BRUXELLES ENVIRONNEMENT

LEEFMILIEU BRUSSEL

- IBGE·BIM -

L'ADMINISTRATION DE L'ENVIRONNEMENT ET DE L'ÉNERGIE DE LA RÉGION DE BRUXELLES-CAPITALE

10 february 2010

Study day – shallow geothermy a geological potential in Belgium ?

overview of the legislation in the Brussels region

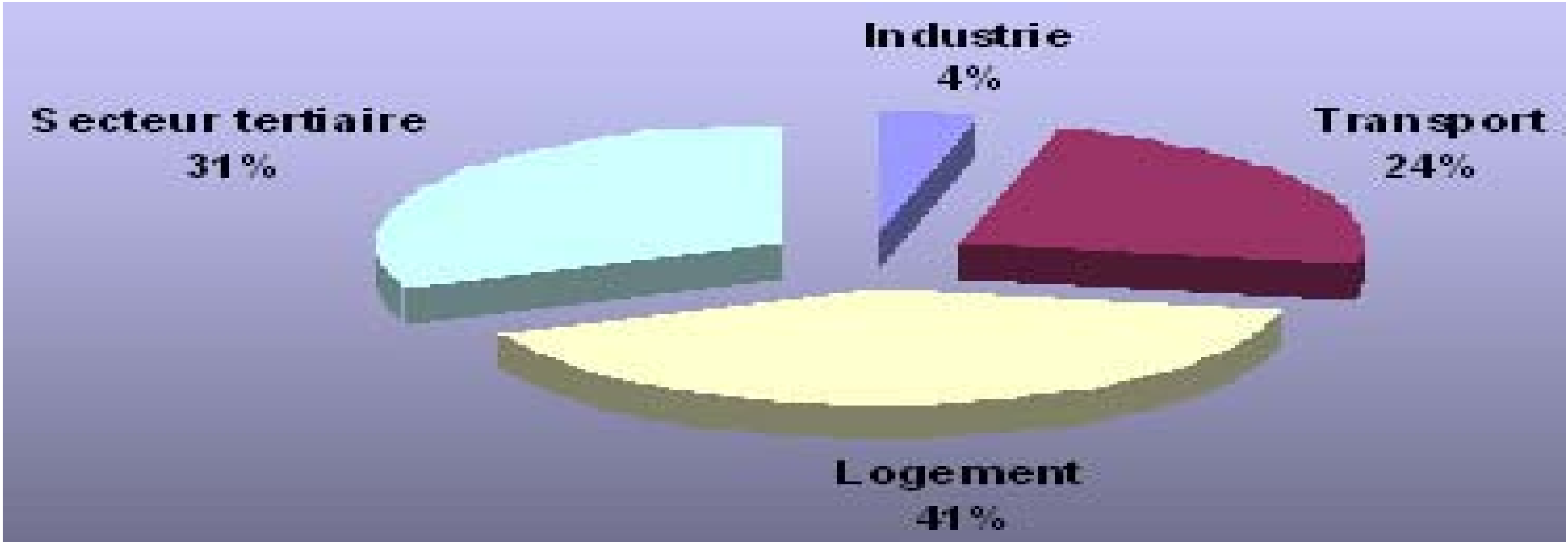
Stephan Plettin

IBGE – Bruxelles Environneme

BIM – Leefmileiu Bruss

Buildings = 70% of total consumption
(housing, offices, trades, hospitals,….)

Residential (housing) ± 40% of total consumpti
Tertiary sector (offices,…) ± 30% of total consumpti



Open system

In the winter: Geothermal heat pump (HP) with groundwater at the evaporator side of the HP

