Sustainability issues in Water Supply and Sanitation Services in Europe

Spain Italy Netherlands

Germany, England, Belgium

and France

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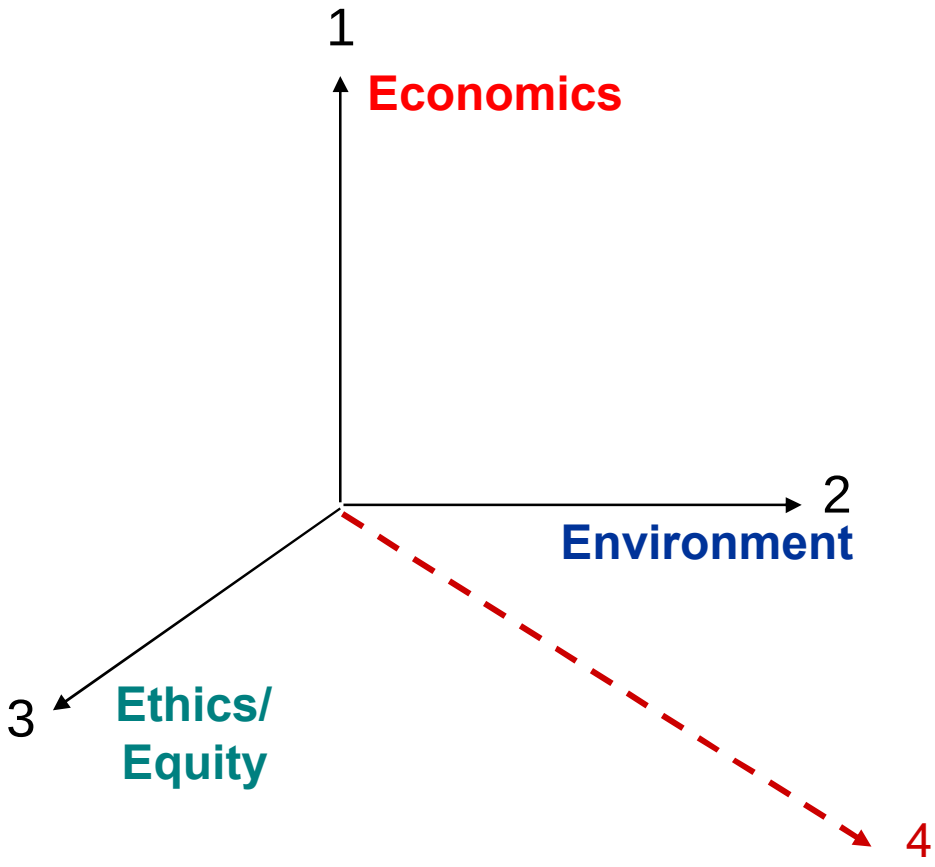
The 4 Dimensions of Sustainability in the EAU&3E Project



- 1 – Cost recovery including renewal of the infrastructure?
- 2 – How much more to meet sanitary and environmental standards? (EU directives, national policy, water conservation policies etc.)
- 3 - If 1 and 2 are met, is water price still socially acceptable ?
- 4 - And politically ? Here a 4th axis is needed on multi-level governance, and on new authority – operator – users relationships

El agua de Barcelona

Configuración del sistema hídrico en el entorno del área metropolitana de Barcelona

Barcelona

A Two-Tier supply system

- ATLL : Public regional bulk water company
- AGBAR : privare company, produces and supplies water to Barceloan + 17 suburban cities (buys 40% of its water to ATLL)
- The rest: small direct utilities and mixed companies

