Technologic opportunities for mitigation efforts by the water industry

M. Coeytaux

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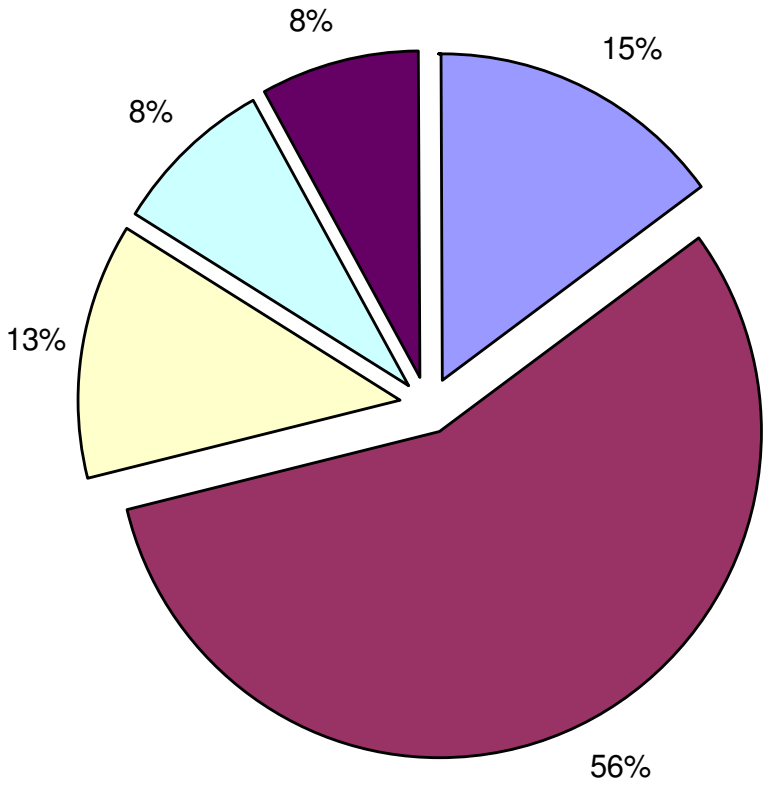
Mitigation efforts

- Consuming less

and

- Producing more

Consuming less



Typical power consumption

- Pretreatment+settling
- Biological treatment
- Tertiary+Thickening+Dewatering
- Heating+Ventilation
- Others (lighting,utilities)

Consuming less 2

In the biological treatment

- At design level
  1. Efficient primary treatment
  2. Anaerobic treatment where possible
  3. Sharon or Anammox process for N removal

- At operation level
  1. Multiparameter control system

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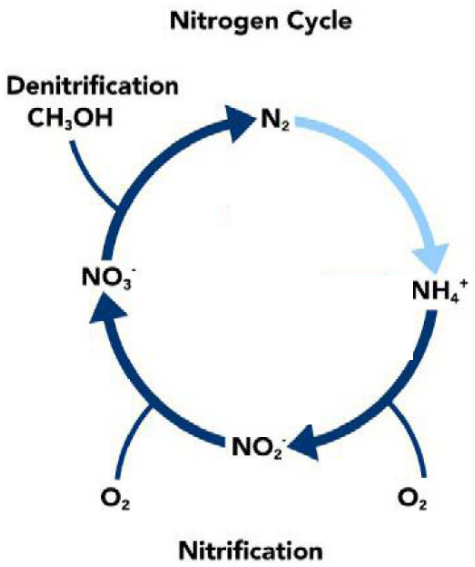
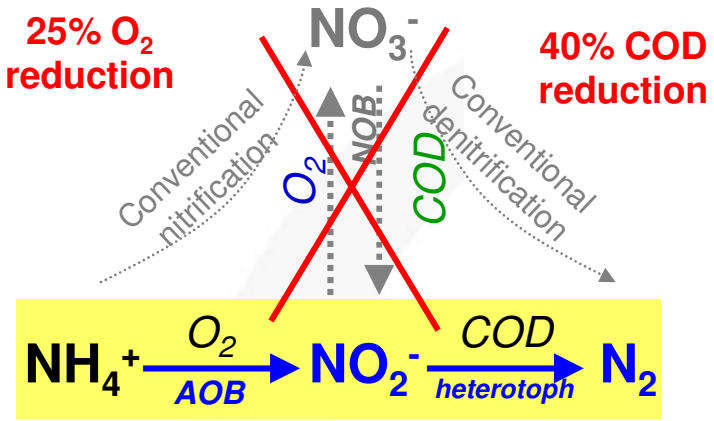
Consuming less

