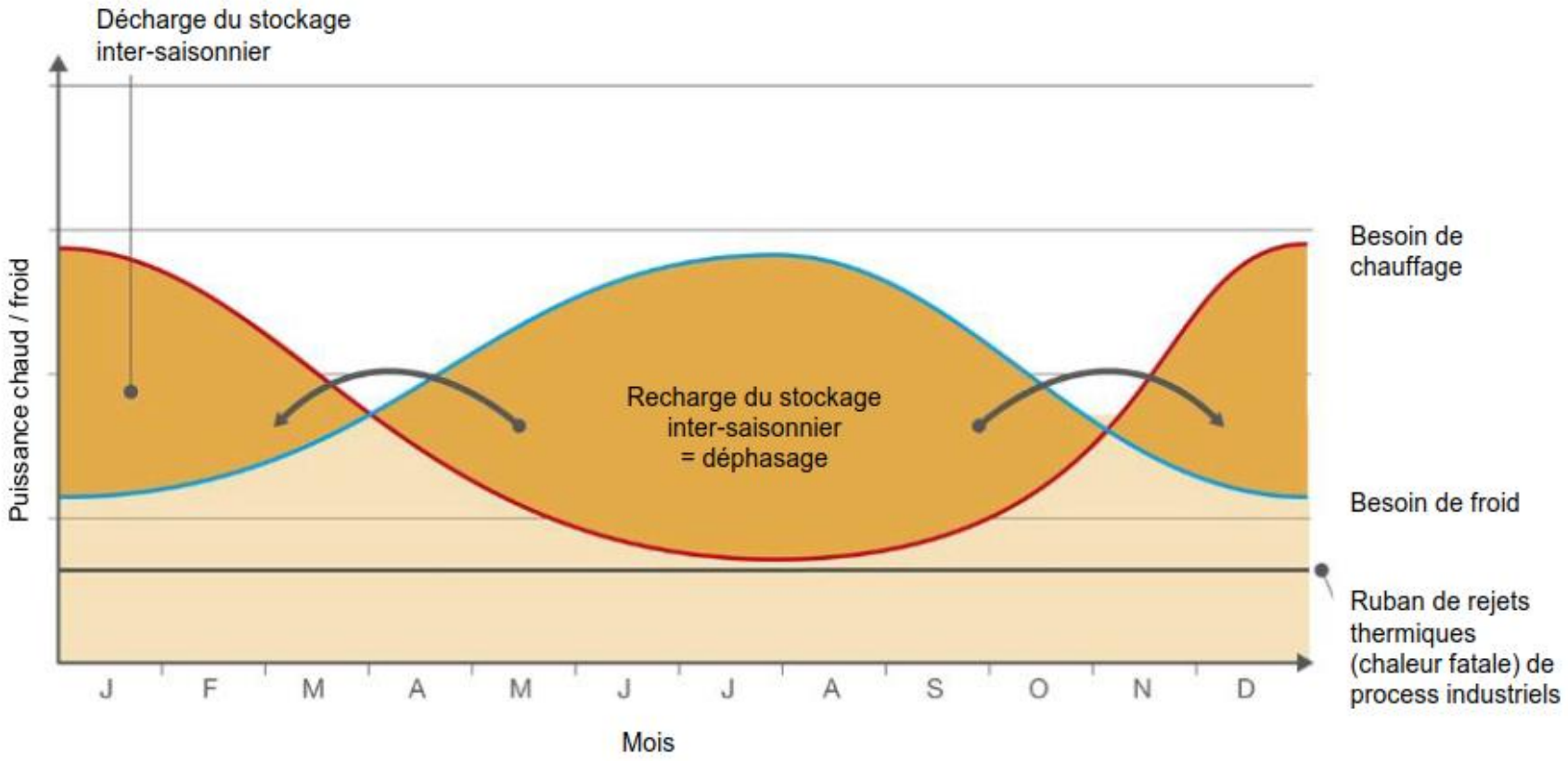
Réseau d'anergie :
Fonctionnement estival