AGBAR also responsible for sanitation and stormwater

In a Mediterranean Regime …

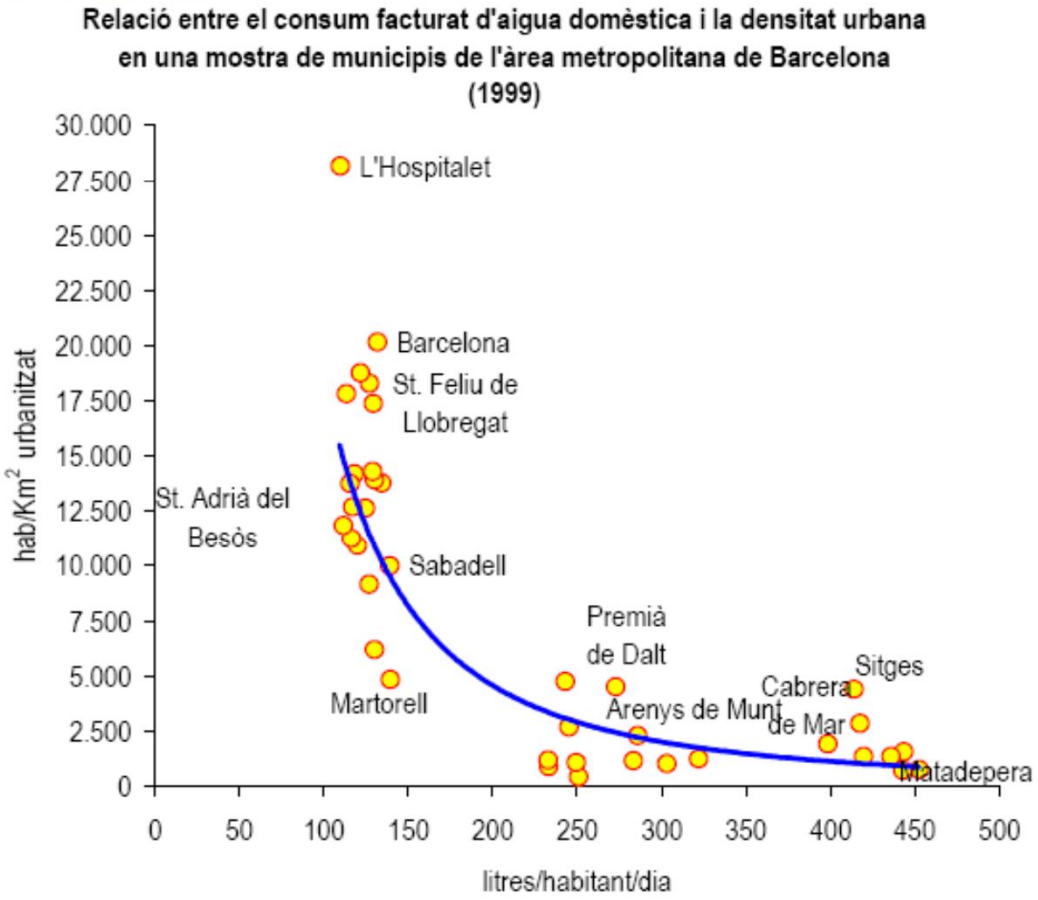

August 2006


February 2008

Important Suburban Growth

development inadapted to climate
Reverse link between density
And water consumption

Source : Rivera, Capellades, Sauri, 2001



Median demand in dense area: 130 lcd

Barcelona down to 109 lcd in 2010

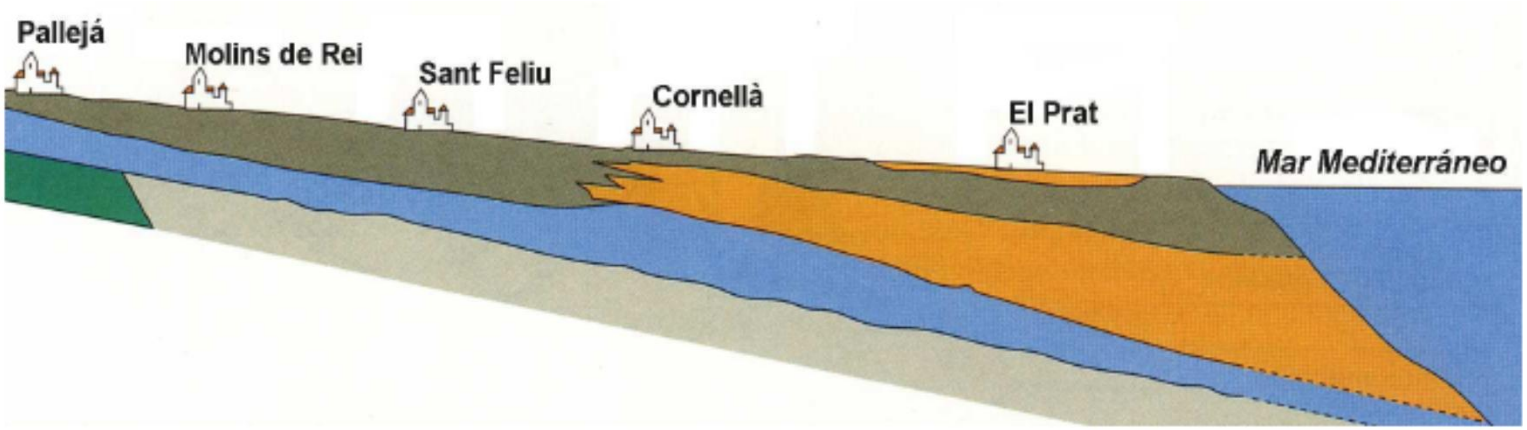
Median demand in suburbia : > 200 lcd, up to 500 lcd