⟹ needs groundwater extraction and re-injection

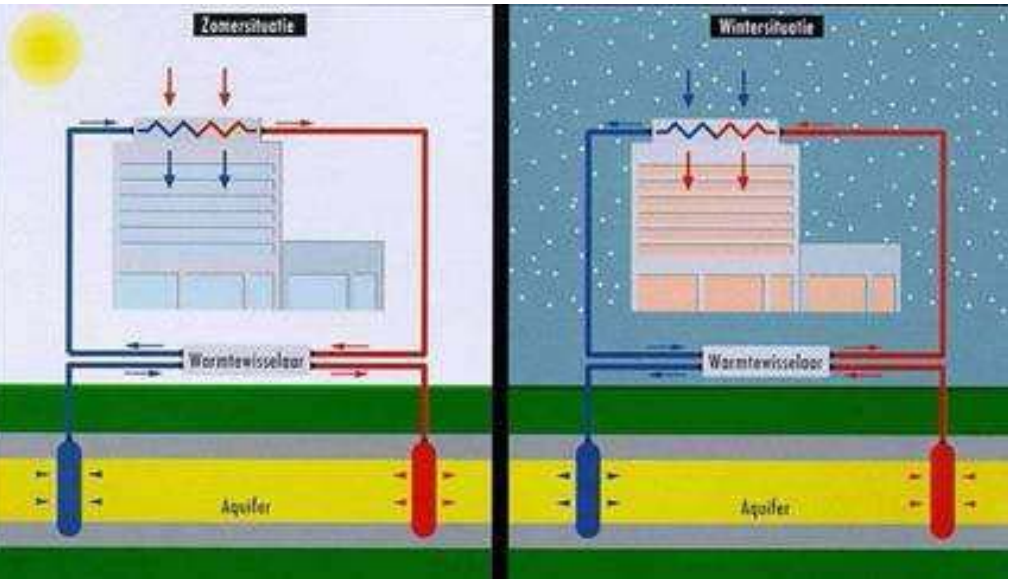
⟹ if you use the system for cooling (geocooling) in the summer (with a plat head exchanger or with reversible HP)
than we speak about *ATES (Aquifer Thermal Energy Storage)*

