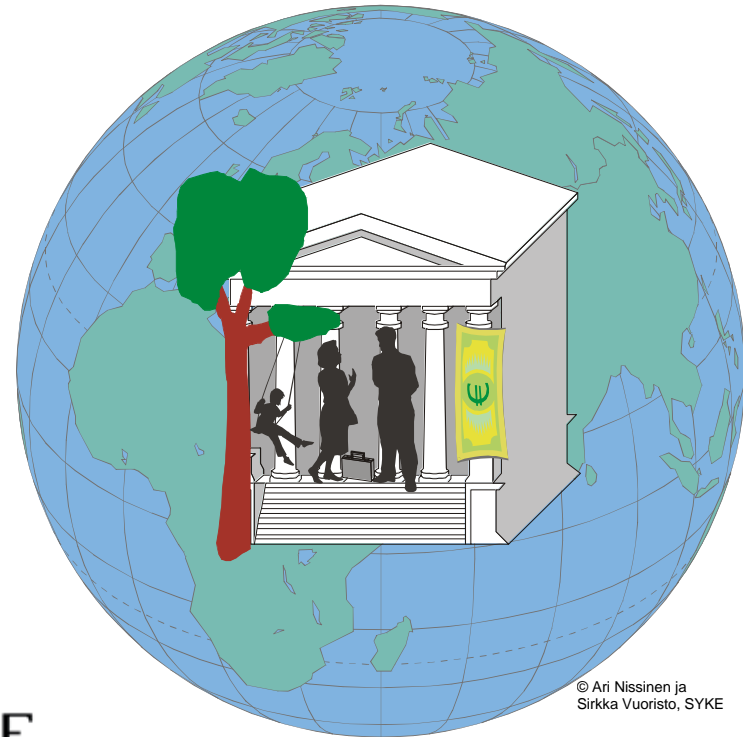


USER-DRIVEN INNOVATIONS TO DECREASE CLIMATE IMPACTS – FINNISH PROCUREMENT CASES

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Ari Nissinen, Maija Mattinen, Katriina Alhola
Finnish Environment Institute (SYKE)
ari.nissinen@ymparisto.fi



Contents

Background

Material and methods

Finnish innovative public procurement cases

Special case: design competition of Synergia building

- competence of design teams

- both 'strict' and 'guiding' aims and criteria

Conclusions

Background /1

Decrease greenhouse gas emissions 80–90% by 2050 -> great changes needed in products and services

Public sector is a significant buyer of goods, services, and work - e.g. in the European Union, 17-19% of gross domestic product

Green public procurement (GPP) - important policy instrument

Background /2

Decision of Finnish government about sustainable public procurement (8 April 2009)

- goals for 6 broad product groups, like buildings and transport

EU environmental criteria for public procurement (19 product groups)

European Directive 2010/31/EU of 19 May 2010 on the energy performance of buildings:

'nearly zero-energy buildings'

Background /3

Innovative public procurement has raised interest
- both innovation policy and procurement policy

The aim is to find a new kind of solution (i.e., innovation)
to meet the needs the public organization expresses

In EU, Europe 2020 Flagship Initiative: Innovation Union

EU environmental criteria for public procurement of 19 product groups (and more will come)

1. Copying and graphic paper
2. Cleaning products and services
3. Office IT equipment
4. Construction
5. Transport
6. Furniture
7. Electricity
8. Food and Catering services
9. Textiles
10. Gardening products and services
11. Windows, Glazed Doors and Skylights
12. Thermal insulation
13. Hard floor-coverings
14. Wall Panels
15. Combined Heat and Power (CHP)
16. Road construction and traffic signs
17. Street lighting and traffic signals
18. Mobile phones
19. Indoor lighting

http://ec.europa.eu/environment/gpp/eu_gpp_criteria_en.htm

Material and methods

A) Finnish Funding Agency for Technology and Innovation (Tekes) has a special funding instrument for the preparation of innovative public procurement (100 000 – 200 000 E /case). The material on the Tekes Web-pages and that produced by the procuring organizations were inspected.

