

wetsus
centre of excellence for sustainable water technology

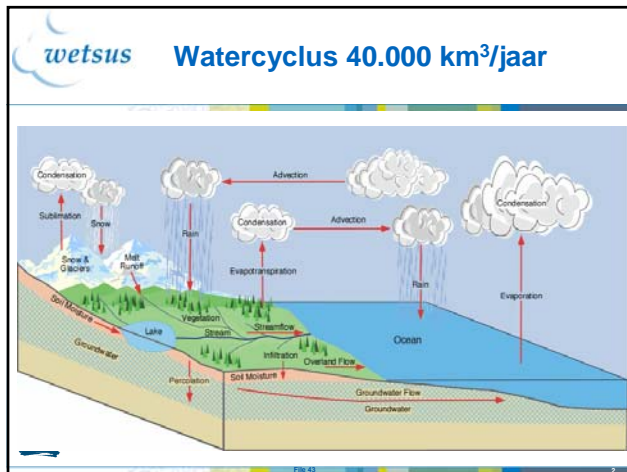
Water & Energie

De uitdaging van de toekomst

Cees J.N. Buisman

Franeker, 18 september 2009

combining scientific excellence with commercial relevance



wetsus World regional differences in availability and use

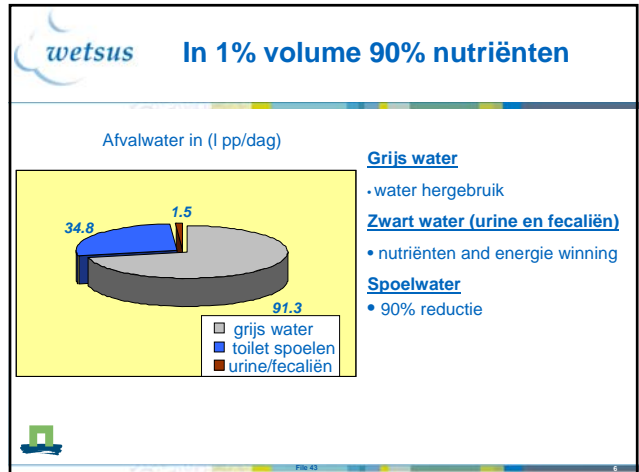
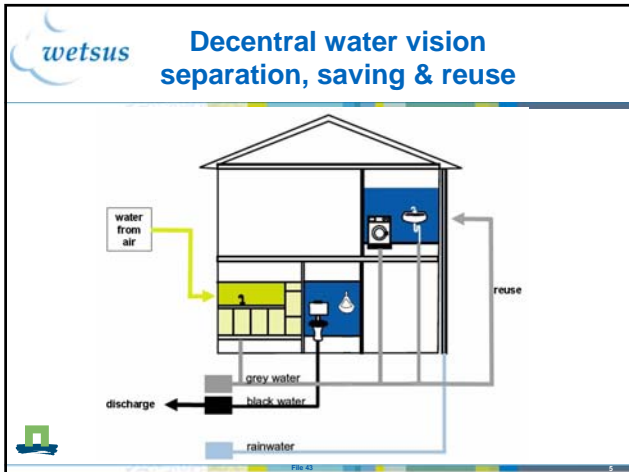
	NL	USA	Yemen	Singapore	Jordan
Consumption (m ³ /pers./year)	491	1688	162	59	155
Total consumption (km ³ /year)	8	502	3.5	0.5	0.9
Renewable (km ³ /year)	90	2478	4.1	1	0.9