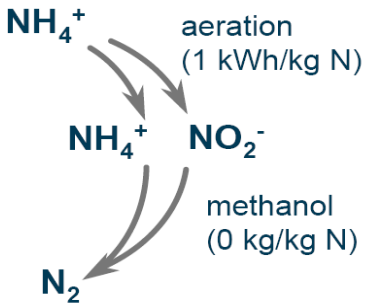


Conventional



Nitrate shunt

Canon / Anammox



0.7 ton CO_2/ton N

Anammox

	O_2	C
Conventional	100	100
Shunt	75	60
Anammox	40	10

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Consuming less

- In the equipments
  - Design level

    High efficiency equipments
    - Electrical motors
    - Blowers
    - Frequency driven motors

  - Operation level
    - maintenance

Potential savings

10 to 20%

Potential savings

5% to 40%

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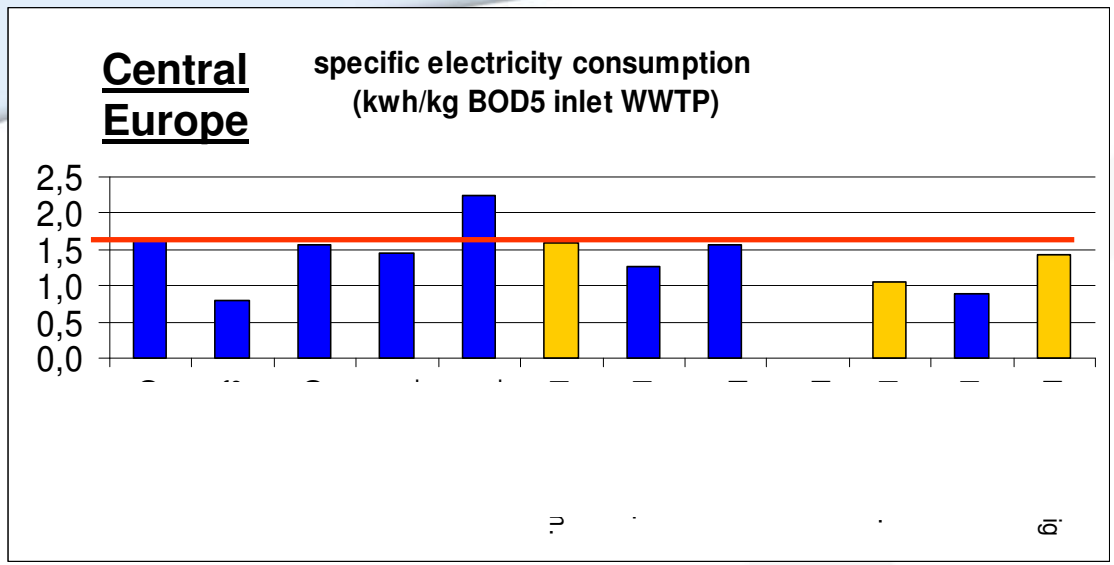
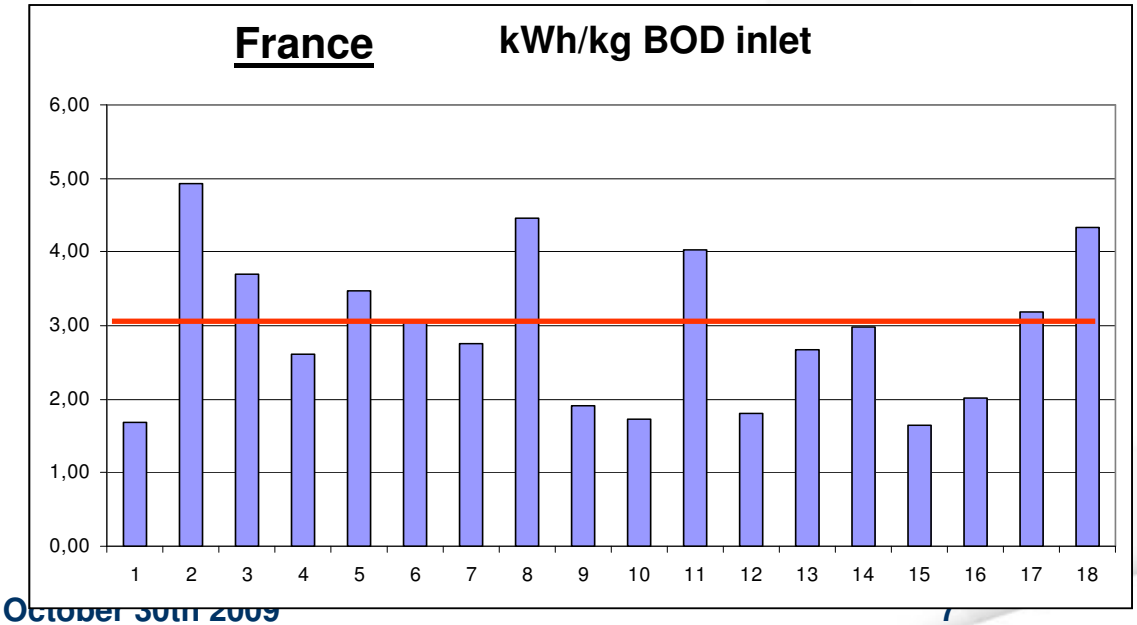
Consuming less



