BaumannMontreal2008 – 'how many organizations does it take to change a lightbulb?...' (OHotext)

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61 PUBLICATIONS **736** CITATIONS

Simple material relations handled by

complicated organisation, or

"how many (organisations) does it take to

change a light bulb?"

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'Organising for the environment'

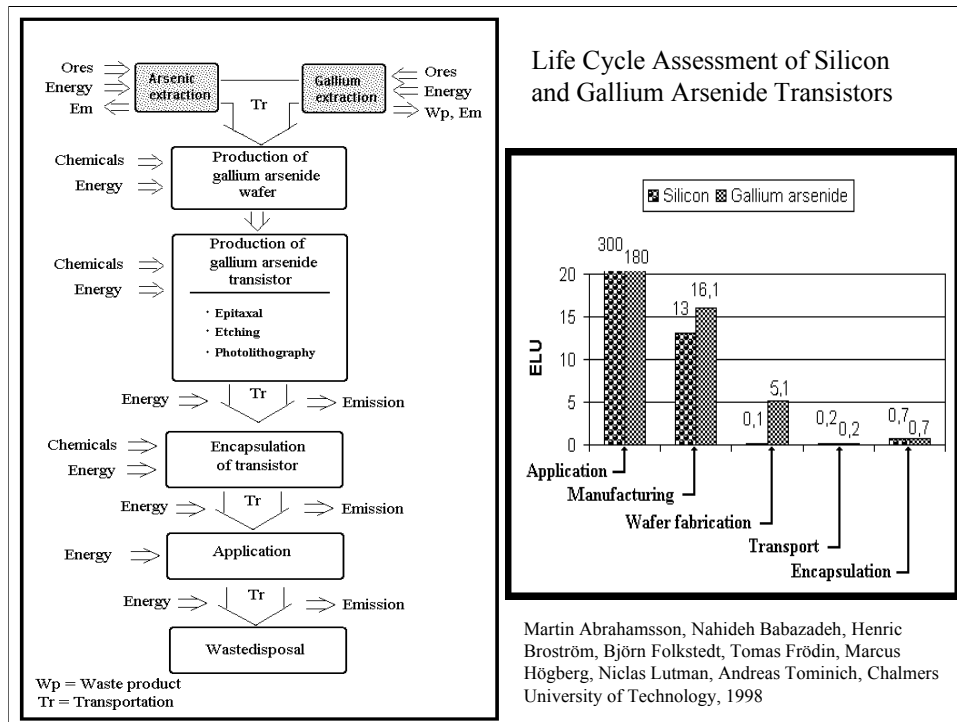I shall begin by presenting myself. I'm an environmental engineer at my 1st organisational conference.

Although I am an engineer by training, that's not the whole story. I'm also interested in 'organisation', more specifically: the organisation of environmental problems, or an organisation for the environment.

Engineering is an applied science: we usually apply basic natural sciences to develop an understanding of how practical technical problems can be solved, among them 'environmental problems'. However, environmental problems are more than just technical problems.They are social and organisationl too! This has led engineering scholars to look for social/organisational theories they can apply to problem solving. I'm onw of them, in a way…

For more than 15 years I have searched the social sciences without finding exactly what I want: theories are too people-oriented (if I may say) and there's too little physical stuff/objects in them. So when I saw the announcement for this conference, combining Organisation and Materiality, I had to come here and see.

(In the paper, I report my social literature search. The conclusion is, in short, that the biophysical environment is missing in most environmental social science work - there are some exceptions though, but generally it's mostly about attitudes, perception, learning, controversies, etc.)

If I cannot find any satisfactory theories, then let's try to do some combined enviro-/organisational studies and see what we can learn, I thought, and some years ago I initiated a couple of PhD projects, and later I collected some like-minded people in a small research programme "Organisation for the Environment". What I present here are learnings I made from comparing the projects in this programme.

Life Cycle Assessment of Silicon and Gallium Arsenide Transistors

Martin Abrahamsson, Nahideh Babazadeh, Henric Broström, Björn Folkstedt, Tomas Frödin, Marcus Högberg, Niclas Lutman, Andreas Tominich, Chalmers University of Technology, 1998

Just to give some environmental engineering background…

A common type of environmental studies engineers do involves the tracing of material flows related to, for example, a product.