Chosen option: new Infrastructure and Technology

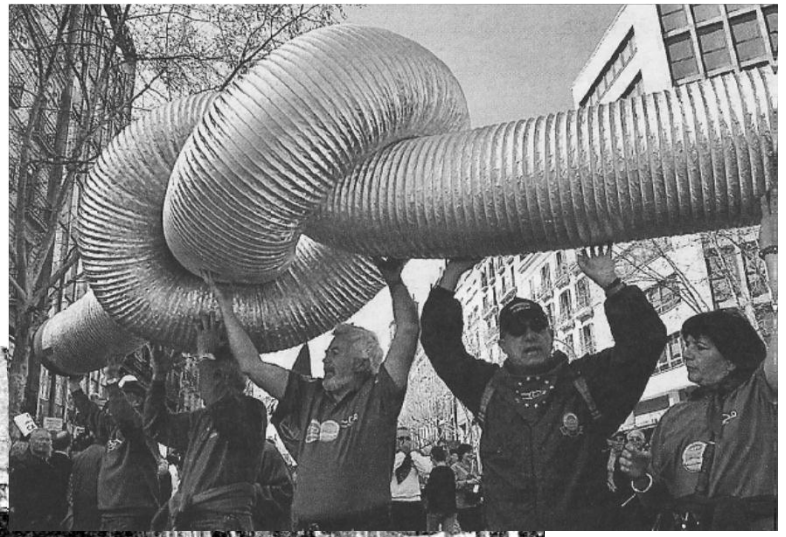
- In 1997, dream to transfer water from the Ebro or Rhone, but shelved
- In 2008, 100-yr drought : tankers from Tarragona and Marseilles, and new disputes; then it rained …
- In 2009, Desalination & WW reuse : High OPEX, relatively low CAPEX (compared with additional dams & transfers)

But also, Aquifer recharge

- Llobregat Delta aquifer: early case of integrated management with users participation
- Agbar develops the ‘conjunctive use’ surface – ground; both aquifer and river recharge



Prices, droughts, water wars



Against
The
transfers

And …

Against
more levies
And IBTs

Barcelona and sustainability

- The long tradition to transfer water from long distance and subsidize the service (civil engineering / quantity issue) is out
- Replaced by a problematique of quality (sanitary/chemical engineering) with sophisticated technology, implying little public participation, and no territorial conflicts
- The consumer equity issue plus social tariffs: dealt separately
- Control of the local aquifer needs to be extended

Italy : a Governance Reform, Galli Law (1994)

- Before: 14000 WSS management units for 8000 communes, uncomplete infrastructure (sewage works), EU Directives not met
- The reform: concentrate water and wastewater utilities together at supra-local (optimal) level, and price services closer to full cost
- While water resources are public, utilities cannot be kept under direct labour, must have commercial status, and are regulated with same formula as in UK (rpi + k – efficiency gains)
- After 10 years' debate, the concentration in the ATOs took place at the level of provinces, not catchments.

C.I.R.E.D.

The 91 ATO

Regione	n° ATO	n° Comuni	Popolazione
ABRUZZO	AB 1 - Aquilano	38	102.856
	AB 2 - Marsicano	36	191.896
	AB 3 - Peligno Alto Sangro	37	75.167
	AB 4 - Pescarese	64	439.009
	AB 5 - Teramano	61	294.478
	AB 6 - Chietino	62	270.634
BASILICATA	BA 1- Unico	131	610.300
CALABRIA	CL 1 - Cosentz	155	761.618
	CL 2 - Catanzaro	80	394.453
	CL 3 - Crotone	27	177.547
	CL 4 - Vibo Valentia	50	179.613
	CL 5 - Reggio Calabria	97	578.231
CAMPANIA	CA 1 - Alto Calore	195	732.513
	CA 2 - Napoli Volturno	136	2.821.649
	CA 3 - Sarnese Vesuviano	144	768.021
	CA 4 - Sele	76	1.454.025
EMILIA ROMAGNA	ER 1 - Piacenza	48	266.363
	ER 2 - Parma	47	362.018
	ER 3 - Reggio Emilia	45	419.865
	ER 4 - Modena	47	662.723
	ER 5 - Bologna	60	903.836
	ER 6 - Ferrara	26	365.341
	ER 7 - Ravenna	18	549.992
	ER 8 - Forlì/Cesena	30	350.158
	ER 9 - Rimini	20	295.159
FRIULI VENEZIA GIULIA	FV 1	61	377.379
	FV 2	136	520.444
	FV 3	25	158.119
	FV 4	9	291.826
LAZIO	LA 1 - Nord	61	788.631
	LA 2 - Centrale RM	111	3.868.097
	LA 3 - Centrale RI	81	173.039
	LA 4 - Meridionale LT	38	568.292
	LA 5 - Meridionale FR	86	478.803
LIGURIA	LI 1 - Spezzino	32	225.285
	LI 2 - Genovese	67	933.127
	LI 3 - Savonese	69	285.105
	LI 4 - Imperiese	67	216.996
LOMBARDIA	LO 1 - Bergamo	244	968.723
	LO 2 - Brescia	206	1.106.375
	LO 3 - Lecco	60	311.122
	LO 4 - Cremona	115	334.037
	LO 5 - Como	163	537.046
	LO 6 - Lodi	62	185.474
	LO 7 - Mantova	70	375.159
	LO 8 - Pavia	190	488.791
	LO 9 - Sondrio	78	176.565
	LO 10 - Varese	141	816.906
	LO 11 - Provincia di Milano	186	2.312.557
	LO 12 - Milano	1	1.301.551