B) A recent building design competition in Finland was examined in more detail (the Synergy design competition).

The analysis is based on material found online - www.environment.fi/eco-officebuilding and in the literature (Nissinen et al., 2010; Rintala & Nissinen, 2011).

A. Finnish innovative public procurement cases

Case	Procurer	Main innovation focus
Energy production plant, with ORC technology	Energy production company owned by a municipality	Implementation of a small CHP power plant based on ORC technology and planning of the associated process and procurement
Timber-framed residential area	A municipality	A residential area promoting timber construction and designed to meet the needs of the municipality

A. ... innovative... cases /2

Case	Procurer	Main innovation focus
Developing two tourism centres to examples of low carbon footprint, i.e. "ecological tourism industry"	A municipality	Vision and actions for developing the area, by drawing up a procurement (i.e. competition) program and award criteria
Innovative public procurement solutions for functionality, energy saving and other requirements	A municipality	Developing and reinventing a procurement process that enables the implementation of functionality and life span requirements

A. ... innovative... cases /3

Case	Procurer	Main innovation focus
Using a design competition to procure new types of services: Design competition for a program to reduce homelessness	Three municipalities	Design solutions for three different sites and service models will be produced. The features of the service will guide the design of each building.
Energy-efficient and needs-oriented supported housing	Company mainly owned by a municipality	Energy-efficient solutions, control and regulation technologies, space solutions, and promotion of independent living for the elderly

B. Design competition and solutions for sustainability of office and laboratory building 'SYNERGIA'



Plan: New building for 625 experts and researchers

Senate Properties and the Finnish Environment Institute (SYKE) organised a competition for the design of the Finnish Environment Institute's office and laboratory building. The building will be located in the Viikki Science Park area, in eastern Helsinki.

Why new building? – What about considering the need?

- now distance between office building and laboratory building 15 km
 - need for renovation of the present building in the coming years
 - possibilities for existing building cleared out for several years
 - benefits of co-operation in the environmental campus area (in a statement of the Parliament).
-
- 3-5 floors, room program for 12855 m² (offices, laboratories, joint use spaces).

Earlier example: Low2No.org

RESPONDENT EVALUATION PROCESS

A committee within Sitra will review the submittals and score the respondents based on the following minimum criteria:

Quality of the team

0-40 points

- Complementary competencies including some or all of the following: integrative urban design, climate analysis, environmental systems, urban economics, business development, energy policy and infrastructure, transportation, and technology
- Overall good balance of competencies, with particular focus on sustainability
- Competencies addressing the behavior, demand and choice principles that drive the long-term efficacy of sustainable solutions.
- Knowledge of the scientific principles of environmental, climate, and climate change issues

Experience of the team members

0-40 points

- Record of professional experience in design, building, and innovation by individual team members, especially in the area of sustainability
- International experience of the individual team members, especially in the area of sustainability
- Experience with large-scale, mixed-use development, especially in the area of sustainability
- Experience working in multidisciplinary teams, especially in the area of sustainability

Evidence of systemic thinking

0-20 points

- Experience with developing scalable solutions
- Experience coordinating and implementing large-scale innovations
- Experience in analysis of urban systems (energy, transportation, ecological, etc.)

The teams will be measured through the lens of past rigorous work on sustainability or the clear interest in pursuing sustainability as a central design motive. A maximum of five teams will be selected to continue with the design competition.

Contract notice: expertise

Public tender calls invited design teams to submit professional qualifications of teams with such a mix of competencies that would reassure design services for a highly eco-efficient building, i.e. competence not only in architecture but also **energy efficiency** (energy simulation) and **ecological sustainability**.

You can find the contract notice and it's appendices in Internet:
www.environment.fi/eco-officebuilding

See also earlier Low2No competition (by SITRA):
www.low2no.org/competition/downloads/Low2No_RFQ.pdf
www.low2no.org/

Six teams were selected for the design competition of Synergia.

Contract notice: expertise

Expertise and experience in the planning of ecologically sustainable buildings, or their related design solutions, that can be considered as applicable to this project.