The product here is an electronic device, a transistor. All flows from raw materials to waste management are included. Then the (total) environmental impact is calculated for the whole system (amounts of pollutants emitted, resources used, etc) and one can then see what parts of the system that has the greatest impact on the environment and where change is needed.

Engineers like to think that by (simply) presenting compelling results, things will change. Alas, it's not so simple. Environmental change doesn't happen on its own, so we need to learn about actors and their relationships involved in this system.

As you see, organisations are not part of this picture (only technical processes) even if there's a whole string of them along the material flow.

CO$_2$ emissions of Scott Paper's pulp suppliers

(ENDS report 1992)
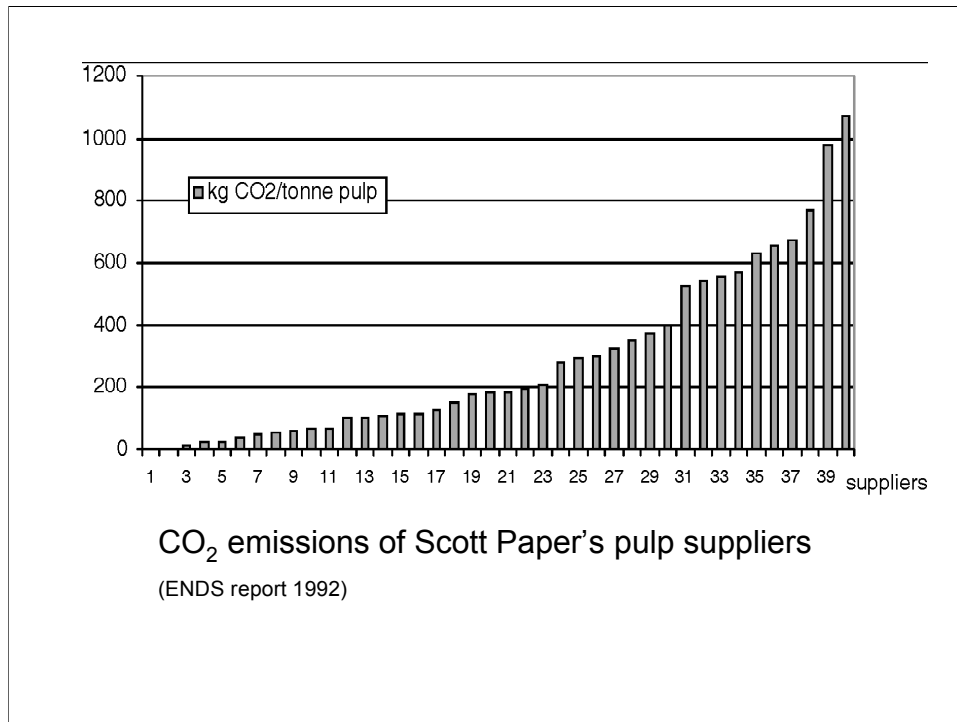
Just an example to show how much organisation can influence environmental performance.

To produce tissue paper, Scott Paper gets pulp from 40 suppliers, here ranked with regard to the amount of CO2 emissions per tonne pulp in respective supplier's pulp production.

All these suppliers deliver the same type of pulp for paper tissue.As an engineer, I know that there are not that many ways to produce pulp, so there's got to be other, more organisational reasons to the differing levels of CO2 emissions.

Most engineers, however, treat this as a data quality issue - what is a good average for CO2 emissions for pulp production that can be used in the material flow calculations…