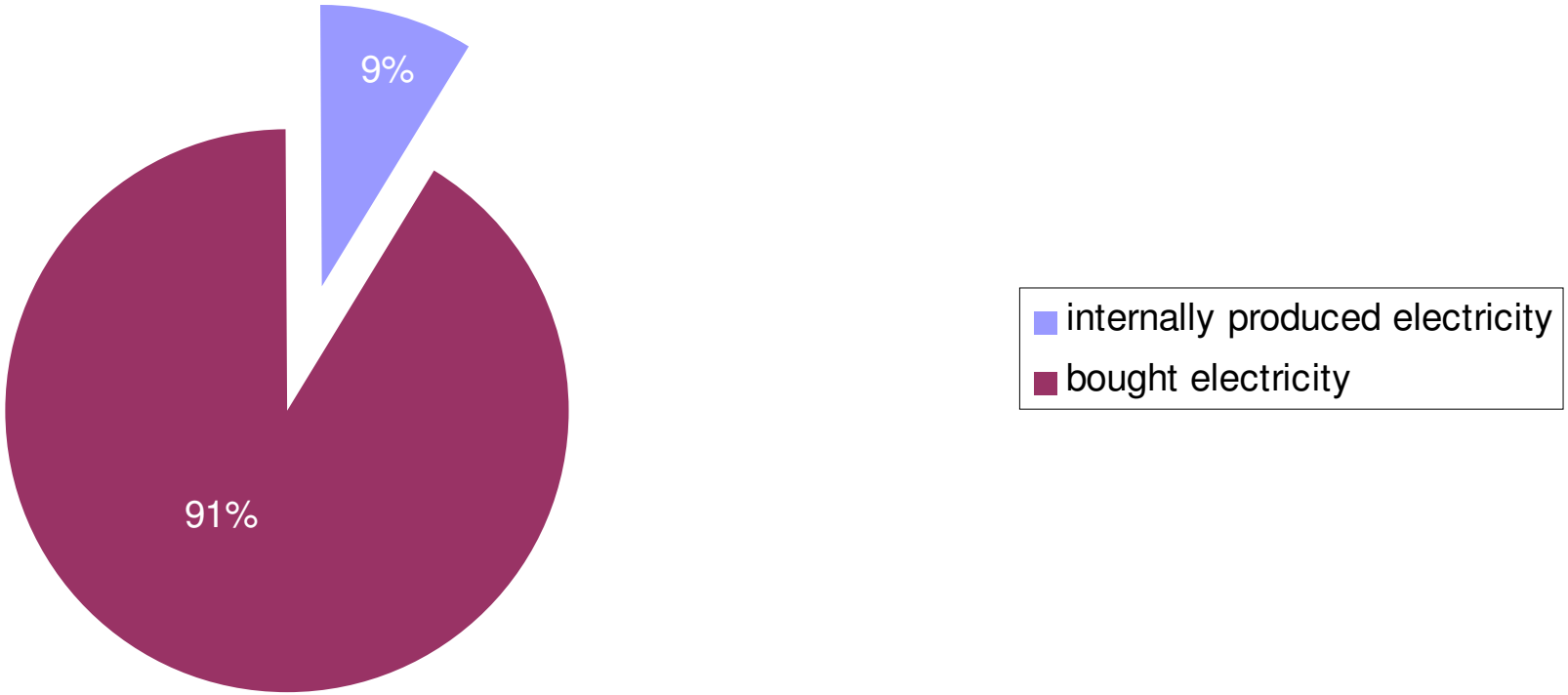


- Statistical difference explainable by:
  - Primary treatments
  - High efficiency equipments
  - Advanced control systems
  - Careful preventive maintenance

Producing more

1

Electricity sources for swedish WWTP



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Producing more 2

- Two ways to recover energy from sludge
