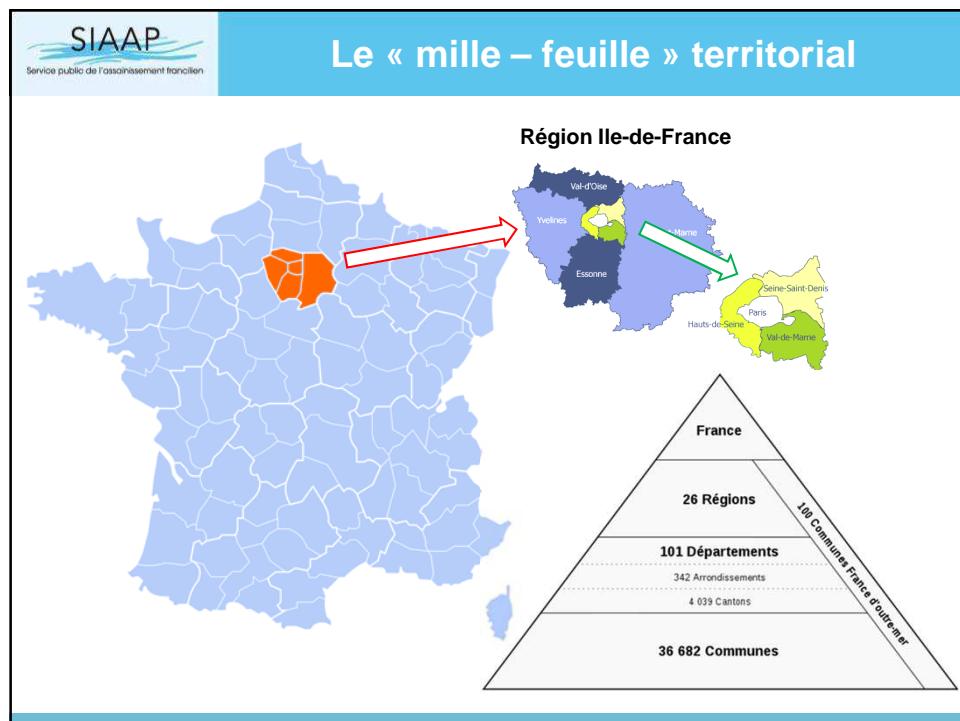


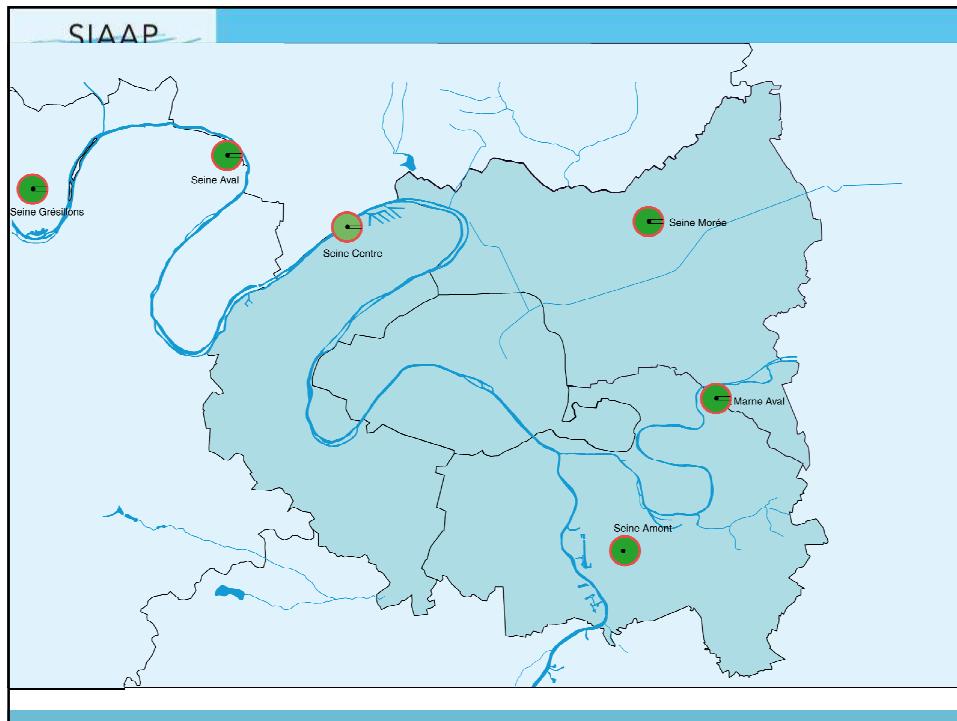
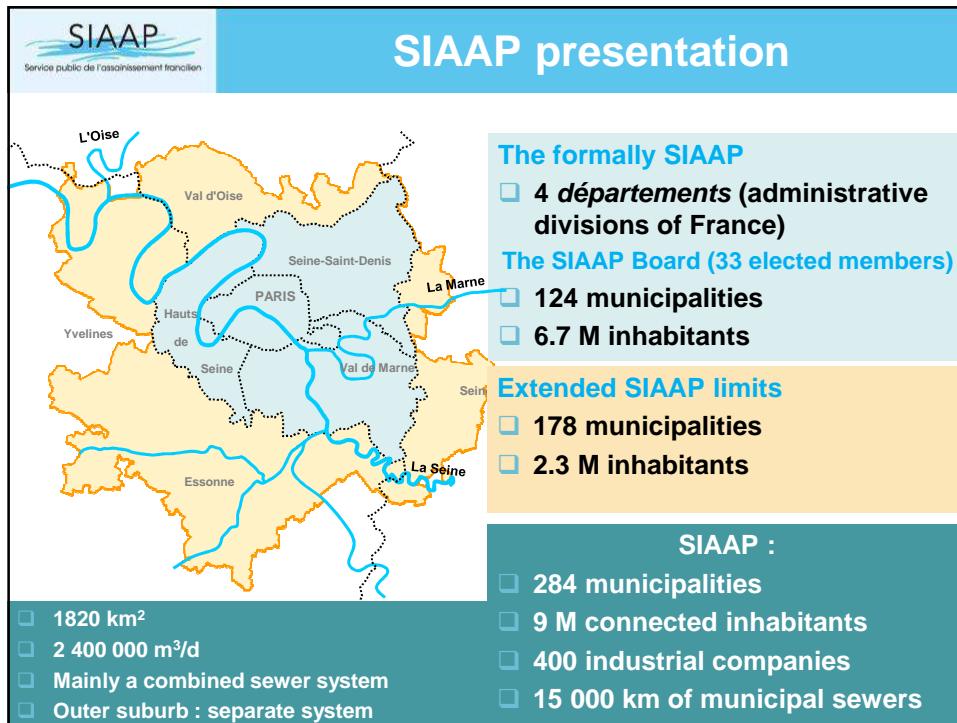
Separate urine collection in Paris Region