Enviro/organisational studies

Socio-material interactions

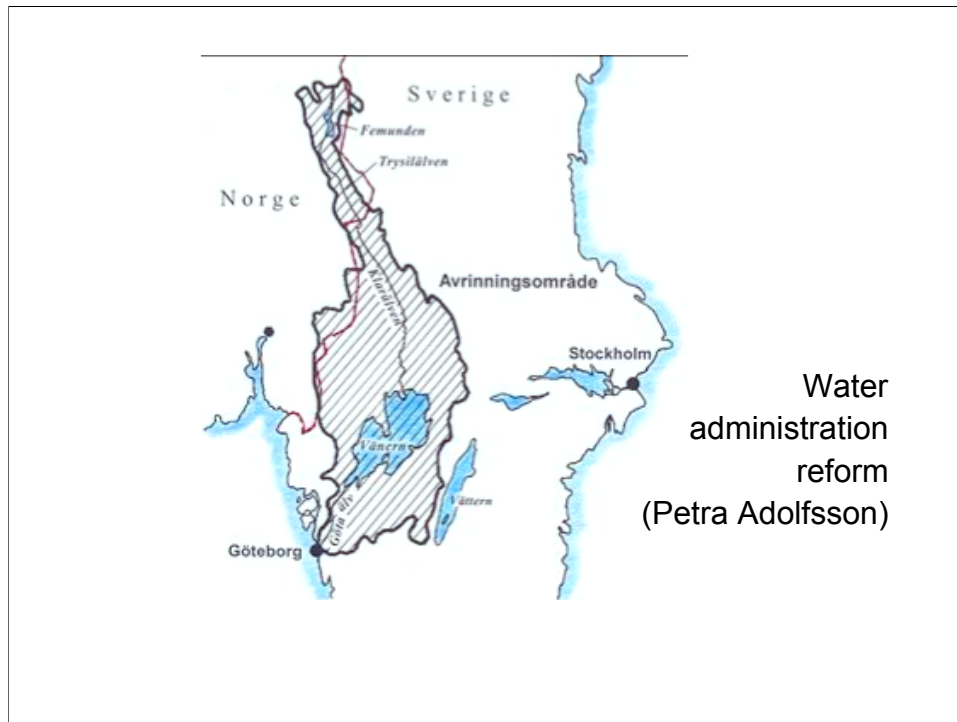| **Environment acting on organisation**	**Organisation acting on the environment**
- Water administration reform study	- Studies of property management (residential & commercial properties)

So basically, we take these material flow studies and add organisational studies to them, but in oue enviro-/organisational studies, we haven't studied the whole material flow system and all its organisations - it would be too much to start with! Instead, we take a part of such a system and focus on what happens in the interface between people and objects, in the context of these material flows and the organising.

'Socio-material interaction' is a term we've come to use for this. 'Socio-material' rather than 'socio-technical', because nature is not technical. 'Interaction' because it can go two-ways: there are projects on the environment acting on organising (the case of the reform of water administration) and organisations acting on the environment (studies of residential and commercial property management).

A lot could be said about each of these projects, but I'll only flick through them here, landing on a couple of aspects and situations that I'll say some more about.
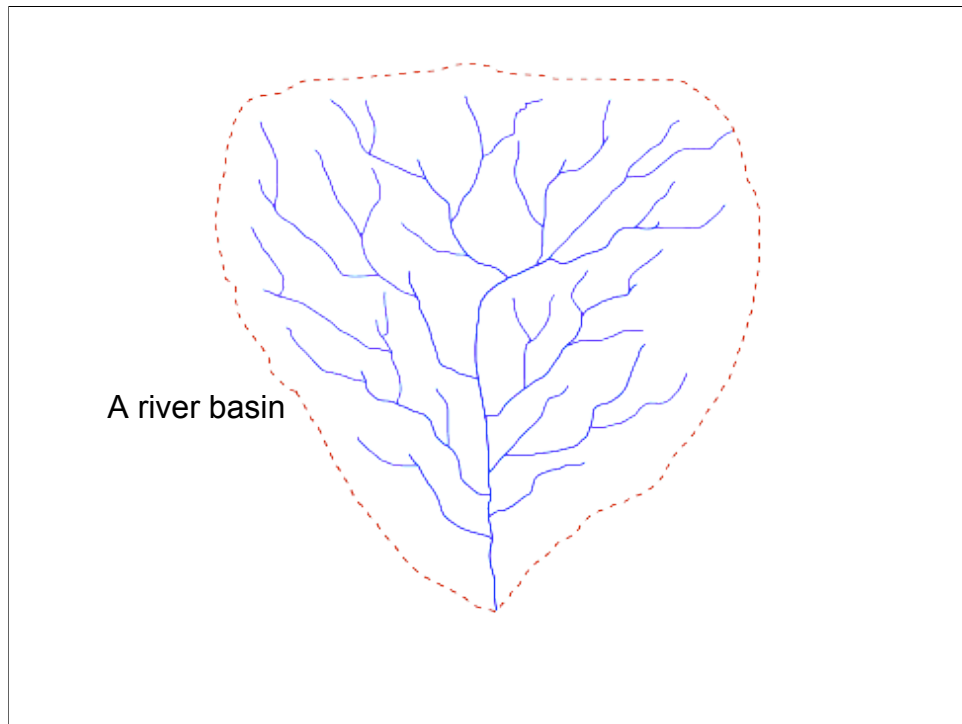
A river basin