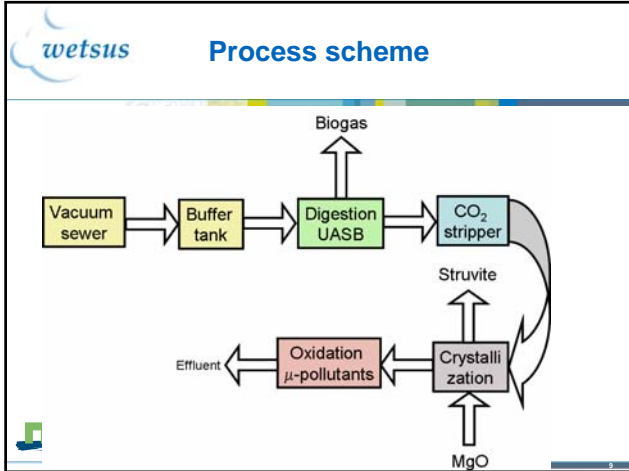
Total available: ± 40.000 km³/year

wetsus Oplossingen

A. waterhergebruik

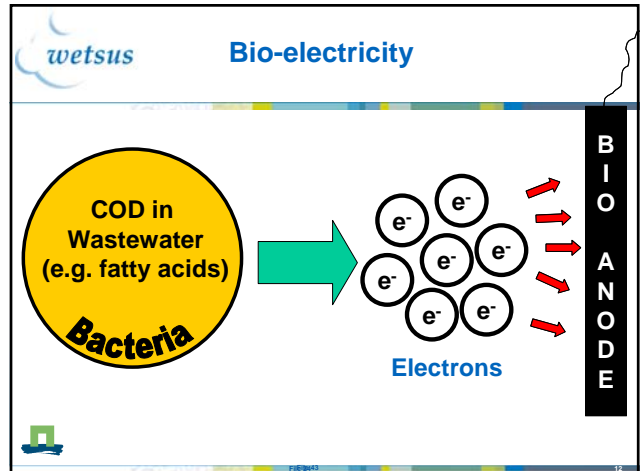
B. water uit de lucht

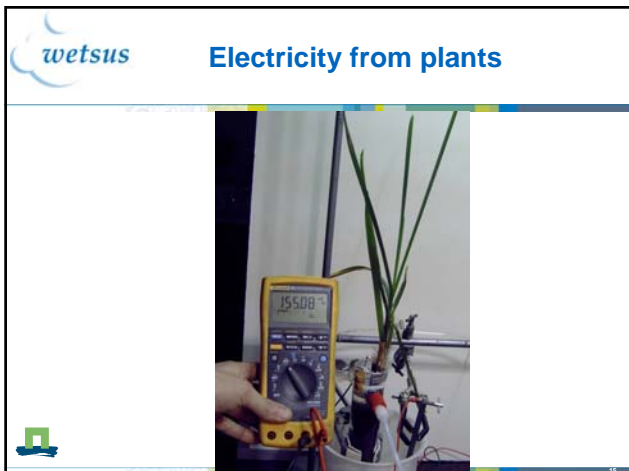
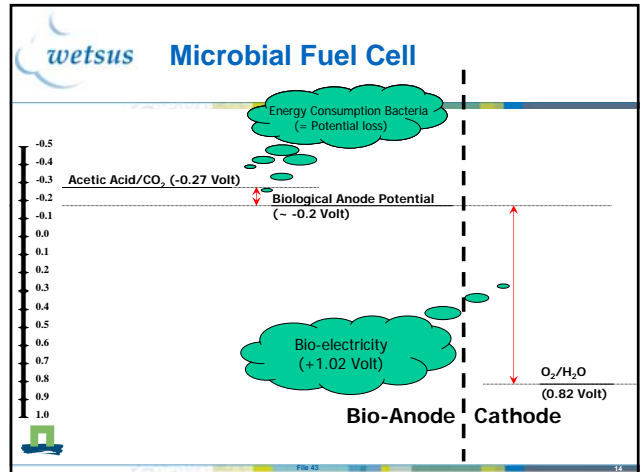
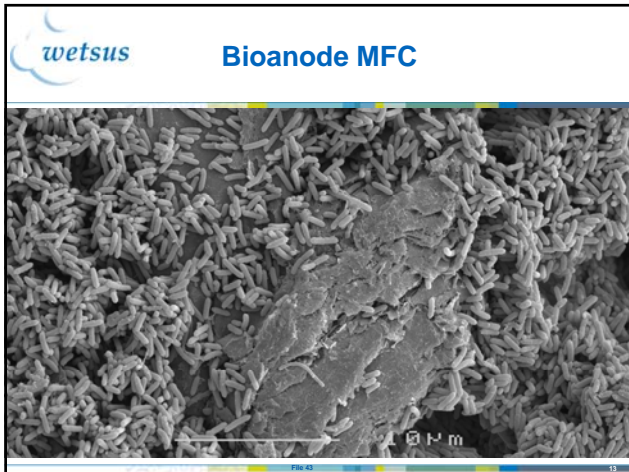




wetsus **Results pilot plant decentral sanitation**

Parameter	Removal efficiency (%)
Fatty acids	90
COD (tot)	96
N total	96
NH ₄ -N	97
P total	95
PO ₄ -P	95