Valorisation de la chaleur fatale



Réseau d'anergie :
Fonctionnement hivernal

Valorisation de la chaleur fatale



Principe de fonctionnement du stockage inter-saisonnier

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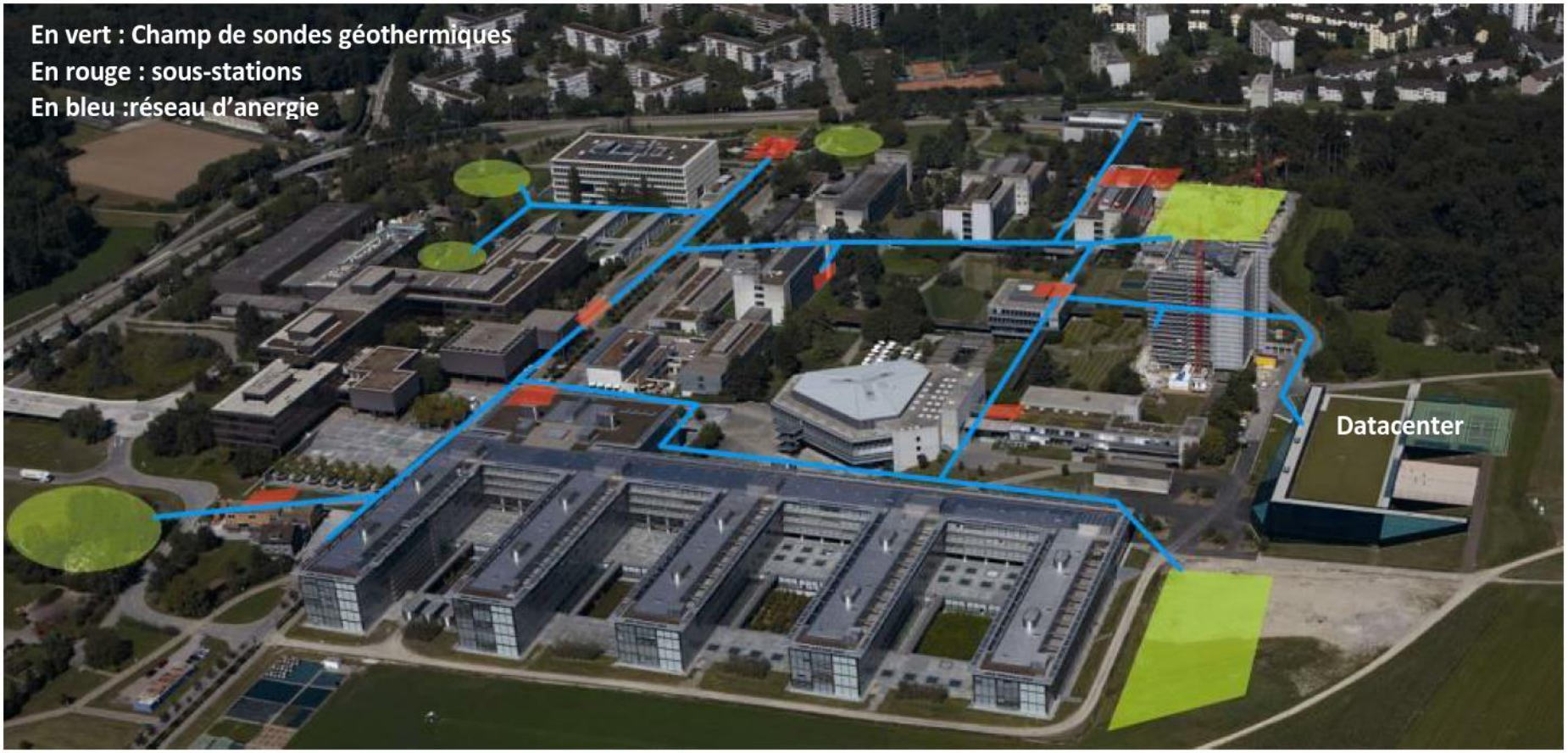
Valorisation de la chaleur fatale