This is a river basin - the whole drainage area that feeds the streams and rivers to an estuary. This is supposed to be the organising principle for the reform of water administration in Sweden, and it should replace the traditional administrative boundaries of municipalities and counties.

But this image is too tidy!

Sverige

Femunden

Trysilälven

Norge

Avrinningsområde

Klarälven

Stockholm

Vänern

Göta älv

Vättern

Göteborg

Water administration reform
(Petra Adolfsson)

Here is the river basin from where I live. I actually extends up into Norway. Maybe you can imagine some of the difficulties of the reform.

Petra Adolfsson studies this kind of reform for 2 river basins in Sweden. Among many other things, to get these reforms to work, it seems that maps, meetings, statistics and reports are not sufficient, and that they've had to go out actually see the waters. In different ways, they've come to arrange some kind of guided tours to the waters for the involved parties in the 2 river basins she studies. She even goes as far to say that such guided tours have saved to reform, at least in one case.

Residential property mgt
(Birgit Brunklaus)

These are county governor buildings, a typical building type for my hometown: 1st story stone, 2 stories in wood. Birgit Brunklaus has studied 4 such properties just around the corner from these: one tenant-owned, one owned by a municipal company and two by different private property companies.

In her study she documented the technical standard of the buildings, environmentally relevant statistics (such as energy and water use over the years; time and type of renovation) as well as the organisational history (especially for building operations and maintenance).