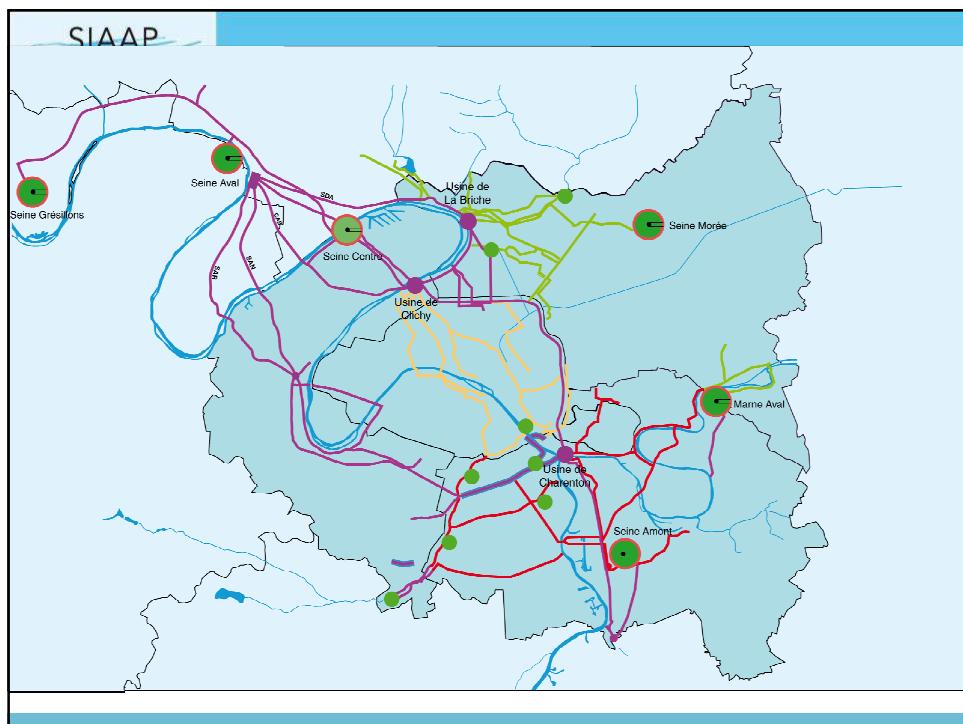
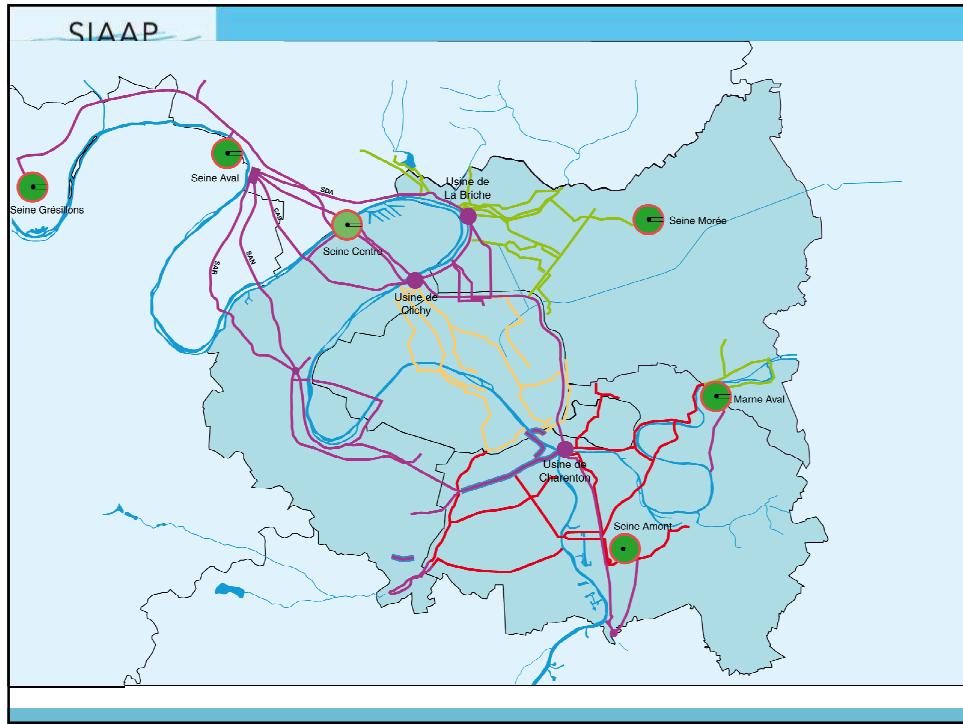
**Direction de la Stratégie Territoriale
Jean-Pierre TABUCHI**

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Nomix toilets



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The questionning (1/2)

- The Greater Paris**
 - 2030 : 9,6 M inhabitants (+ 700 000 inhabitants)
 - 2050 : ? > 10 000 000 inhabitants ?
- Climate change effects**
 - 2030: ?
 - 2050: Seine river will decrease by 15 to 40 %

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The questionning (2/2)

Low flow
Decrastin

Rising pollutants
production

Higher
Yields & Reliability

Good Status

Seine River quality

5,3 t 4 t

NH_4^+
 NO_2^-
 PO_4^{3-}

What are the alternatives for sanitation ?