EPFZ Hönggerberg

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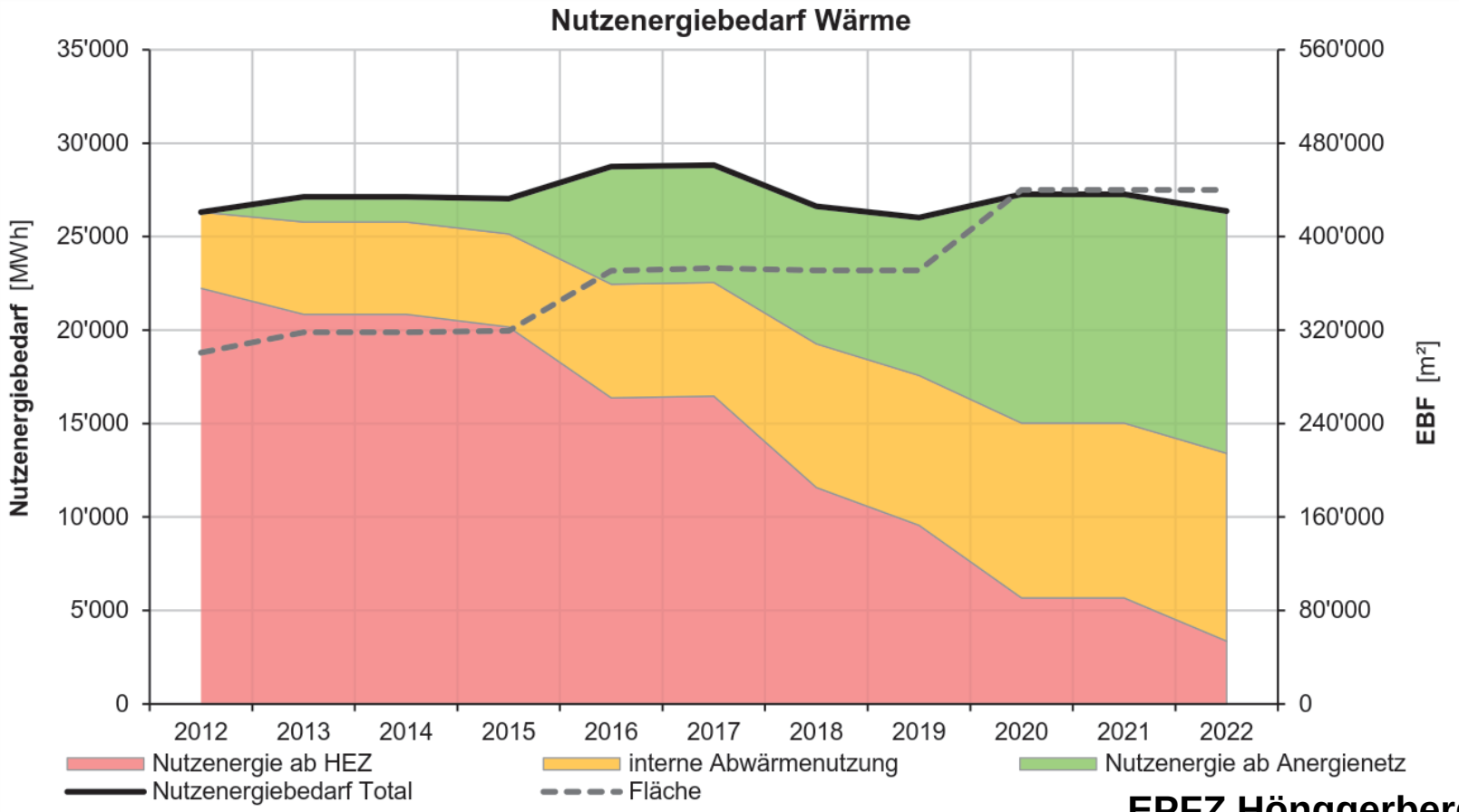
Valorisation de la chaleur fatale



EPFZ Hönggerberg

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Valorisation de la chaleur fatale

Kennzahlen:

	COP* Leistungszahl	JAZ* Jahresarbeitszahl
Nutzwärme		
HPZ (36°C / 26°C)	7.5	5.5
HPL (33°C / 28°C)	9.0	7.0
Klimakälte		
HPZ (18°C / 22°C)	17.5	-
HPL (17°C / 21°C)	30.0	26.5
Laborkälte		
HPZ (16°C / 20°C)	17.5	12.0
HPL (11°C / 15°C)	30.0	15.0