It is clear that these buildings, technically similar, have very different environmental performances. It can differ as much as 50%. I'll try to explain how this is possible.
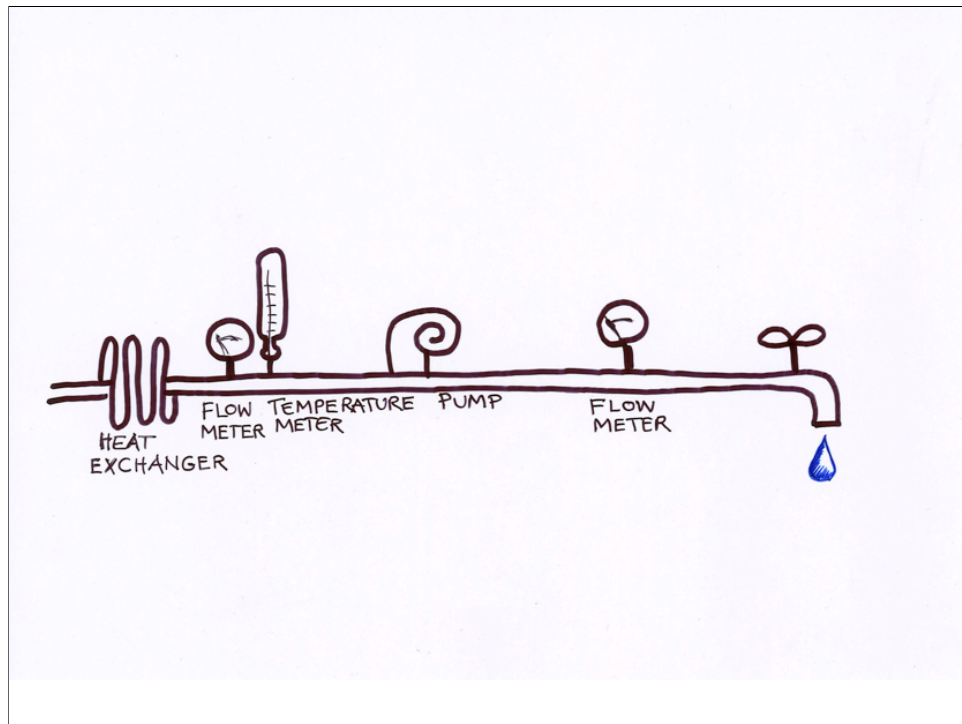
Here is a water pipe. There is the heat exchanger to make the water hot (the heat comes from the district heating supplier); the temperature is measured; then, the water is pumped up to reach the top floor in the buildings; the volumes for the building is measured; and there is the tap.
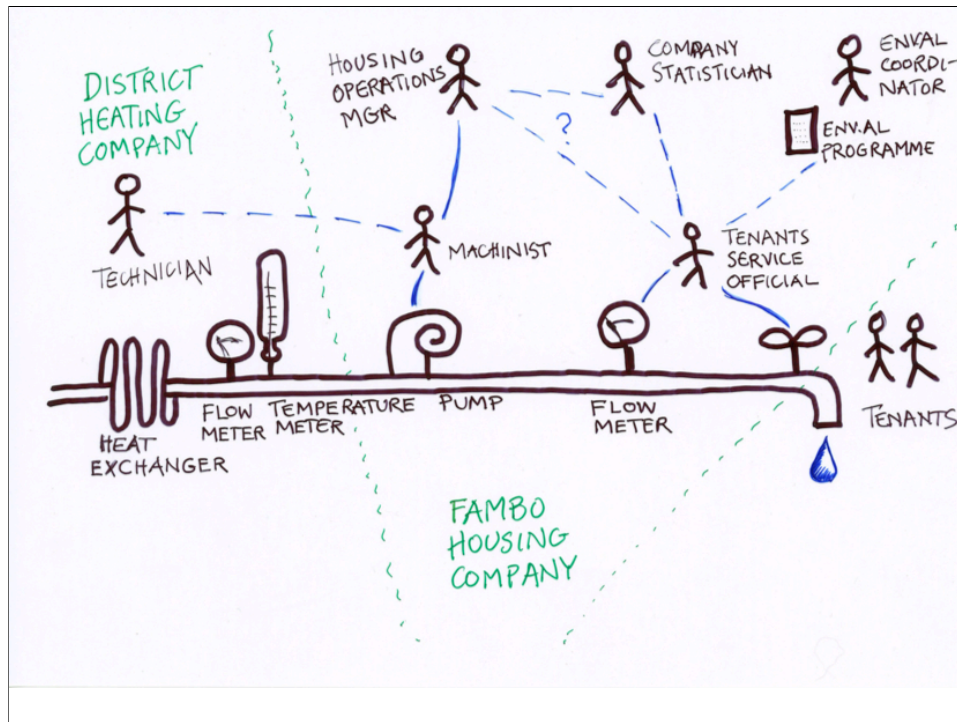
Looking at the organisation along the pipe, we see the following: The district heating company has a technician that comes every now and then to check on the heat exchanger and to read the measurements. He is let into the building by the property company's machinist. The machinist, in turn, is in charge of the pump in the buildings of his district (>5000 apartments) - a big district. They do other jobs too, heating and ventilation and such. This company stopped having janitors some 15 years ago - they were replaced by these machinists together with what is called 'tenants' service officials'. (This change was introduced so they could have a customer-oriented business - the CEO came previously from hotel manage-ment. As a result of customer-orientation, more gardening was introduced.)