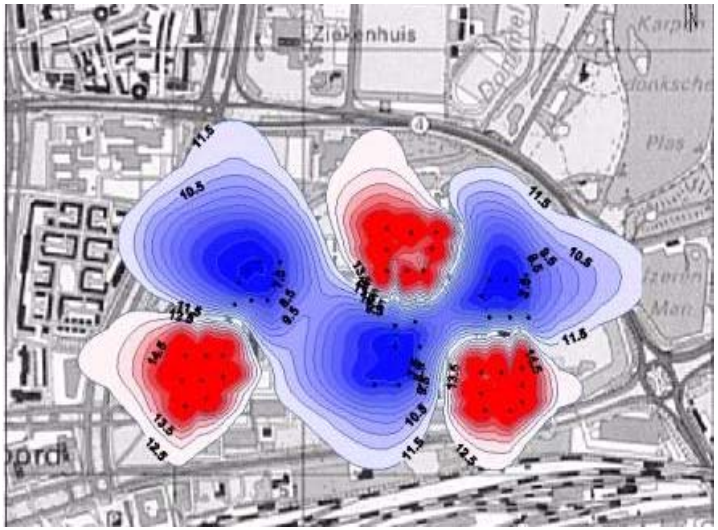
Closed system

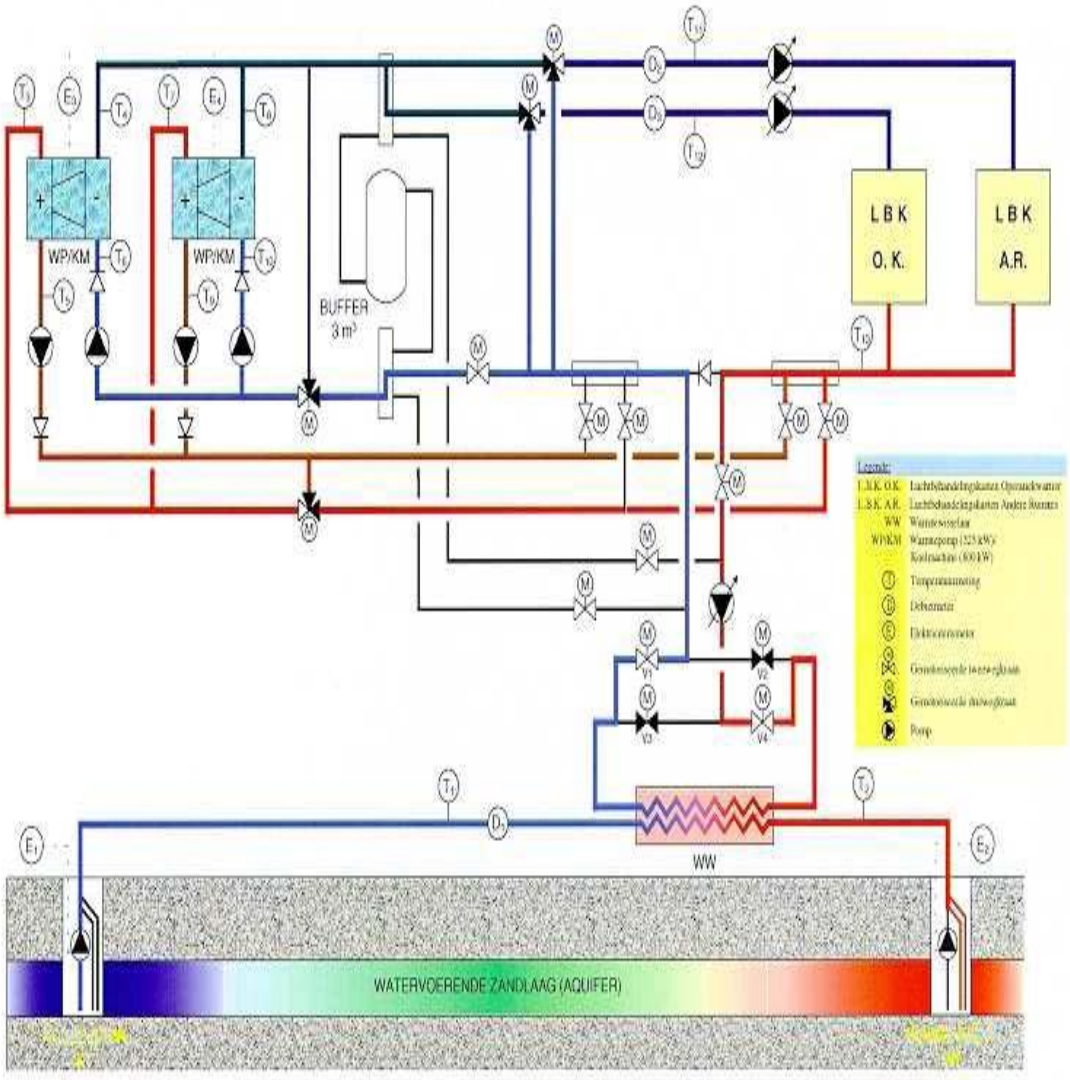
In the winter: Geothermal heat pump (HP) with a mix of water and glycol at the evaporator side

⟹ needs a field of vertical geothermal probes

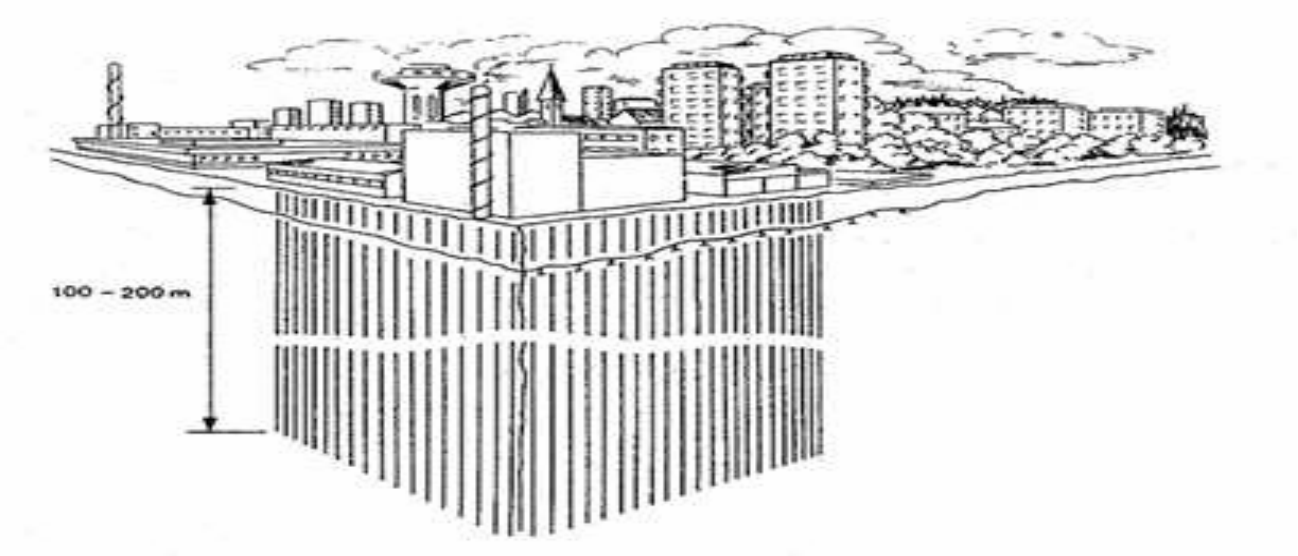
⟹ if you use the system for cooling in the summer (with a plate head exchangeror or with reversible HP)
than we speak about *BTES (Borehole Thermal Energy Storage)*