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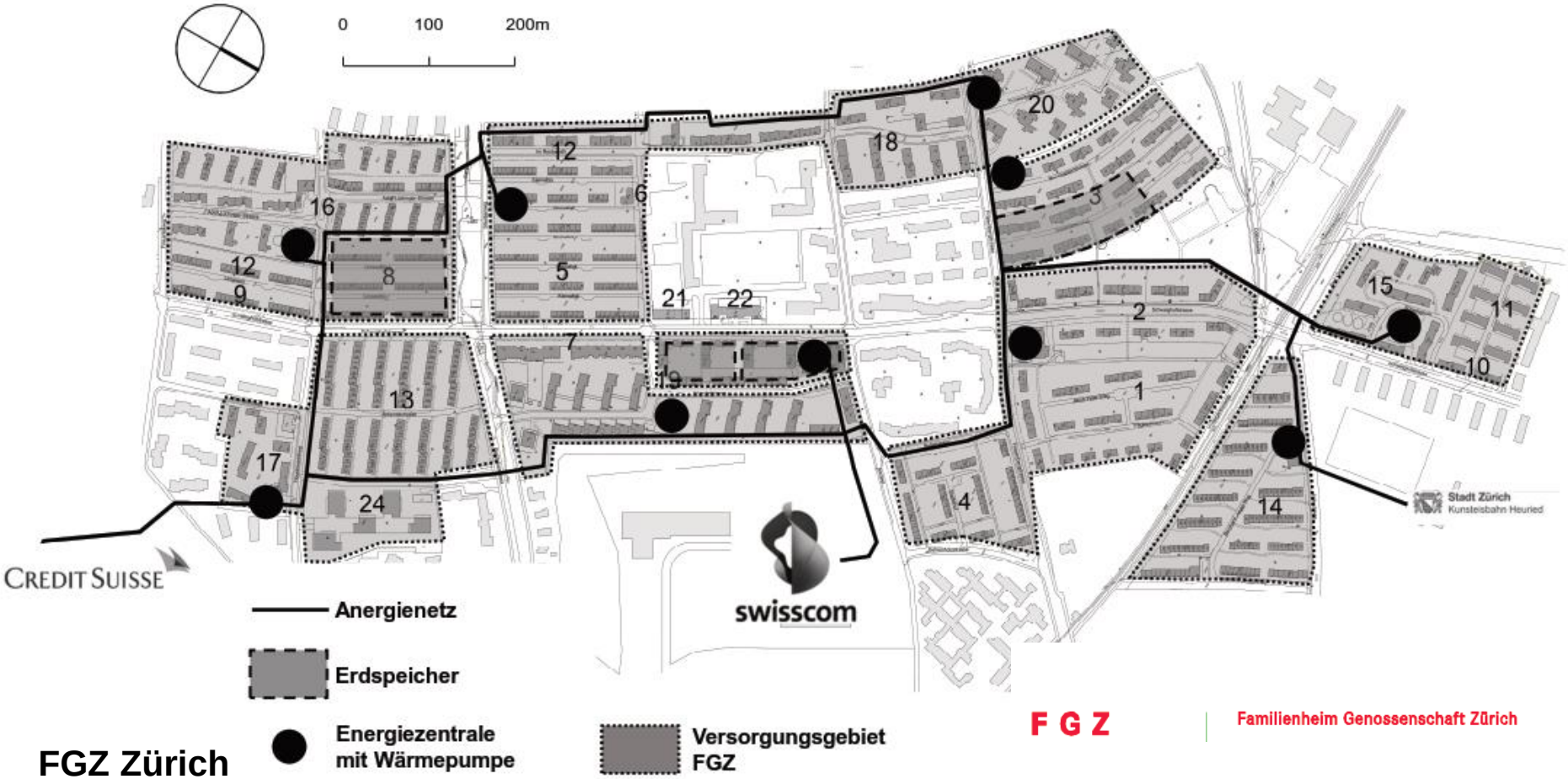
Valorisation de la chaleur fatale