The tenants' service officials have offices in the apartment buildings and don't serve more than 300 tenants. When it comes to water, they do little jobs, fix a leaking tap, read the volumes and send the numbers to the company statistician
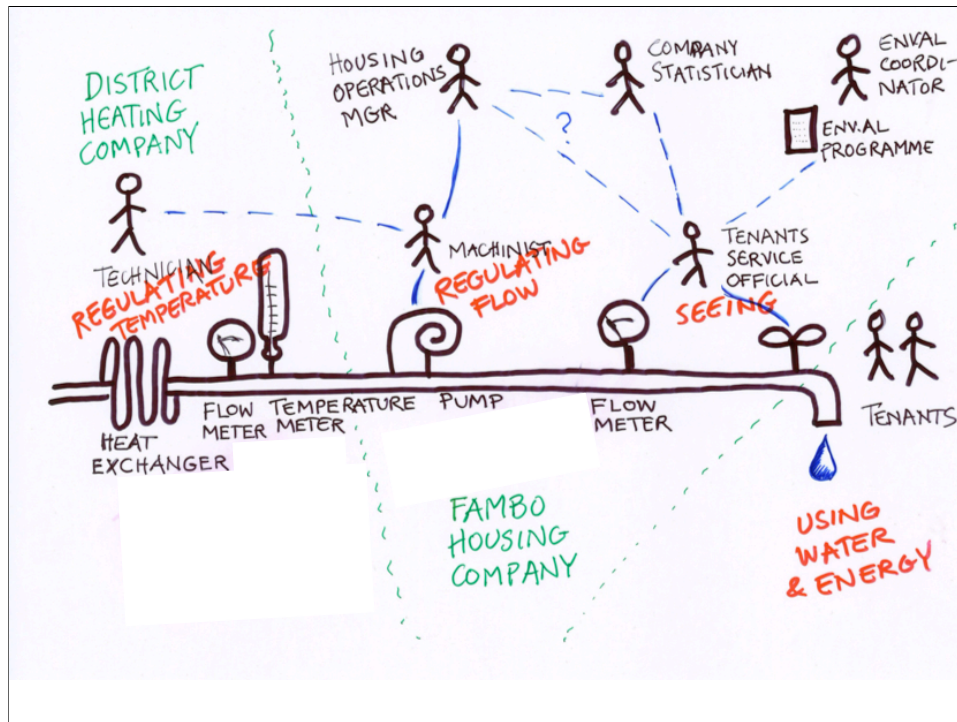
So, to regulate consumption of heated water, there is a need for coordinating inter-action points, the using, the seeing, the regulating; the volumes of water via pumps and pressures; the energy via water temperature, the state of insulation along the pipe and the state of taps. The trouble is that interaction points are poorly connected in this case.

The machinist and the service official belong to different parts of the organisationn (technical and customer organisations, respectively). There can be some contact via the operations managerbut unclear how. The district heating company, then, is sepa-rate. And the environmental coordinator, nor the environmental programme, has any stron presence here.

In the other studied properties, there is one person to do this and this - this, that (interactions) and the tenants are more involved, …
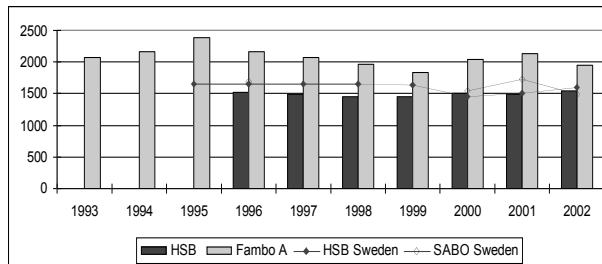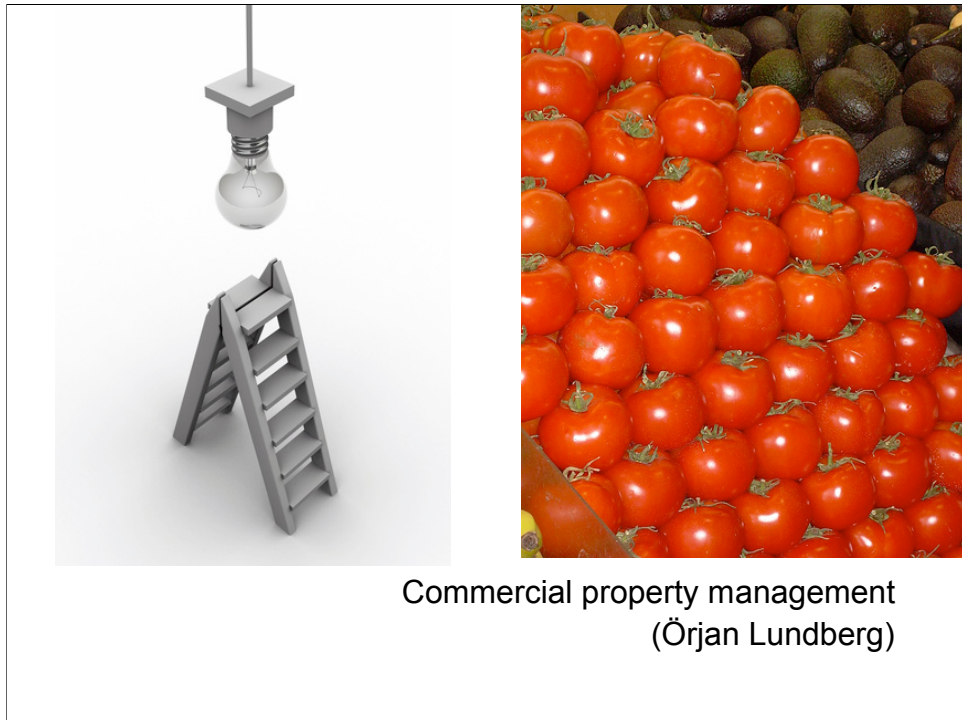
Water use
(litres / m² yr)
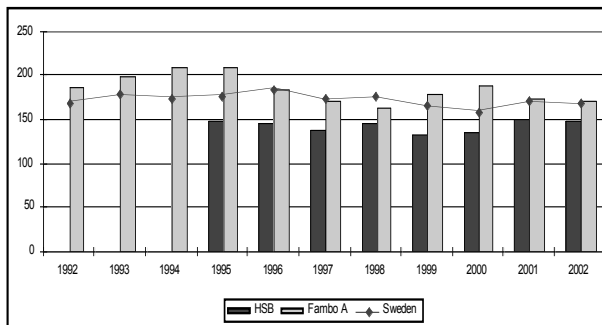
Energy use
(kWh / m² yr)