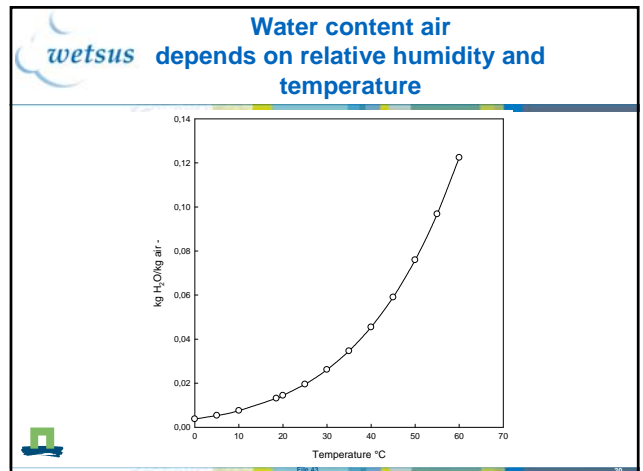
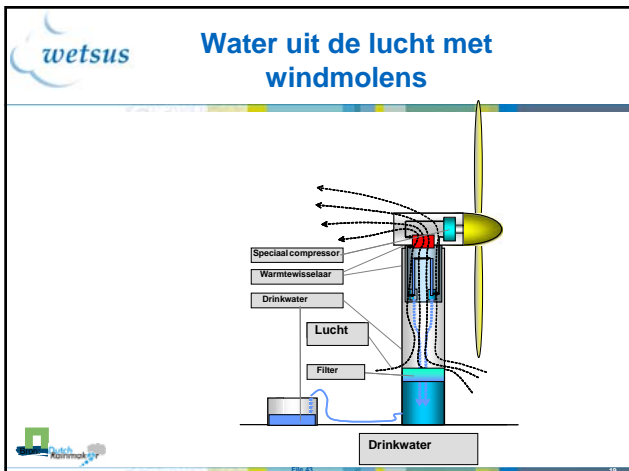
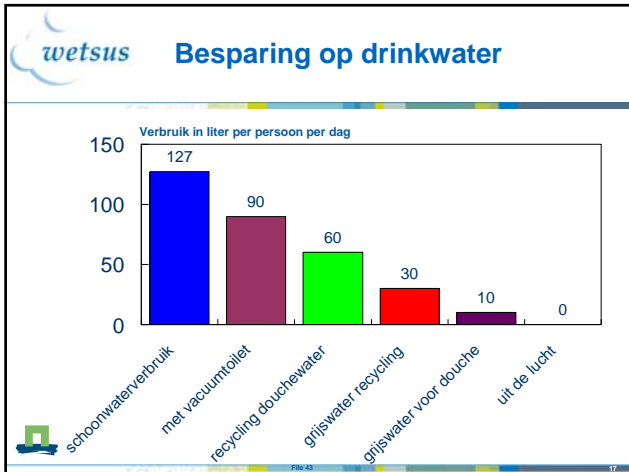


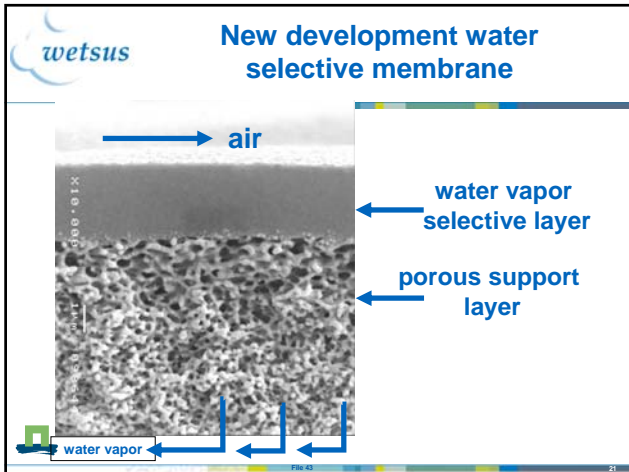


wetsus **Water use NL (litre/day)**

	NL
bath/shower	57.6
toilet	37.1
cloth/dish water	24
leaks	0
faucets	8.8
Total (l/d)	127.5