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Findings 1/4

SIAAP's treatment capacities:

Année	Q (m ³ /j)	DBO ₅	NTK
2030	83.9%	95%	106%

Rendement NH4

Facility	% Eliminé	% Rejeté
SAV	91%	9%
SAM	99%	1%
SEC	97%	3%
SEG	98%	2%
MAV	97%	3%
SEM	99%	1%

$\text{FeCl}_3 : 51\ 000 \text{ t/an}$
 $\text{MeOH} : 31\ 800 \text{ t/an}$

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Findings 2/4

□ Biological treatment is based on ratios:

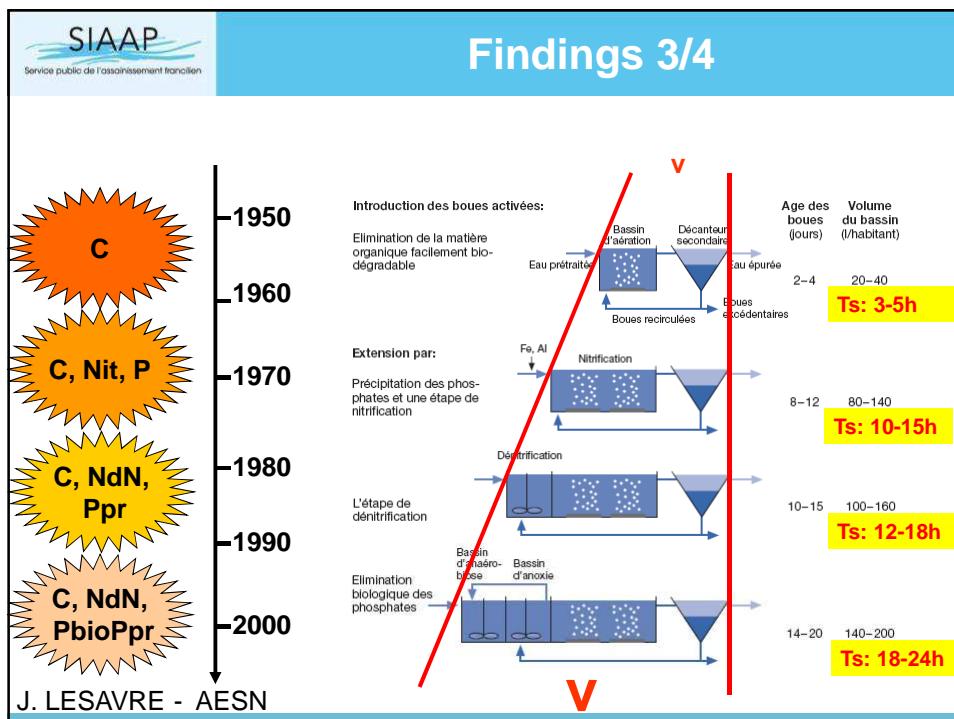
BOD5	N	P
100	5	1

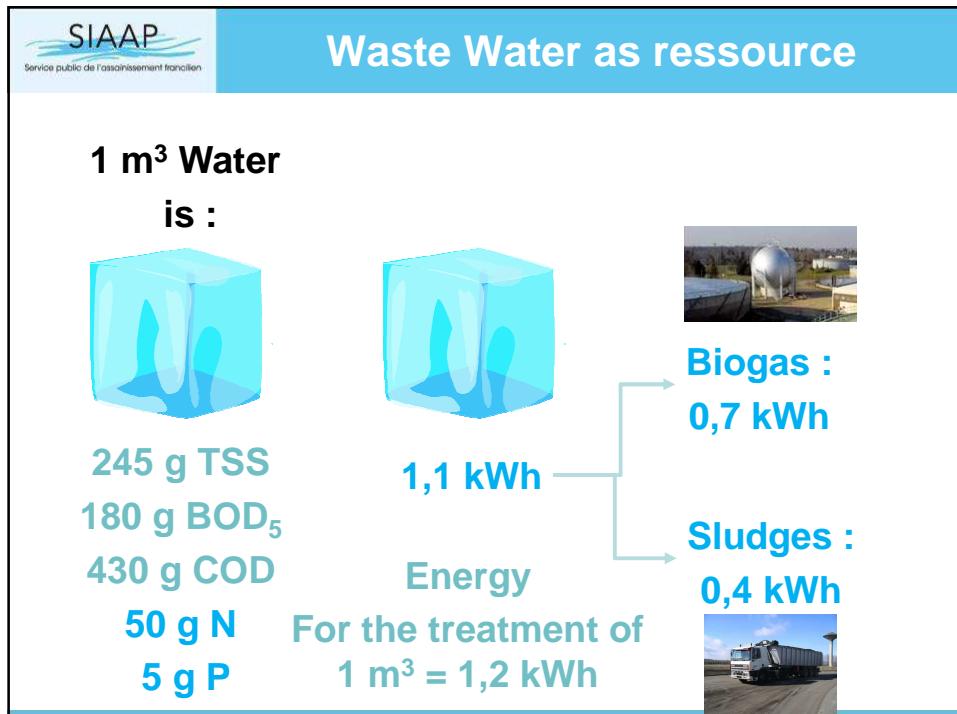
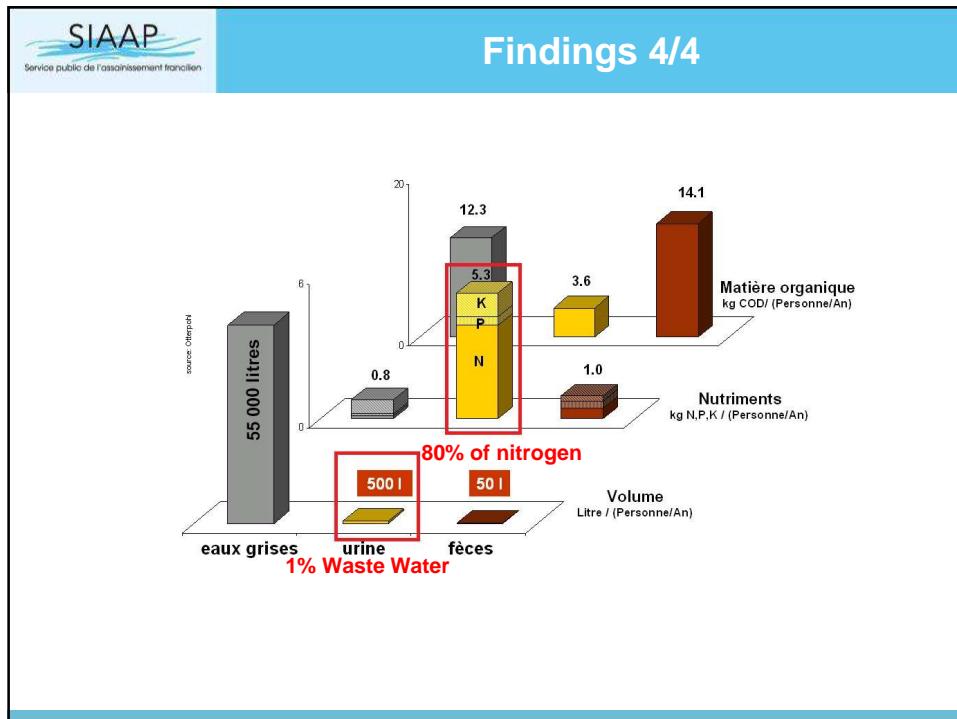
□ Waste ratios:

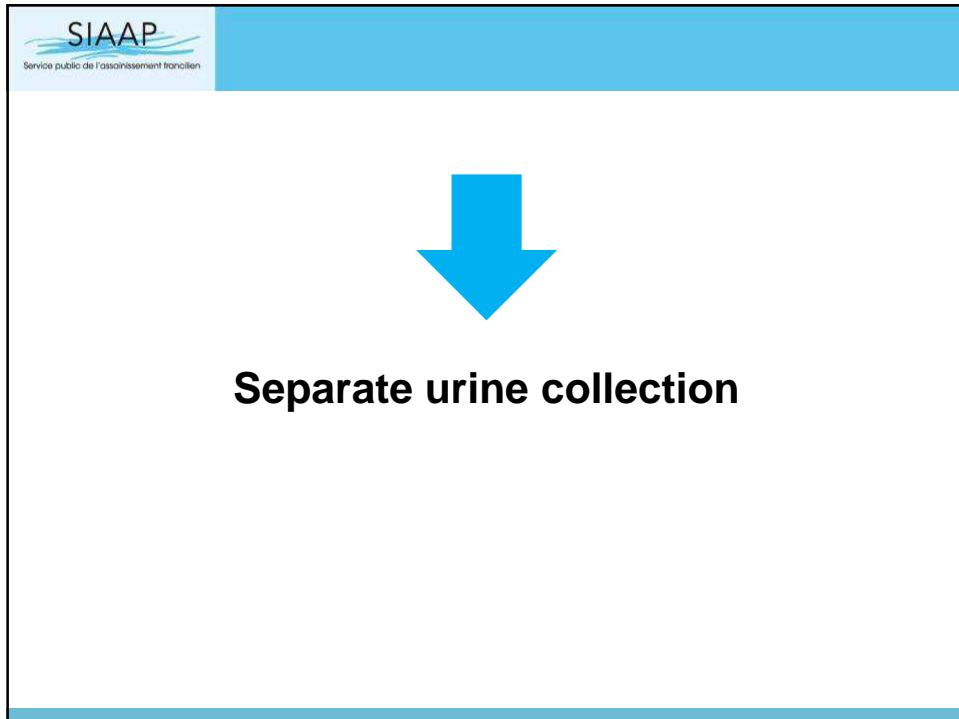
BOD5	N	P
100	19	2

□ Nitrogen is a problem:

- Difficult to treat
- Disqualifying parameter for river quality







The slide features the SIAAP logo at the top left. The main title "References" is centered at the top in a white, bold, sans-serif font. Below the title, the text "Sweden: 200 references" is displayed. To the right of the text, there is a map of Sweden with a green silhouette. Numerous red dots are scattered across the map, representing sampling locations. Labeled