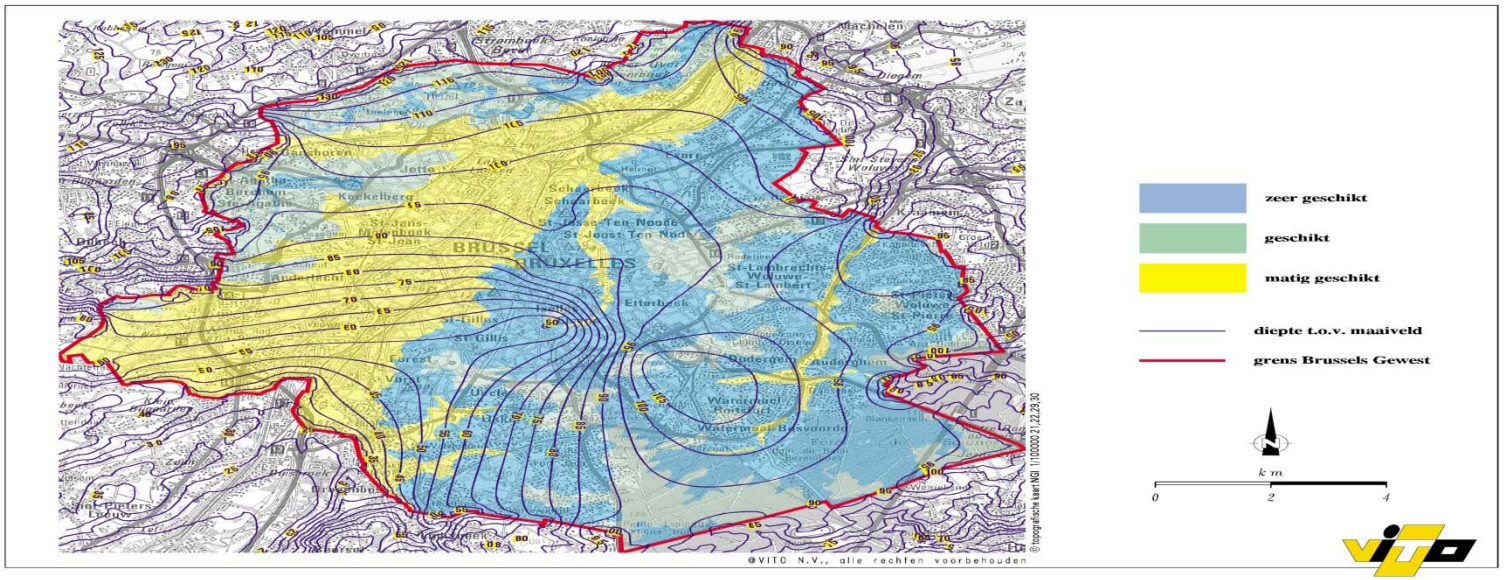

Zomersituatie
Wintersituatie
Warmtewisselaar
Warmtewisselaar
Aquifer
Aquifer


Ziekenhuis


WP/KM
WP/KM
BUFFER
3 m³
LBK
O. K.
LBK
A.R.
WW
WATERVOERENDE ZANDLAAG (AQUIFER)

BTES (Borehole Thermal Energy Storage)