16



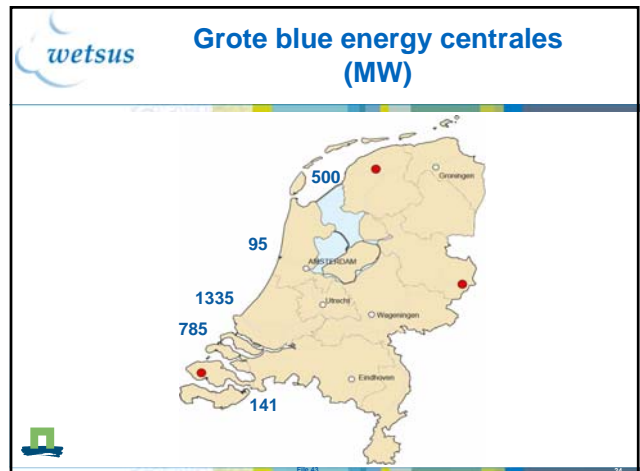


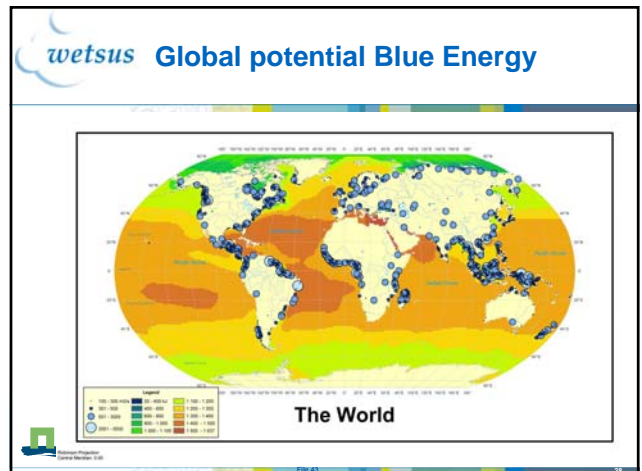
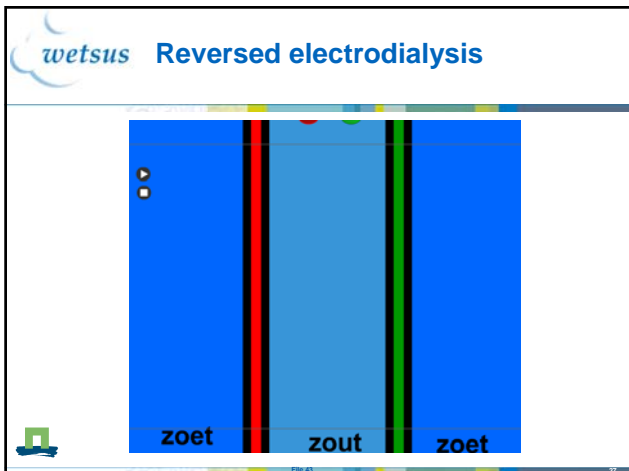
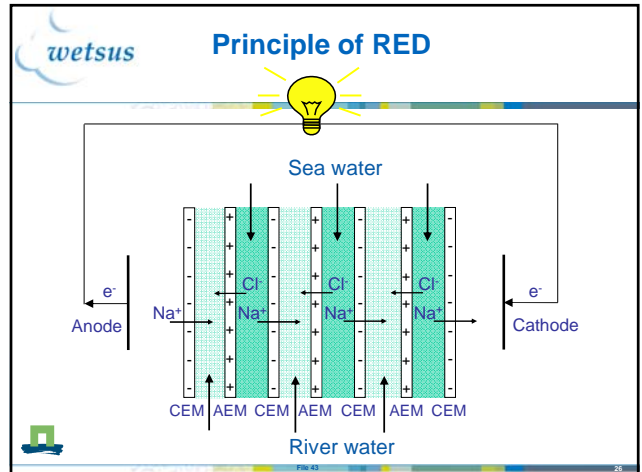
wetsus **Kosten water NL-gezin per jaar**

Drinkwater	€150
Rioolrecht	€125
Verontreinigingsheffing	€150
Totaal	€425/jaar

Fig 43 22

- wetsus **Besparing**
- Energie EUR 170/jaar
 - Afvalwater 60 m³ gas/jaar
 - Douche recycle 180 m³ gas/jaar
- Fig 43 23





wetsus **Up-scaling**

(mW) (20 W)

Fig 43 20

wetsus **Wetsalt Harlingen** wetsalt
research site
salt water technology

- Blue Energy en ontzilting
- Eigen subsidieregeling
- www.wetsalt.nl

Fig 43 30

wetsus **Wetsus academy
Int. Master Watertechnologie**

- WUR, RuG en UT
- Track in Biotechnology/Chemical engineering

www.wetsusacademy.nl

Fig 43 31