NOTE: Ecological sustainability as it applies to this project is described in Section II 1.5. "Brief project description" of the procurement notification.

3.6.1 References concerning the kinds of designs for buildings or solutions that can generally be considered examples of ecologically sustainable construction (including buildings of timber construction). Mentioned in this connection shall be the building object's name, type, scope, description (of solutions and targets deviating from conventional construction practices), design period, possible implementation period, and the person's role in the project.

3.6.2. Participation in research and development projects related to the subject.

3.6.3 Articles concerning the ecological sustainability or environmental friendliness of buildings published in the sector's professional journals or scientific publications.

Competition program: criteria

In the competition program, the award criteria were grouped into four sets, i.e. ecological, architectural, functional and economic. No priorities between these criteria sets were presented.

The following aspects were given as the ecological goals, to be used in the comparison of competition entries:

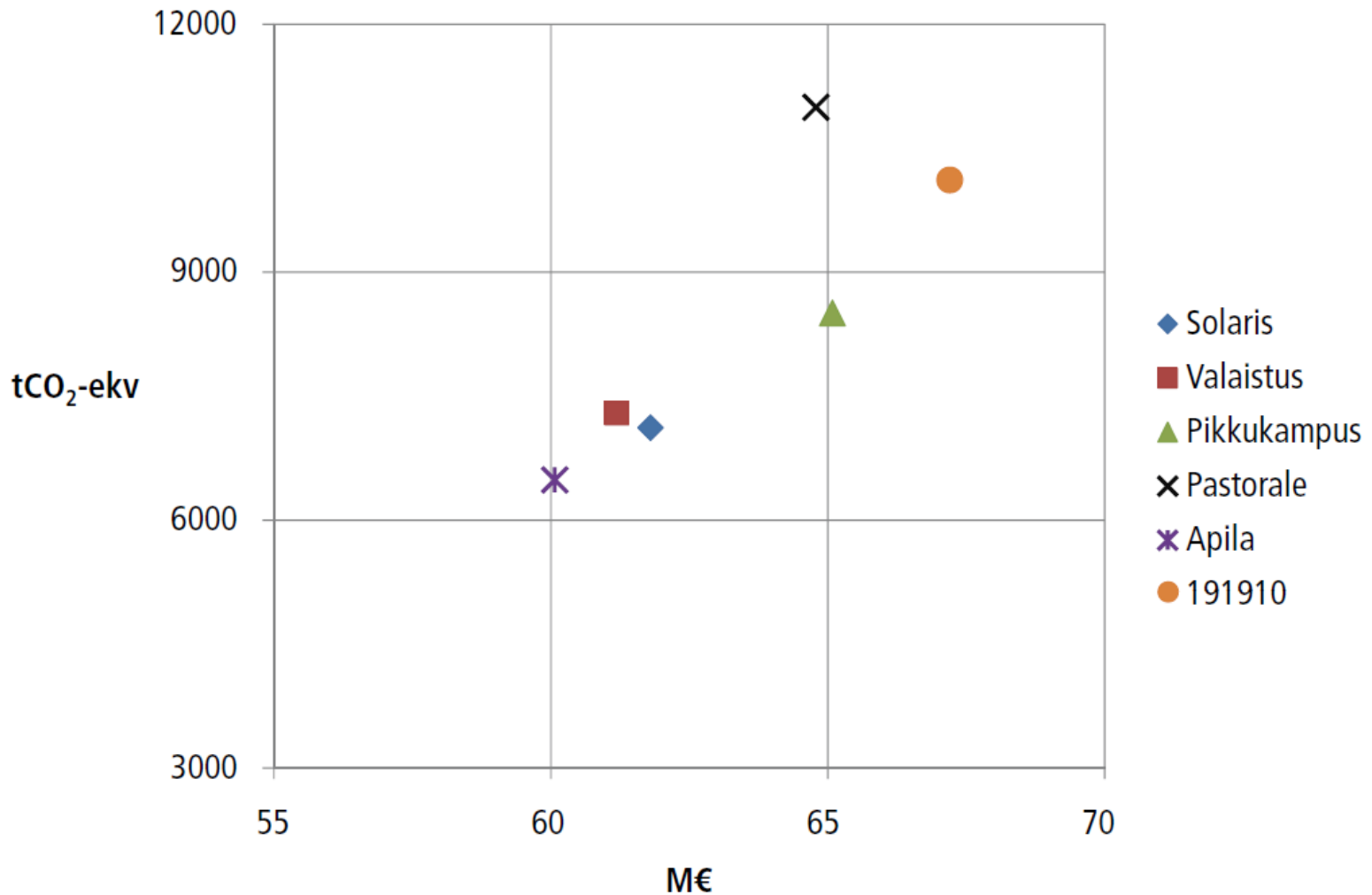
- fulfilling the criteria for 'almost zero-energy buildings' (a limit value for energy use was given),
- local production of renewable energy,
- minimizing the carbon footprint of the main structures of the building (a rough estimate by a tool was required), and
- other environmental objectives stressed by the designers themselves.