Regione	n° ATO	n° Comuni	Popolazione
MARCHE	MA 1 - Marche nord	67	340.830
	MA 2 - Marche centro AN	45	381.982
	MA 3 - Marche centro MC	46	326.991
	MA 4 - Marche sud Alto Pesaro	27	113.858
	MA 5 - Marche sud AP	59	287.824
MOLISE	MO 1 - Unico	136	331.446
PIEMONTE	PI 1 - Verbano	165	592.669
	PI 2 - Biellese	185	446.477
	PI 3 - Torinese	309	2.208.726
	PI 4 - Cuneese	169	664.349
	PI 5 - Astigiano	156	296.496
	PI 6 - Alessandrino	147	322.792
PUGLIA	PU 1 - Unico	258	4.082.935
SARDEGNA	SA 1 - Unico	377	1.660.701
SICILIA	SI 1 - Palermo	82	1.240.262
	SI 2 - Messina	108	653.315
	SI 3 - Trapani	24	434.055
	SI 4 - Enna	20	186.145
	SI 5 - Catania	58	1.088.323
	SI 6 - Agrigento/Caltanissetta	62	756.665
	SI 7 - Siracusa/Ragusa	33	783.944
TOSCANA	TO 1 - Toscana nord	72	631.487
	TO 2 - Basso Valdarno	62	766.179
	TO 3 - Medio Valdarno	69	1.187.369
	TO 4 - Alto Valdarno	37	297.497
	TO 5 - Toscana Costa	34	370.612
	TO 6 - Ombrone	62	364.369
UMBRIA	UM 1 - Perugia	36	492.577
	UM 2 - Terni	32	221.317
	UM 3 - Foligno	22	162.006
VALLE D'AOSTA	VA 1 - Unico	1	119.356
VENETO	VE 1	69	206.959
	VE 2	115	897.939
	VE 3	24	661.953
	VE 4	53	269.129
	VE 5	95	798.129
	VE 6	145	1.049.828
	VE 7	72	473.301
	VE 8	10	50.655

A too ambitious reform?

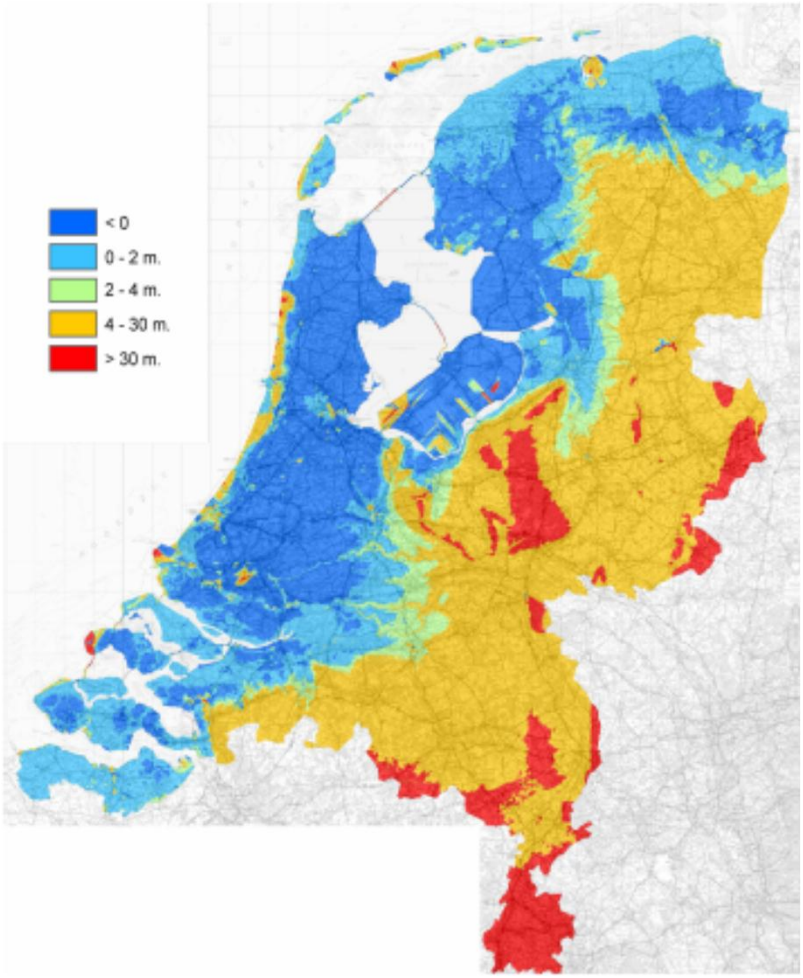
- Strong tradition of autonomous municipalities and weak State
- It is the relationship between local authorities and utilities which is regulated, not private companies like in England
- large delays in the designation of operators and in investments
- For investors, risks poorly spread, information asymmetry, complexity of regulation … Not very attractive
- The reform advantages the traditional municipal enterprises of cities (the Aziende)
- There are indeed efficient water utilities (e.g. Torino, Milano, Bologna)

Sustainable failure?