FGZ | Familienheim Genossenschaft Zürich

FGZ Zürich

AMSTEIN + WALTHERT

Valorisation de la chaleur fatale



FGZ Zürich

F G Z | Familienheim Genossenschaft Zürich

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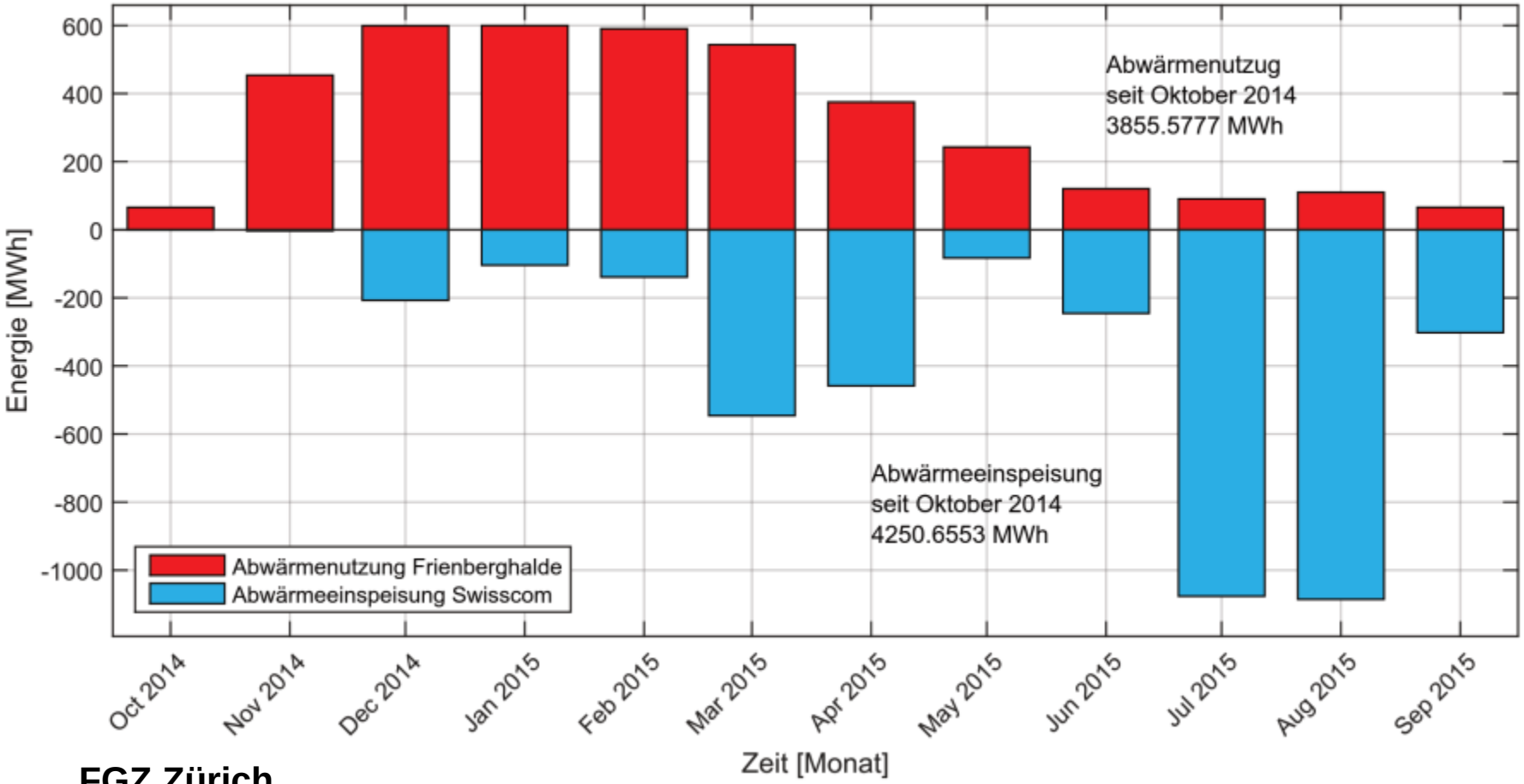
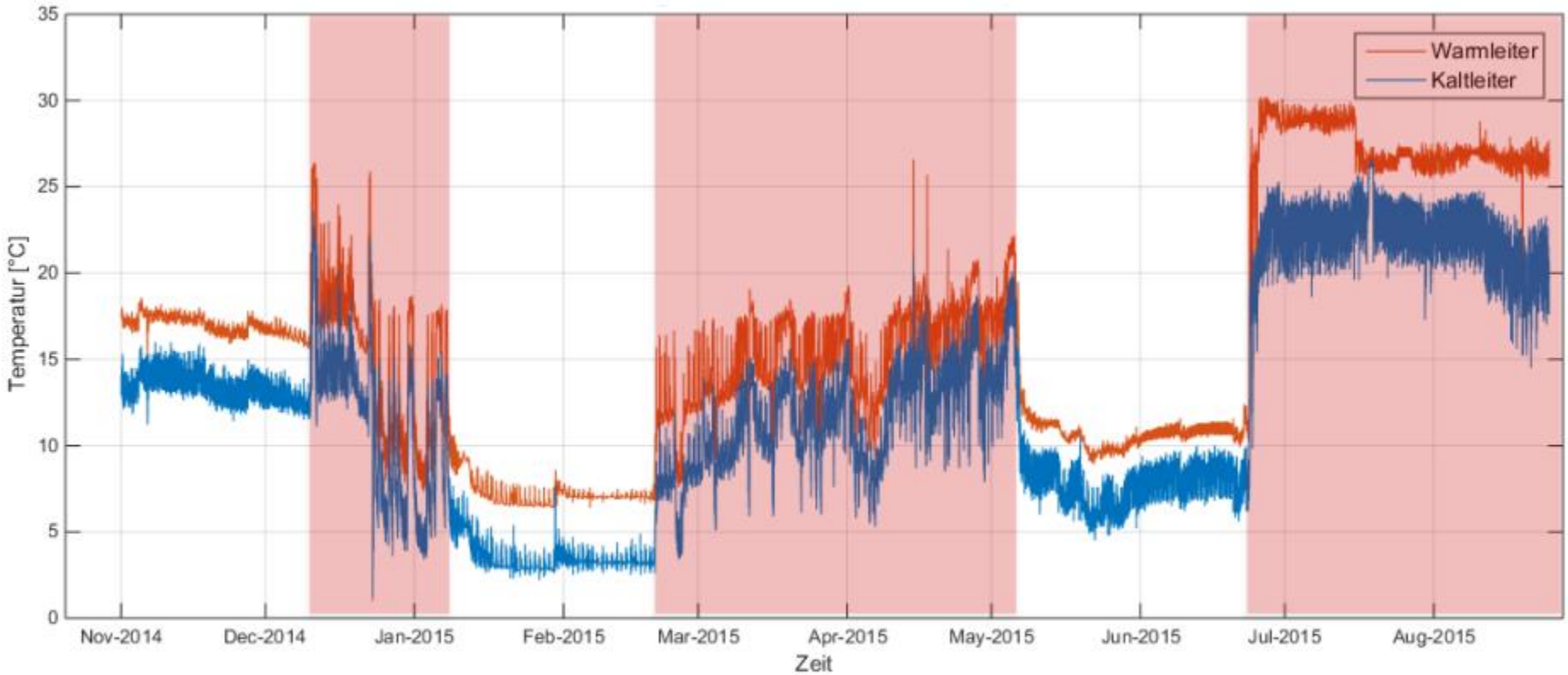
Valorisation de la chaleur fatale