… and their consumption levels are lower. The irony is that Fambo, the company studied here, marketed themselve as the expert of county governor buildings.

Commercial property management
(Örjan Lundberg)

And now over to lightbulbs! The lightbulbs in question are found in one of the 2 retail stores studied by Örjan Lundberg. The 2 stores belong to the same reatil chain (ICA), but the shop buildings have different owners: one is owned by the retailers own property company (ICA Properties); the other by a pension fund. More specifically, the lightbulbs in question are those above the tomatoes in the ICA Property-owned shop building (and not in the other for some reason).

Not long ago, there were more ordinary lightbulbs there, but ICA Properties investigated the effect of different wavelengths on the presentation of goods, and then introduced different special and stronger lightbulbs for different parts of the store. These special lights make any bleak tomato look beautfully red, and have also markedly led to increase in tomato sales.

For some reasons, the special lightbulbss break more often. So when the light breaks, it gets noted by the shopfloor people.. Someone then reports it to the shop manager (who is reponsible for the building on the tenant side). ICA Properties have outsourced the operations of buildings to a service management firm and provided the shop keeper with the telephone number to the service provider's call center, where jobs get listed and prioritised. However, the shop keeper calls the 2 guys for his disstrict directly on their cell phone and they come with new lightbulbs.

Almost everybody is happy with this: greater tomato sales, more service jobs, helpful property owner, etc… everybody except perhaps the environment. These lightbulbs are questionnable from an environmental perspective: they come with a greater environmental impact from increased energy use (from the lightbulbs) and many types of environmental impacts from agriculture for the increased tomato sales.

Anyway, the short answer is that it only takes 2 organisations (4 people) to change a lightbulb. The longer version, involving the testing of lights, etc takes more people and organisations. The irony is that this particular shop is in the process of getting an environmental certificate as a 'green store'.