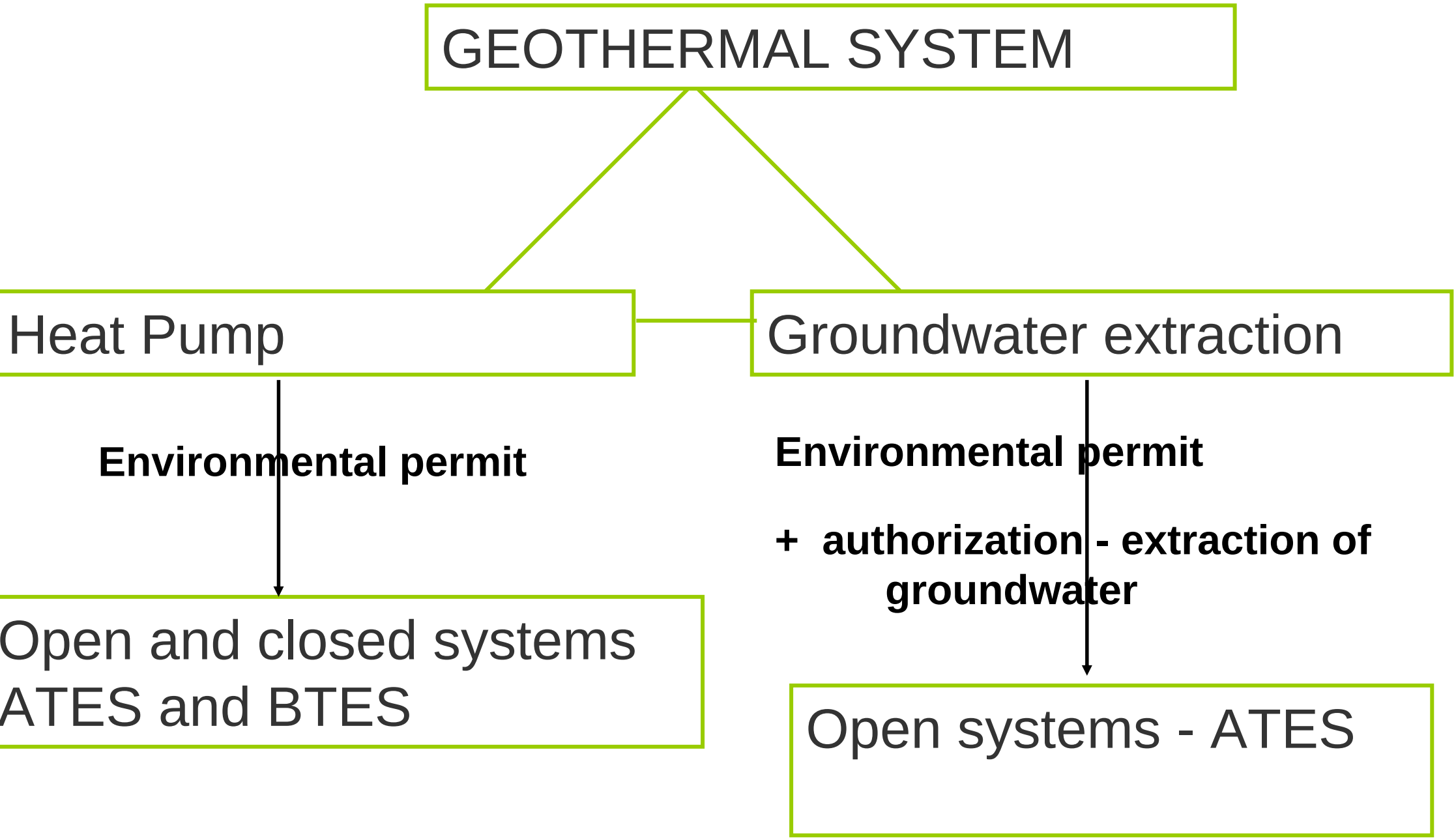




permit for a geothermal system

tuation at the end of january 2010

Environmental permit	BTES	ATES	HP + horizontal probes	Canadi well
Number of applications	**12**	**4**	**1**	**2**
delivered	7	3	1	2
n treatement	3	0	/	
abandoned project	2	1	/	