FGZ Zürich

AMSTEIN + WALTHERT

Valorisation de la chaleur fatale



Abwärmennutzung ab Kältenetz (Direktkühlung)

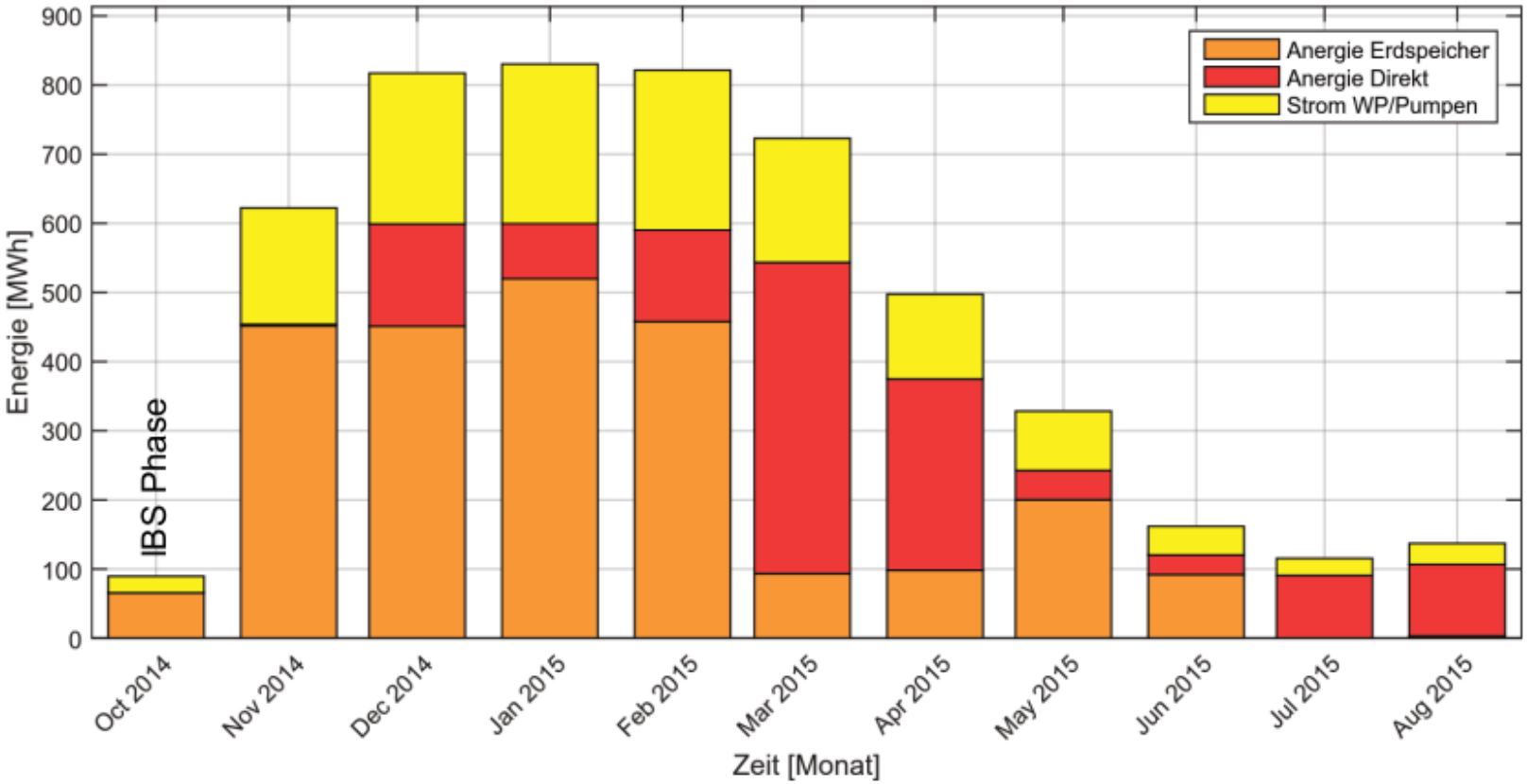
Abwärmennutzung ab Kältenetz (Direktkühlung)

Abwärmennutzung ab Rückkühlnetz

FGZ Zürich

AMSTEIN + WALTHERT

Valorisation de la chaleur fatale



FGZ Zürich

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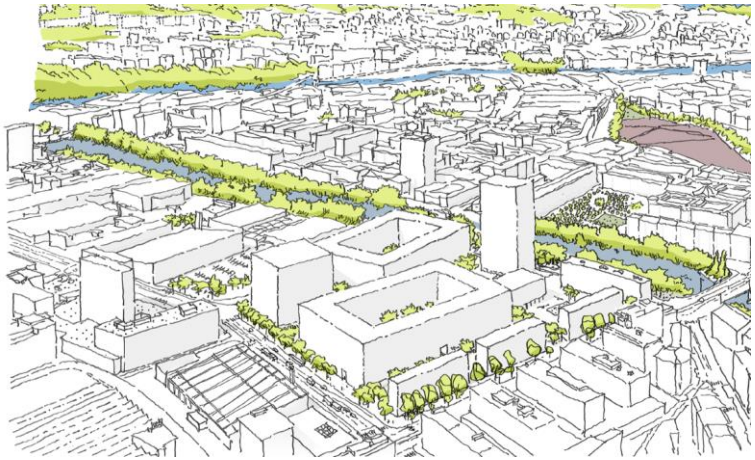
Valorisation de la chaleur fatale