- Behind schedule for WFD and other Directives' implementation
- Focus on catching up with collective systems, while decentralised systems would be better solution (e.g. France's septic tanks)
- Implementing the law implies to treble the price of water! Politically impossible
- November 2009 law: County (ATO) authorities compelled to tender within 2 years for the operator's choice: might push a privatisation of the water sector
- Mediatic-populist reply (Aqua Publica Europea): organise a national referendum to stop all reform and impose public water services management

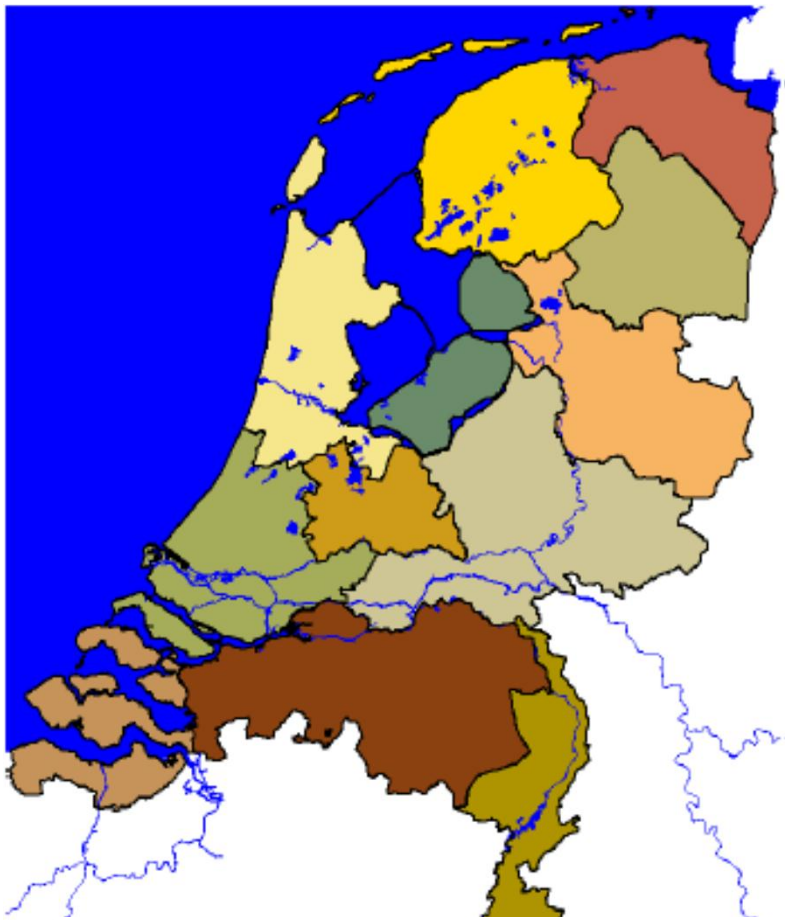
- Lesson: water price reforms are slow ones …

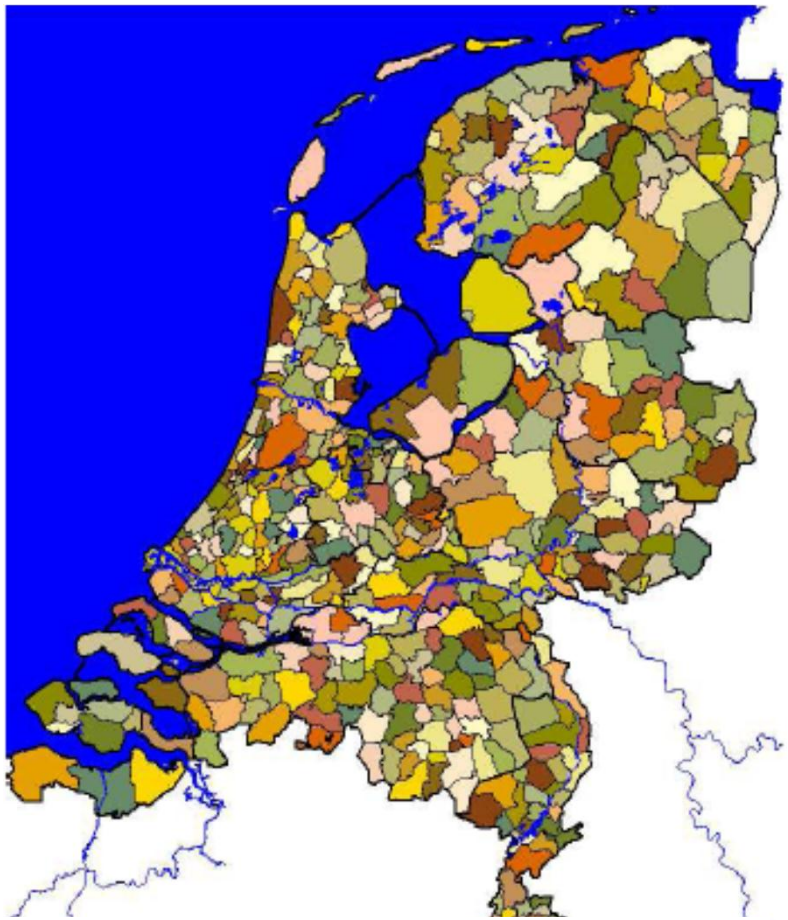
Netherlands



- Half of country and 2/3 population below high tide level
- Very ancient local water institutions
- A strong tradition of subsidiarity and multi-level governance
- But water wastewater and sewage works separate policies