GEOTHERMAL SYSTEM
Heat Pump
Groundwater extraction
Environmental permit
Environmental permit
+ authorization - extraction of groundwater
Open and closed systems ATES and BTES
Open systems - ATES

Groundwater extraction (with or without injection) is an activity submitted to an <u>environmental permit</u> (head. 62) – qualitative aspects (risk of pollutio

- **<u>Pumping with a waterflow > 20.000 m³/day => « class 1A »</u>**

⇒ competent authority = at the regional level = IBGE – BIM

⇒ Long procedure – max. 450days – public survey - opinion of various public authorities

!!! For low temperature geothermal systems with heat pump always less than 20.000 m³/day !!!

- **<u>Pumping waterflow > 96m³/day and < 20.000 m³/day => « class 1B »</u>**

⇒ competent authority = at the regional level = IBGE – BIM

⇒ Report of environmetal impact

⇒ Max; 160 days for the permit

- **<u>Pumping with a waterflow < 96 m³/day => « class 2 »</u>**

  => competent authority = municipality where the project is located

  => ± 60 days for the permit

<u>But: if it is a public applicant</u>

⇒ competent authority = at the regional level = IBGE – BIM

<u>PAY ATTENTION:</u>

if in a project you have more than one activity or installation submitted to a permit then type of the permit will be that of the activity or installation with the highest « class »

<u>Example:</u>

new building with an ATES of 60 m³/day (class 2) and with a carpark of 70 places (class 1B)

=> you have to request a permit of type 1B for the whole project (new building)

For a groundwater extraction (with or without injection) you need also a specific authorization - quantitative aspects

=> competent authority = IBGE – BIM

Specific authorization

as a mesure to enforce/apply a specific law regulating subterranean water use

Protection of the ressource limiting the pumping flow in function of local conditio (pumping well in the vicinity, level of the water table,…..)

different type of authorizations

- Authorization for a flow < 96m³/day
- Authorization for a flow > 96m³/day
- **Authorization for pumping and re-injection after passage over heat exchanger**

for an open system => this last type of authorization

A head pump contains substances depleting ozone layer

=> HP is an installation submitted to environmental permit

unction of electrical power of the compressor of the head pump

- **<u>Head Pump < 10 kW (electrical power)</u>**

  => no permit and no declaration

- **<u>Heat Pump > 10 kW and < 100 kW => « class 3» - declaration</u>**

⇨ competent authority = municipality

⇨ Declaration – simple procedure

- **<u>Heat Pump > 100 kW => « class 2 » - permit</u>**

=> competent authority = municipality where the project is located

=> ± 60 days for the permit

<u>But: if it is a public applicant</u> => competent authority = IBGE – BIM

REMEMBER !! General principle

if in a project you have more than one activity or installation submitted to a permit then type of the permit will be that of the activity or installation with the highest « class »

Exemple:

new building with an BTES with a head pump of 60 kW electrical power (class 3)
and a carpark of more than 50 and less than 200 places (class 1B)

⇒ you have to request a permit of type 1B for the whole project (new building)

Exemple:

new building with an BTES with a head pump of 60 kW electrical power (class 3)
and a carpark of more than 200 places (class 1A)

⇒ you have to request a permit of type 1A for the whole project (new building)