cities include Stockholm, Göteborg, Malmö, Uppsala, Örebro, Linköping, Lund, Borås, Jönköping, Karlstad, Östersund, and Gävle. The word "SWEDEN" is written vertically along the right side of the map. To the right of the map, three additional text entries are listed: "Switzerland : EAWAG research program", "Germany : Hamburg", and "Netherland".

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Urine collection

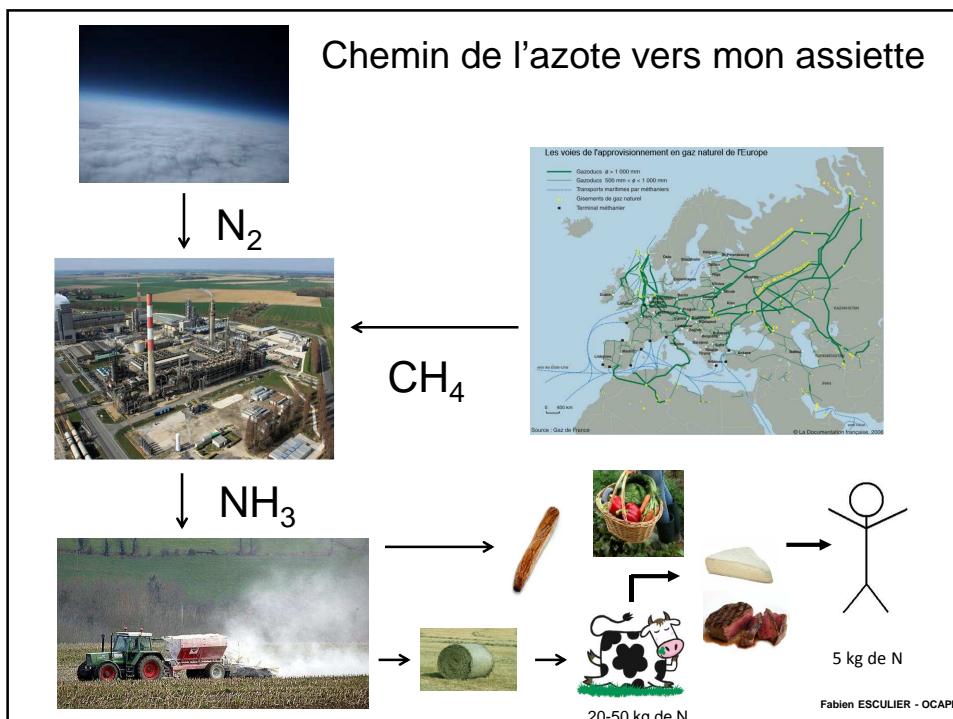
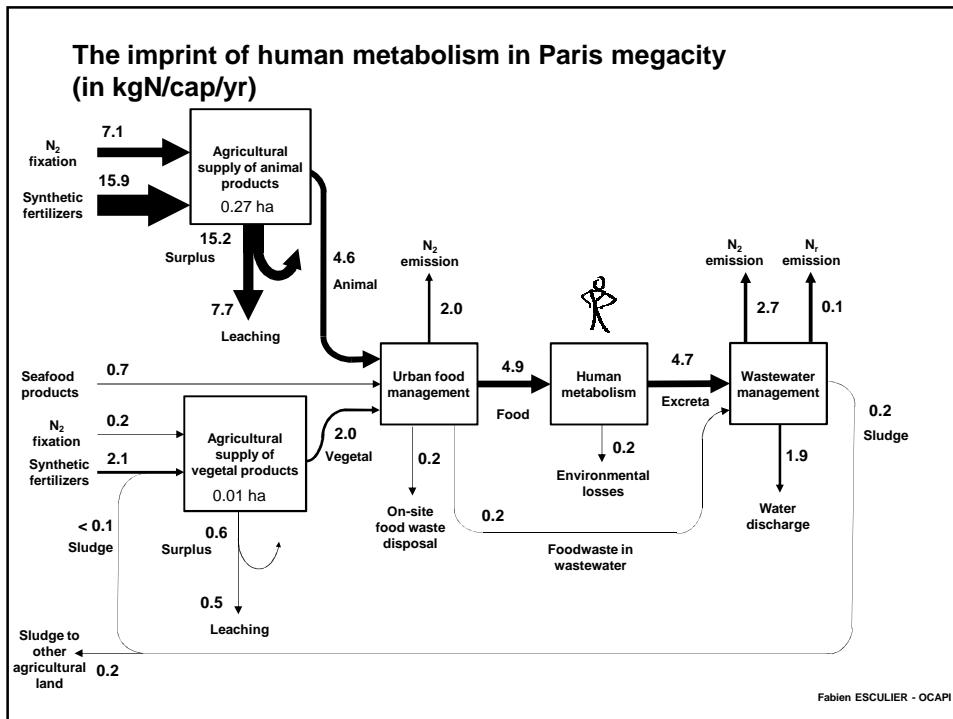
URINE