See especially chapter 3.3. in the competition programme which you can find at: www.environment.fi/eco-officebuilding

Award: m², energy use and emissions

COMPETITION WORK	1	2	3	4	5	6
	Solaris	Valaistus	Pikkukampus	Pastorale	Apila	191910
Net floor area m ² (programme area 12855 m ²)	14000	13100	15800	14600	12700	14800
Net floor area m ²	18300	18800	21500	18200	19800	20400
Gross floor area m ²	20600	20300	23600	20100	21800	23800
Cost estimate, EUR million	54,9	54,6	58,5	57,7	54,1	61,1
E-figure according to minimum requirements, comparative solution, MWh/a	5104	4513	4575	4272	4523	4053
E-figure, design solution with average energy consumption, MWh/a	3576	3517	3502	3631	3508	3281
E-figure, actual design solution, MWh/a	2851	2765	2830	2985	2674	2780
E-figure, actual design solution, kWh/(m²,a) without user electricity	99	92	97	109	85	93
30-year energy use, carbon dioxide emissions, tCO ₂ -e/annum	7589	7146	6904	7726	6005	6102
Carbon footprint of main construction, tCO ₂ -e/annum	-470	147	1600	3269	481	4013
Carbon footprint of main construction, kgCO₂-e/annum/m²	-37	11	124	254	37	312
Combined carbon footprint of 30-year energy use and main construction, tCO₂-e/annum	7119	7293	8504	10995	6486	10115

Award: emissions vs. costs



Award: APILA

Authors

JKMM Architects and
ECADI (East China Architectural Design & Research Institute Co., Ltd)



Award

According to the Competition Jury:

The entry had the lowest energy consumption, as well as the lowest greenhouse gas emissions estimated for

- energy use of a 30-year period, *
- its main building materials.

This demonstrated that it is possible to obtain excellent energy performance in a large building mass cost-effectively.

The competition also proved that demanding norms do not limit creativity. The environmental targets inspired fresh innovations that create the prerequisites for a new kind of dynamic architecture reflecting our own times.

** if you will apply a similar approach, use 100 years and a scenario for emissions of energy production*

Conclusions /1

Buildings and services for elderly people are two large product groups for innovations in Finnish public procurement.

Some innovative processes may deal with both, since customizing buildings for elderly people often means large changes in the buildings or even totally new buildings, with special spaces and functions.

The model for requiring environmental expertise among members of the design team could be used more (both buildings and services).

Conclusions /2

Mitigation of climate impacts is well accepted to the user-defined objectives of Finnish public procurers that strive for new types of solutions (i.e. innovations).

Energy efficiency and low emissions of greenhouse gases are understood as key properties of the future product and services in the fields of 'services for ageing people' and infrastructure like buildings.

It is evident that the type of funding for innovative procurement has several kinds of impacts:

- financial resources for the preparation stage of the procurement
- networks (procurers and various experts) to support the work
- by the project rules commits the organization to goal-oriented and productive work