he request for a permit must contain a technical description

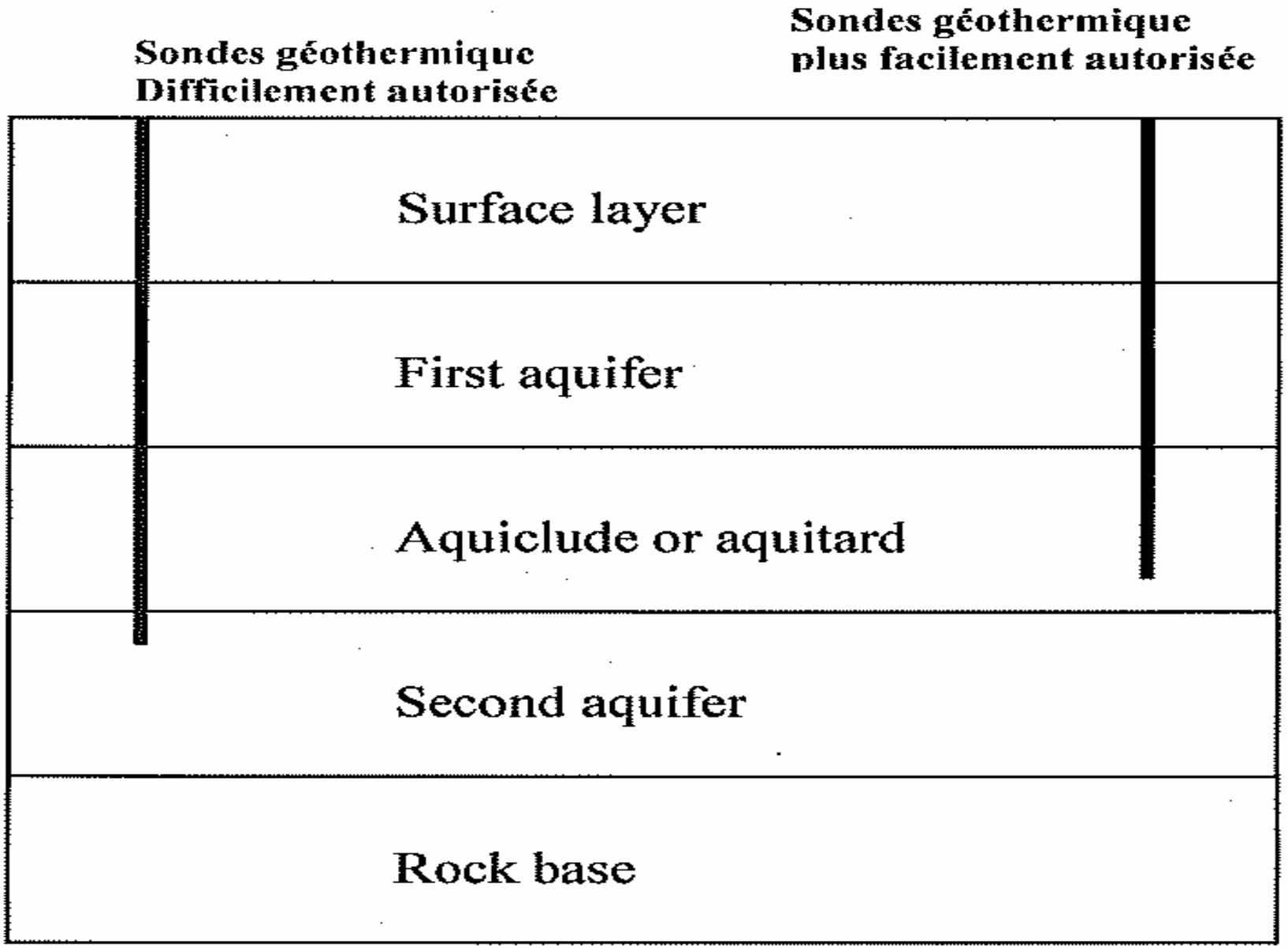
he system and its characteristics:

- characteristics of the building and his HVAC-system
- characteristics of the geothermal system and his integration the HVAC system
- geological and hydrogeological profile

Most of the time it's absent and we have to demand it !!!