Cigarette butt organisation

Organisational boundary
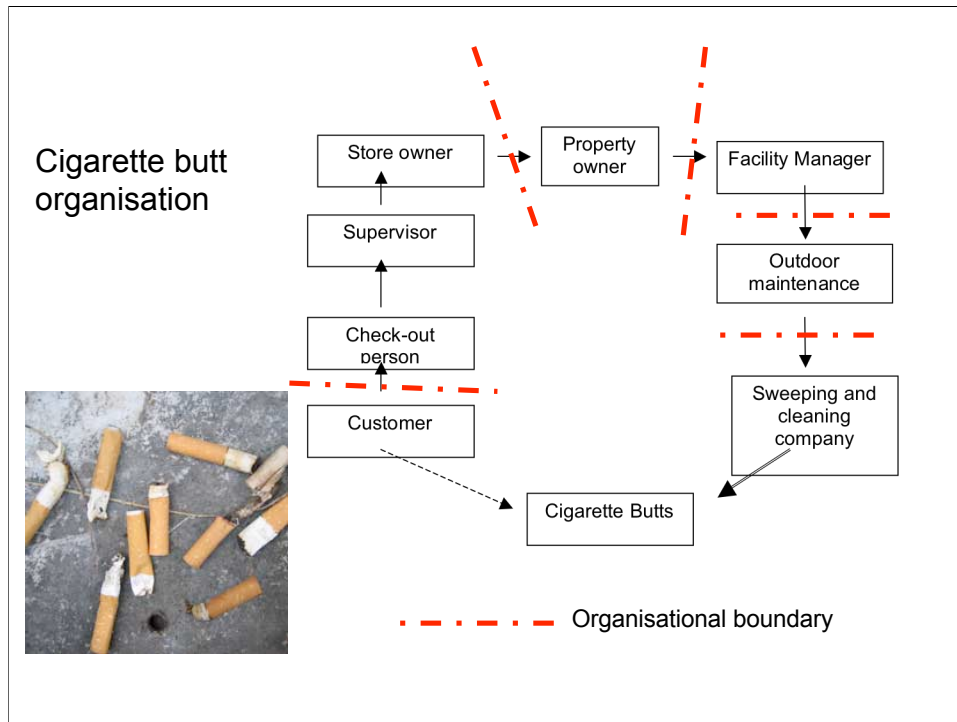
Two organisations is nothing in comparison to the number it takes to see and pick up the cigarette butts outside the store entrance. It goes like this:

A customer complains to the person at the checkout; who in turn tells the shift manager; who passes it on to the shop manager; who contacts the property owner (the pension fund's property branch, in this case) to complain about the lack of service. The property owner turns to their contracted facility manager, who has outsourced the outdoor upkeep to another company; then it shows that this firm has let the sweeping of the grounds to yet another company. Eventually…
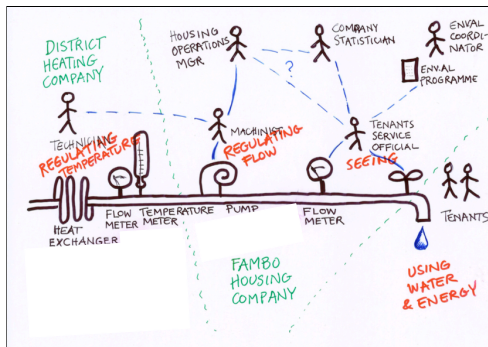
Cigarette butt organisation

…this guy comes.

So it takes at least 9 people in 5 organisations to pick up the cigarette butts. The shop manager is annoyed, because this action net rarely works, and he or someone of his staff has to personally pick up the cigarette butts.

District Heating Company

Housing Operations Mgr

Company Statistician

Env.al Coordinator

Env.al Programme

Technician

Regulating Temperature

Machinist

Regulating Flow

Tenants Service Official

Seeing

Tenants

Heat Exchanger

Flow Meter

Temperature Meter

Pump

Flow Meter

Fambo Housing Company

Using Water & Energy

Organisation
of e.g. water supply
= many organisations

Socio-material interactions:

- Consuming

- Measuring

- Regulating

Visitations ?

Organisational < > material relation

When trying to see (or even to just talk about) the parallels between these projects, I noticed a need to re-think some terms and have come up with some new ones to better understand the organisational and environmental relationships.

So what is (an) organisation? Here, for example, the how water supply organisation consists of many organisations. This understanding of organisation builds on Czarniawska's idea of 'action nets'.

Socio-material interaction is a term we've come to use to emphasize the material's role. Maybe we could get along with 'boundary object' (from ANT terminology) but we need to distinguish different types of interactions with the object (consuming; measuring; regualting).

This allows us to compare organisational and material relationships between two interactions points. In many cases, the organisational action net/chain is much more complicated than the material relation between two points, the organisation of cigarette butt sweeping being an extreme example.

I'm not able to say much about environmental solutions, but it seems that 'visitations' ("doing the rounds") have an important role. I think the guided tours of the river basins and the way janitors work in some of the studied residential buildings are good examples of this. When organisational connection between interaction points on the water pipe was poor, we also had the greatest consumption of water and energy.

What these terms do for you, I don't know, but they are a start for us, for our theoretical understanding of how we keep on polluting, but for sure, there's more work that needs to be done…!

Thank you for listening. And nonw, any questions or comments??