- Secure tank cover to minimize the risk of children falling into the tank. Emptying through manhole is preferred
- The urine level in the tank should be easy to control
- The tank should be filled from the bottom

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What to do with urine ?

<input type="checkbox"/> Separate treatment of urine	<input type="checkbox"/> Nitrogen & Phosphorus recovery
<ul style="list-style-type: none"> ■ Steady load ■ Steady flow ■ Higher concentration ■ More efficient treatment ■ Anamox 	<ul style="list-style-type: none"> ■ Urine is a good fertilizer



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The Outputs

- Storage (6 month pH 9): sanitization**
- Volume reduction (EAWAG, Suède)**
- Nutrients recovery for agriculture**
 - Direct spreading
 - Phosphorus recovery by struvite precipitation: $MgNH_4PO_4$
 - Nitrogen recovery: stripping of urine or ion exchange

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What objectives in the frame of the Greater Paris

- Modifying the sewage composition to fit with SIAAP's treatment capacity**
1 million inhabitants out of the system
- Grey water and faeces: to sewers**
- Focus is put on:**
 - New collective housing
 - Tertiary sector**420 000 new housings**

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ZAC des Batignolles, a new development area

- 5200 inhabitants**
- 3100 employees**
- Objective : working on a real case**
- Number of tanks,**
- Location**
- Number of trucks for emptying**

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Environmental assessment

Hypothesis:

- Transport truck (capacity de 10 m³)
- 1 million inhabitants
- 1,5L/day/inhab.
- Struvite production
- Anamox treatment

The map shows the Paris basin and surrounding regions like the Seine, Marne, Oise, and Eure basins. A green truck icon is overlaid on the map, with the text '150/jour' written on its side.

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Evaluation environnementale

Carbone balance for classical centralized treatment

- 59 575 t eq CO₂/year

Carbone balance for urine treatment :

- 1 491 t eq CO₂/year

A green truck icon with a blue water drop above it is positioned next to a large light blue arrow pointing to the right. To the right of the arrow is the text '1100 km/day/truck'.

Conclusions

- ❑ Opportunity or utopia? Too early to answer...
 - A real technical interest
 - Real questions on social acceptance
- ❑ Undergoing projects :
 - Pilot facility in SIAAP main WWTP Seine-Aval
 - Thesis undergoing
- ❑ A well designed toilet is a key point for the development on urine separate collection

Merci de votre attention