Decentralised water management





12 provinces (water resources planning)

441 municipalities (sewers)

Waterschappen & waterleidingbedrijven:

Voluntary concentration, complex governance

26 waterboards (user-based) : payment per family

10 water supply companies (publicly owned): payment by meters

Transforming ‘no-alternative’ into sustainability





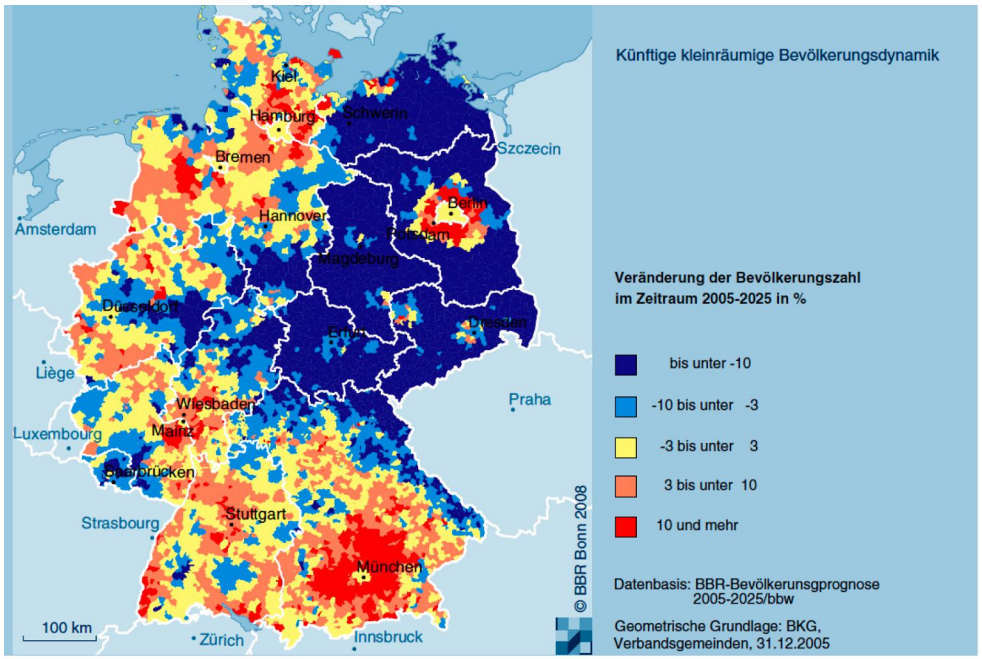
- Subsidiary governance & mixed payment schemes -> good cost recovery (internal cross-subsidization)
- Waterboards resisted projects to merge them with water companies
- Ecology-minded society now: give more space to water + decentralised schemes (water reuse)
- Sanitation paid through taxes: a form of social tariff? Split water charges better accepted.

… But growing pressure of globalisation and climate change and sea level issue

Germany: a dramatic fore-runner?