  - Anaerobic digestion
  - Incineration

- Comparison of the performances

  (for 1 ton DS with 70% VM content)

  - Conventional Anaerobic Digestion:
    1. 40% reduction of VM ⇒ 645 kWe
    2. 60% reduction of VM ⇒ 970 kWe
  - Incineration:
    1. ~ 3 t of steam/tVM ⇒ 400 to 600 kWe

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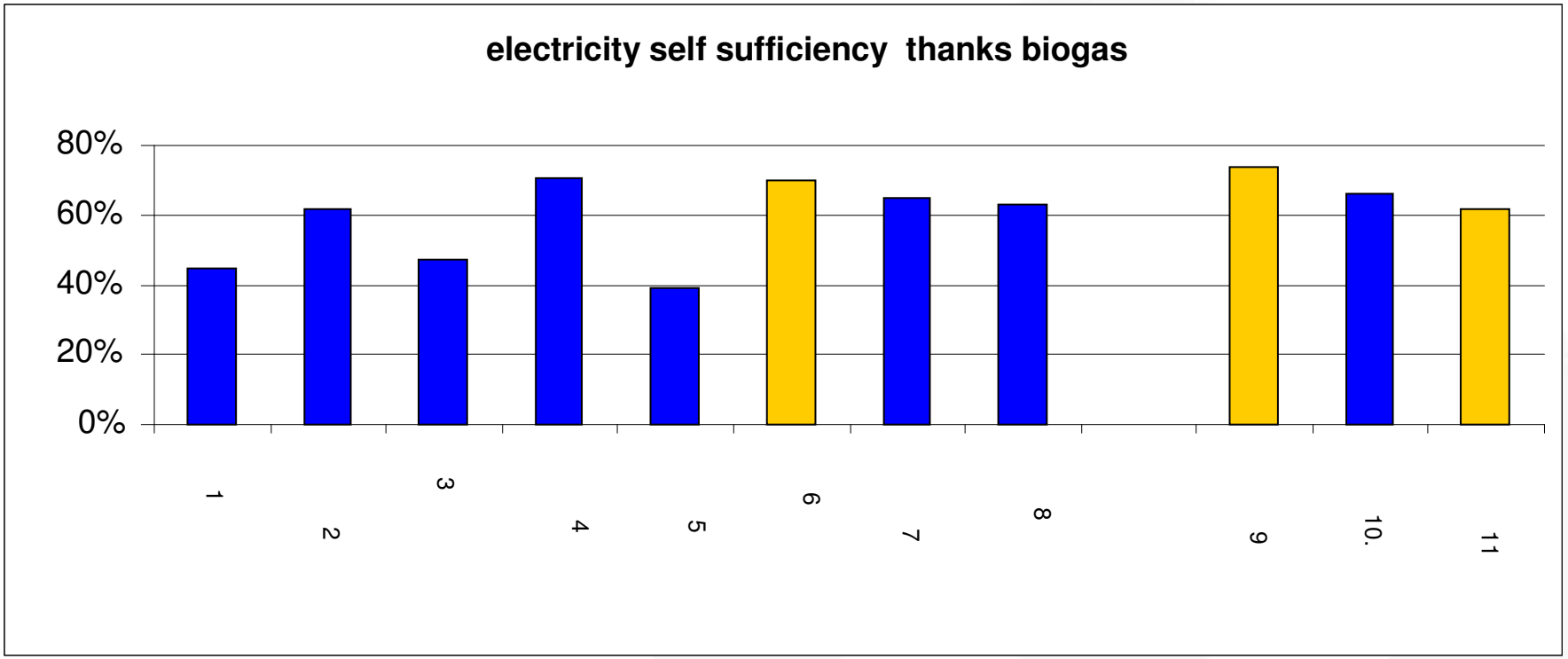
Producing more