<u>Examples of conditions included in a permit</u>

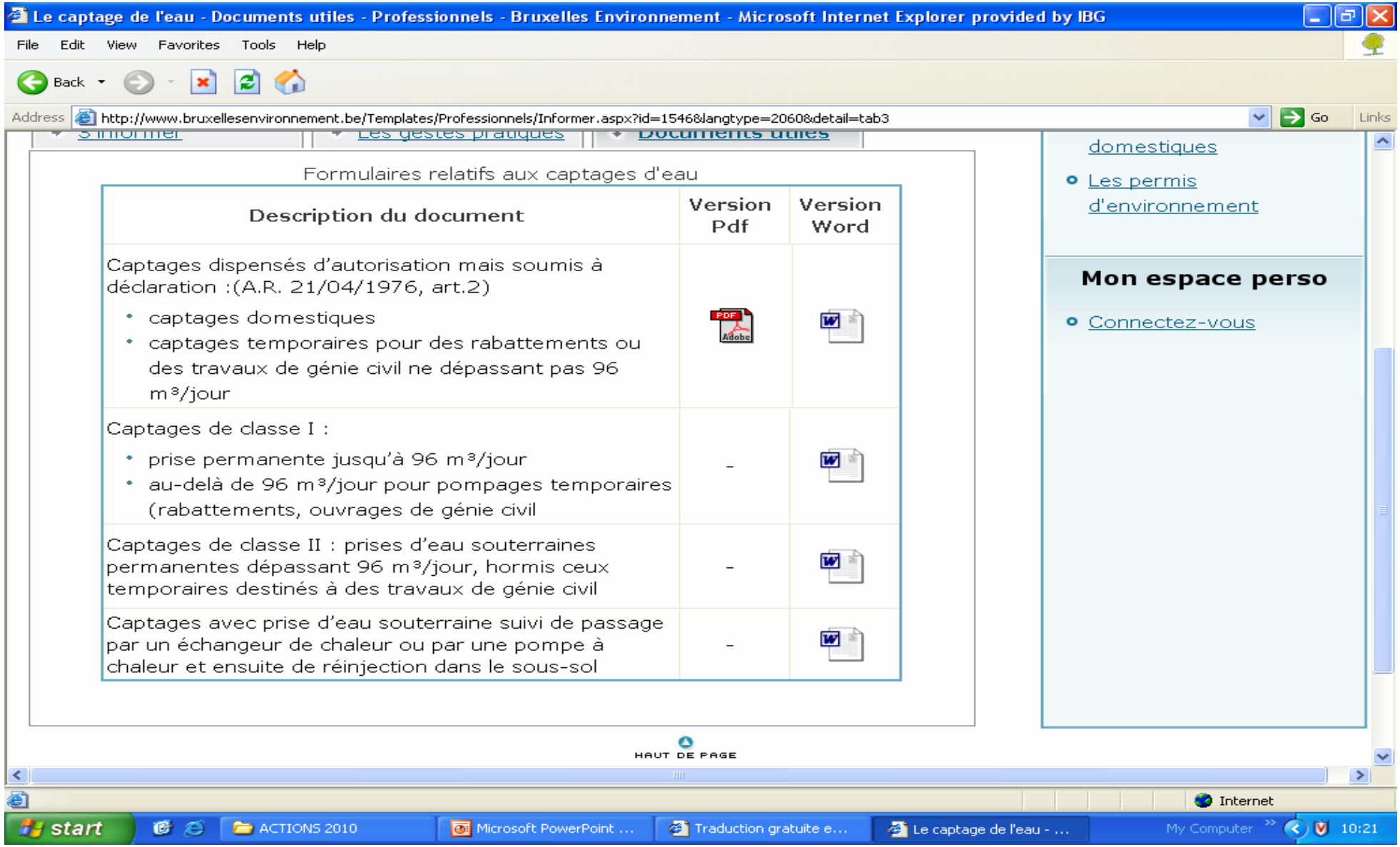
- bentonite stoppers in section of ground between 2 aquifers
- ATES: Limiting temperature of water re-injection at 25°C
- BTES: Use of monopropylene glycol instead of ethylene glycol
- obligation to place energy meters and to carry out a monitoring
- ……


Sondes géothermique
Difficilement autorisée
Sondes géothermique
plus facilement autorisée
Surface layer
First aquifer
Aquiclude or aquitard
Second aquifer
Rock base

SPECIFIC AUTHORIZATION for groundwater extraction

www.ibgebim.be or www.bruxellesenvironnement.be

Accueil > Professionnels > Thèmes > Eau > le captage d'eau > **Documents utiles**



ABOUT THE ENVIRONMENTAL PERMIT

Accueil > Professionnels > Guide du permis d'environnement

ABOUT THE FINANCIAL SUPPORT for Rational Energy use in buildings

Accueil > Professionnels > Themes > Energie > Les aides financières > Primes Energie > Primes Energie 2010 > **Secteur tertiaire et industriel**

- *étude de faisabilité => 50% du montant de l'étude*.
- *Pompe à chaleur => 30% de la facture*
- *……*

Merci pour votre attention!

dank u voor uw aandacht !