Demographic Change

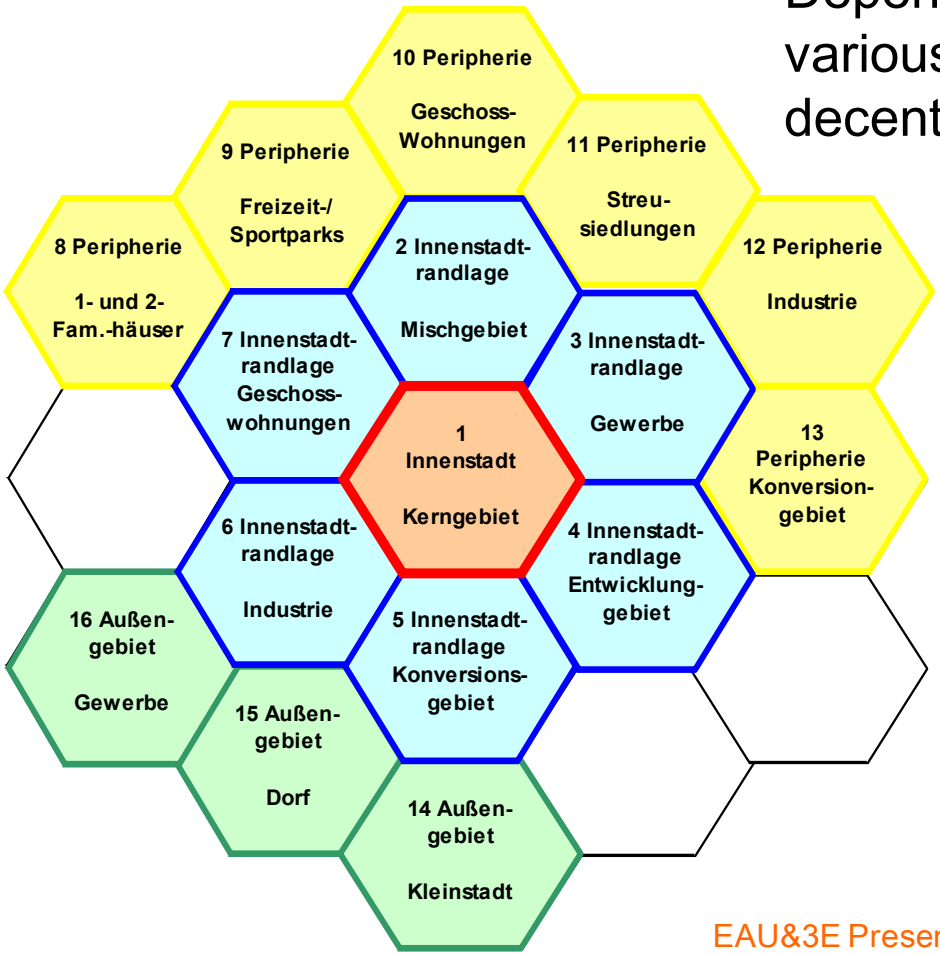
Population dynamics at a small scale



‘Stadtwerke’ facing Sustainable development

- German tradition is to integrate public services (water-gas-electricity-district heating-public transport) in municipal enterprises: stimulate local economy, resist Prussian control
- Growing evolution towards formal privatization and partial integration at regional scale (concentration): *impenetrable*?
- Presently allows to face serious financing issues due to consumption collapse: Typically in new Eastern Länder
- Oversized systems push some urban ecologists to propose a radical shift combining reduced public services and decentral systems. Diwn to 45 lcd …Paradox??

Model City „netWORKS“



Depending on urban density, experiment various innovations in decentral. Or semi-decentral systems.

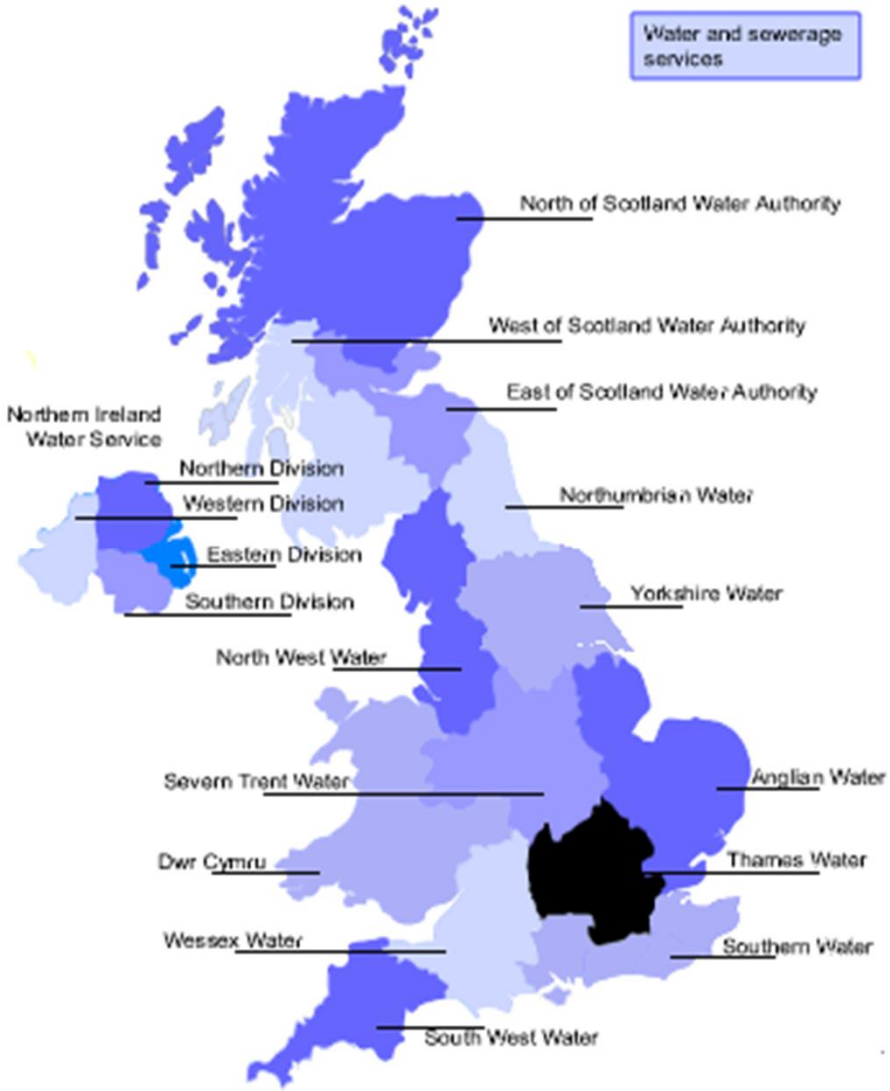
Neighbourhood level projects (e.g. IBA Hamburg) + assessment models comparing central. vs decentral.