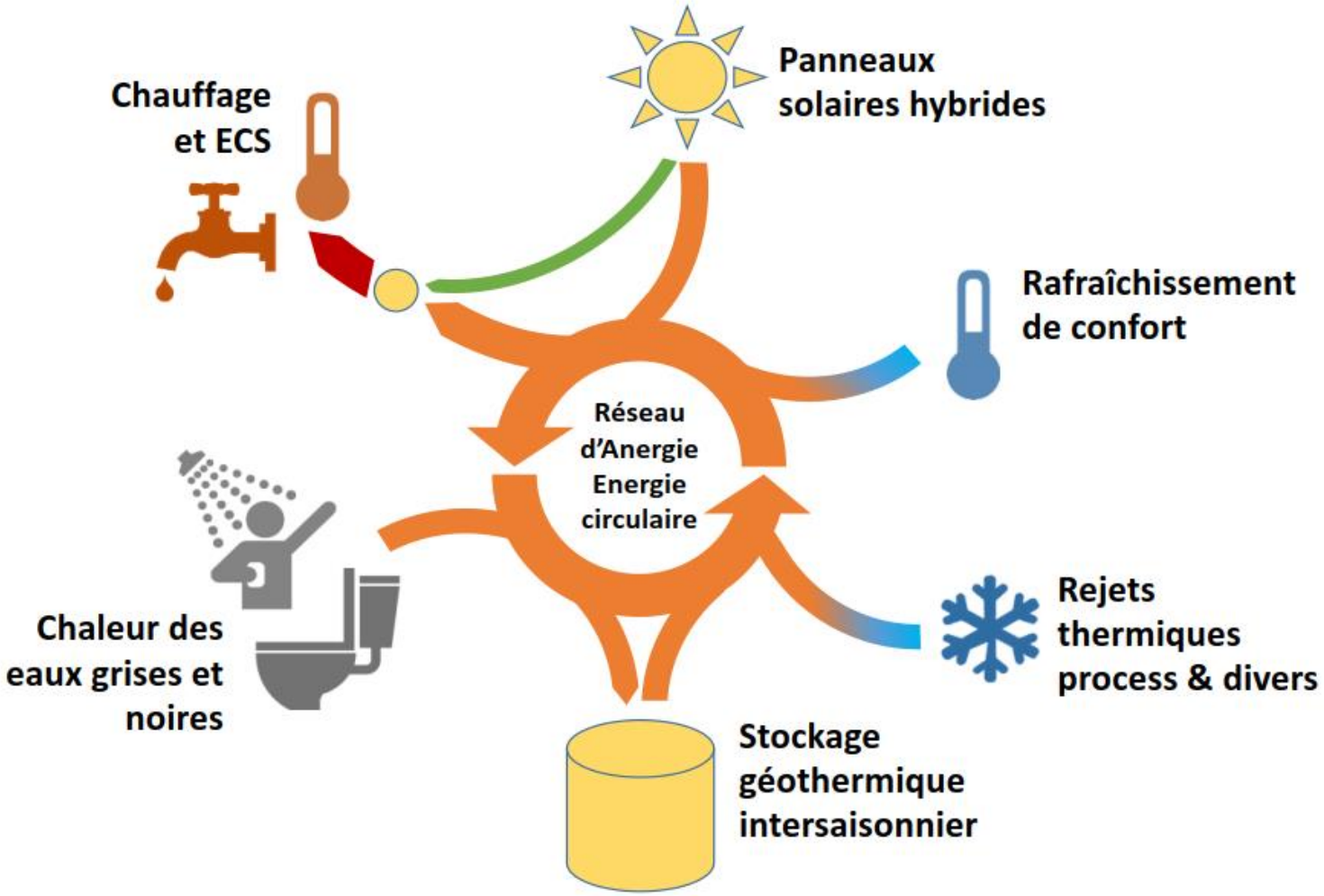
RICHTI Areal, Zürich



Quartier des Vernets, Genève

Ferney-Voltaire, près de Genève

Valorisation de la chaleur fatale



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Questions ?

Merci

pour votre attention