3

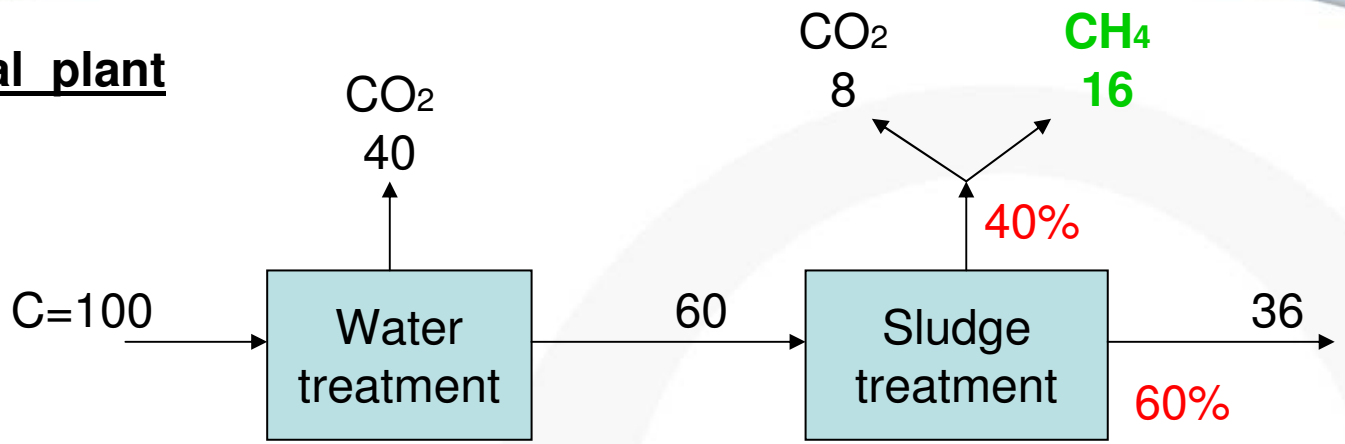


Mesophilic digestion

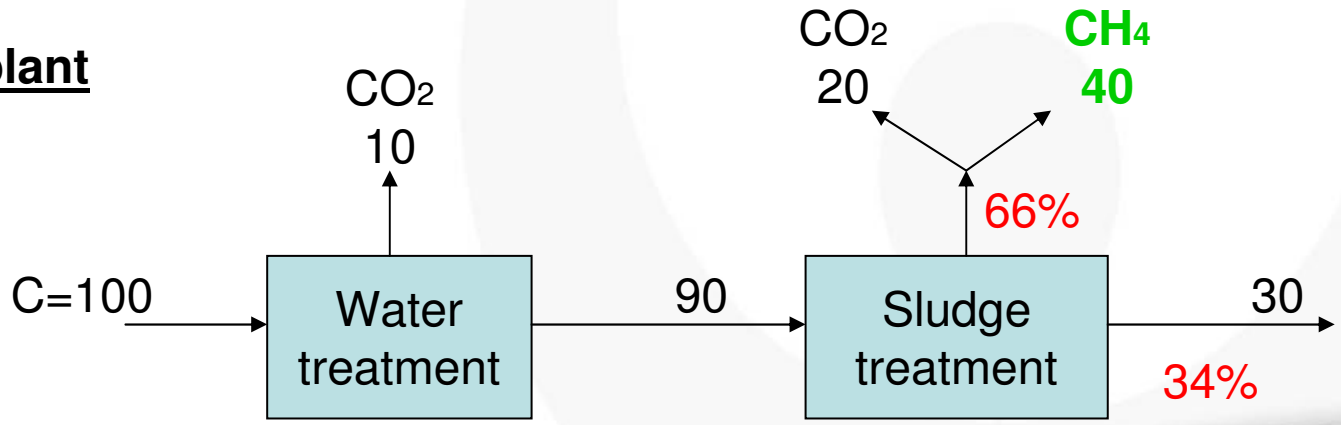
Thermophilic digestion

Ideal plant as summary

Classical plant



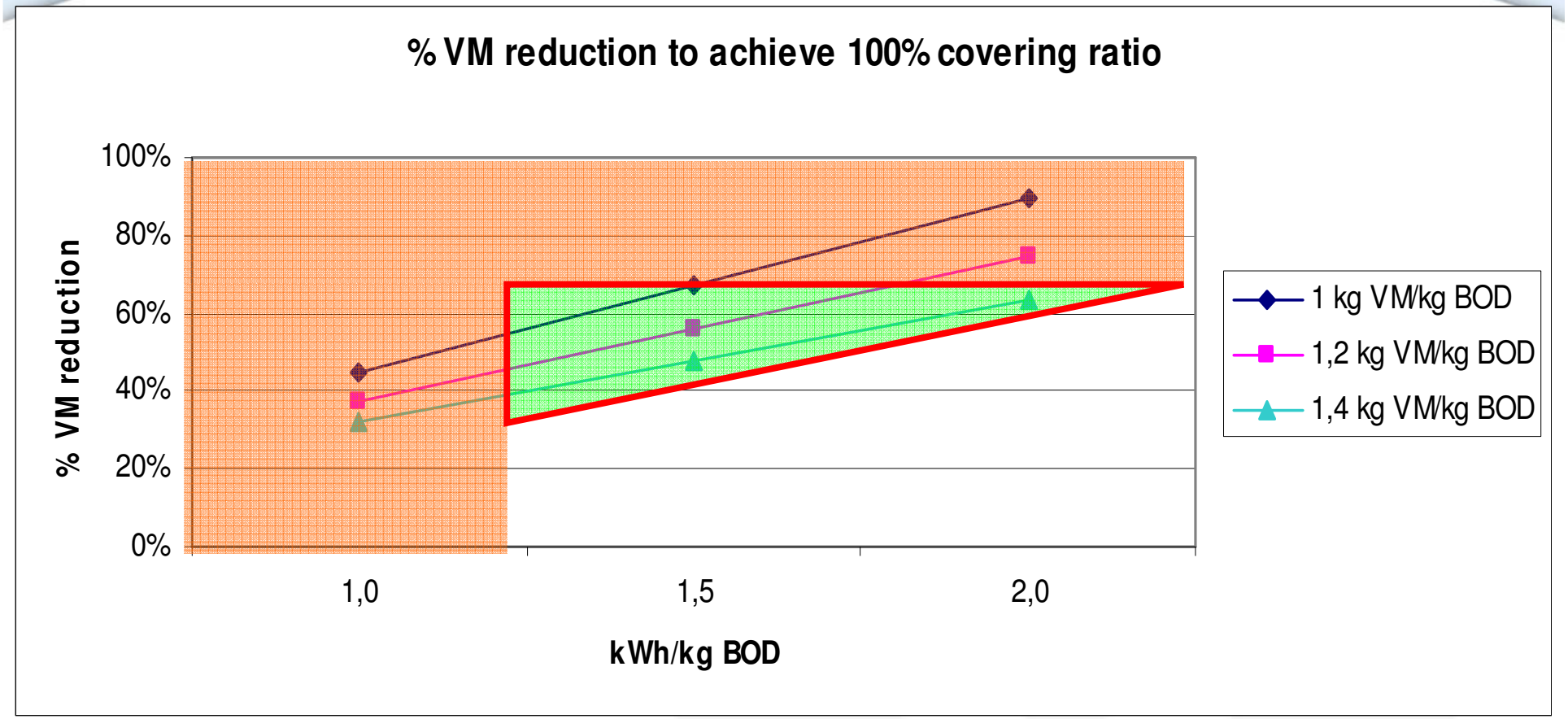
Ideal plant



And now ?

- How high could be the energy covering ratio?
- Which conditions ?

Feasability of energy self-sufficient plants



Thank You
for
Your attention

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