Material and energy balances,

(indirect consideration of climate change), costs/recipes ...

Social dimension mentioned, but no tariff/charges impact study yet

England - Wales



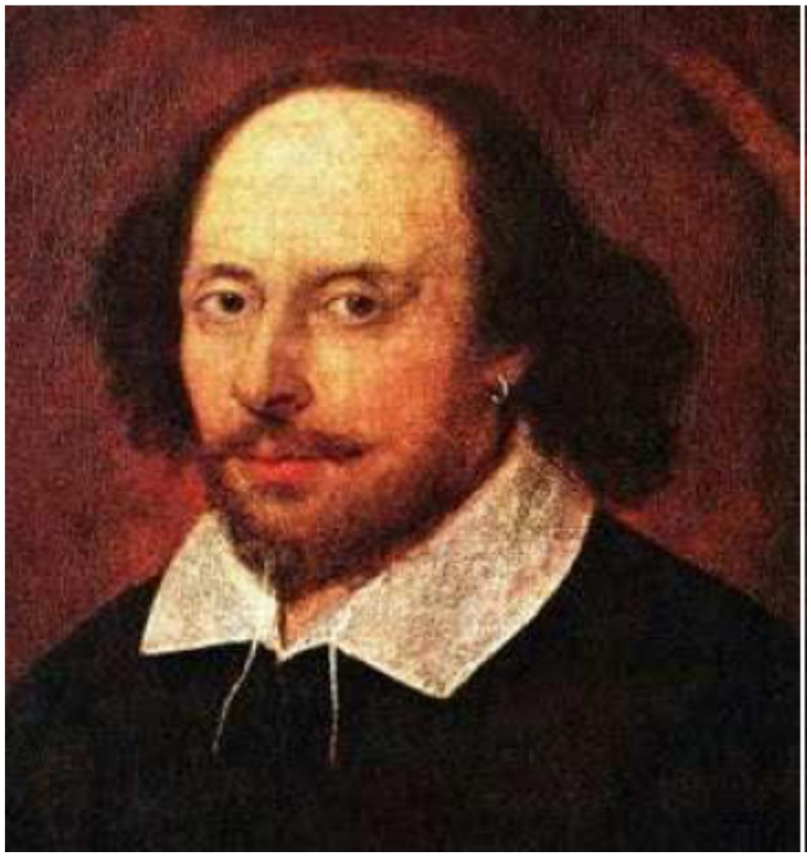
Privatisation created a peculiar situation of confrontation between companies and customers (bills in arrears up)

Despite investments in leaks control, still companies must face growing Scarcity in the South East.

Encourage cutsomers to conserve, thru Refurbishing/harvesting-> *Waterwise UK*

But companies complain: no bonus from OFWAT while they lose money …

A continuing metering issue ...



- To meter or not to meter? Very high initial cost (£1.4 bn in 1990)
- Private companies would like to universalize metering and push water conservation in homes,
- But they want their recipes to stay the same, and to improve trust with customers
- Today more than 25% customers have above 6 months' overdues; UK first country to study the 'water poor' issue

Belgium

- Water services in municipal hands, with unfinished sewage collection & treatment. New context of full cost pricing (WFD art. 9, taken seriously)
- Public water supplies concentrate quickly and sewerage is now regionalised, to compensate price impacts thru cross-subsidies
- Various (2-part) tariff structures with IBTs, not for conservation but for social reasons. Results are disappointing in Flanders
- Water companies fear spiraling down effect: large industrial customers quit, but they drill wells. So do residents with rainwater harvesting => consumption goes down (mean 91 lcd), prices go up (40% in 5 years – should continue), socially unacceptable ...

… and France?

- The most heterogeneous situation, with very tiny and very large utilities (more than 10000 for water supply alone, Paris 2.2 million; 900 000 km of water mains, more than 17000 sewage works)

- Difference with the US: revolving fund is our *Agences de l'eau*, which get their money from water bills (16% of total, sewerage incl.); metering widespread, but one bill per property (submetering in half of condominiums)

- Finishing water pollution control from cities while pipe renewal was increasingly needed => average prices double 1991-2004

- Water policy became a hot issue: water consumption down, prices up, a few corruption affairs, water a planetary issue, diffuse pollution from agriculture … We need tools to address the global picture !

Conclusion

- In most European countries, concentration/centralisation of water utilities at supra-local level is taking place, but not really evaluated in the 4 dimensions of sustainability.
- Many software tools available to support long term infrastructure management, but use limited by lack of prioritization
- Few foresight tools for future water demands, while coupling with asset management might lead to partly re-design water systems
- A few models take other criteria than money into account (carbon; materials, energy …)
- The social sustainability dimension is still in infancy.