



# STAND-INN

## Standards for innovation in construction and fm



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## Managing sustainable construction in Europe

All the Europe INNOVA clusters and networks met in Madeira in March 2007 to exchange information and ideas between each other and with the European Commission. What came out of this event was the clear message that STAND-INN was right on cue for the Commission's current and future agendas.

Since built assets account for over a third of the man-made impact on rising temperatures, sustainability in the face of climate change is now top priority for the construction industry. But the analysis necessary to assess building design, construction and operation is not really available without the simulations made possible by object modelling. Furthermore the opportunity to run a building design through several design iterations to optimise its sustainability gives designers the freedom to consider ideas and options which tedious manual methods of analysis would rule out on time and cost grounds.

The other message from Madeira is that innovation is seen as crucial to strengthening EU competitiveness in world markets. Alongside Framework 7 the Commission has created a new Competitiveness and Innovation Framework Programme (CIP), lasting from 2007 to 2013. CIP is intended to encourage the use of information technologies, environmental technologies and renewable energy sources. These objectives, combined with the featuring of SMEs, make construction one of the key industries for this programme.

The participants in STAND-INN are well placed to take advantage of this opportunity to entrench sustainability and information standards as drivers for modernisation of the European construction industry and reduction of its carbon footprint.

Svein Erik Haagenrud  
STAND-INN project manager

## STAND-INN progress: building products and services

An exercise to map national and international standards relating to sustainable building has just been completed by project member Wolfram Trinius. Some 32 items were mapped, ranging from the well-known standards such as ISOs 15392 and 15686-1 (sustainability in building construction and service life planning) to national standards and EU research projects.

Another strand of the research into sustainable building products and services is the report on modularity, also prepared by Wolfram Trinius. The service life performance of a product may vary according to the larger product of which it forms a part, or the scenario for a particular project. So separating out the environmental impact of each product in a modular approach would help transparency – and information exchange between modules (the individual products/components) would have significant advantages if it were IFC-based.

This guidance report looks at standards in use or under development and prospects for environmental product declarations. 'Product information flow using IFC standards would open the way to innovative solutions for sustainable building products and services,' says Wolfram.

The guidance report will be published as part of the STAND-INN project.  
Contact: Wolfram Trinius (trinius@trinius.de). Work package 2.

## Editorial

Our third issue has two themes. The first is our role in the European economy and the Europe INNOVA and CIP programmes (see lead article and page 4). The second is how sustainable housing, innovation and standards play out in practice. On pages 2 and 3, we present two case studies, drawn from a STAND-INN research report.

Svein Erik Haagenrud

June 2007

## Public procurement

STAND-INN is working to raise awareness of ICT-based standards and sustainable building in the public sector. After two reports on best practice and the barriers to uptake, the focus has turned to the impact that standards are having on public procurement.

Contact: Juan Pérez (juan@labein.es). WP4

## Policy recommendations

An analysis of how IFC supports sustainability is now in draft. The report emphasises the diversity and flexibility of the IFC standard. When finalised, it will be publicly available as one of the project deliverables.

Contact: Jeffrey Wix (jdw@aec3.com) WP7

## Spreading the findings

Events to disseminate the results of STAND-INN are being planned, with two events for each participating country and a full-scale conference at the end of the project.

Contact: Christopher Groome (chris.groome@b-r-t.co.uk) WP5

## Handbook

A handbook distilling the research from STAND-INN will be published at the end of the project; preparation is underway.

Contact: Celson Lima (clima@uniova.pt) WP7

## Diary dates 2007

27 June *Urban sustainability*, Glasgow

7 Aug *EUREKAbuild*, Oslo

21 Sept *IAI Italia*, Milano

2 Oct *RTS Building Forum*, Finland

# STAND-INN and sustainable housing

With this issue of the newsletter, we begin a series looking at examples of sustainable housing, collected during our research. Our research report took 17 examples from across Europe, featuring detached houses and blocks of flats, either owner-occupied or rented. The aim was to cover the range of housing and see how sustainable building is progressing in Europe's varying climates. We looked at the measures used to achieve energy efficiency and also focused on the standards adopted to achieve a more sustainable way of building.

We present two contrasting case studies in this issue: one from north Europe (Finland) and one from southern Europe (Spain). The studies show how project professionals have tackled different challenges to meet a common aim. Complementing the study is an interview with Petra Jebens-Zirkel, an impassioned supporter of sustainable buildings who runs a flourishing practice in northern Spain.

## Low-impact, rural house in Huesca, Spain

### Sustainable living in the Pyrenees

#### The project

This rural house at Oncins, Huesca, was built at a remote location in the Spanish Pyrenees in 1999 by architect Petra Jebens-Zirkel to put 'bioconstruction' principles into practice. The house consists of a dwelling and an office, with storage facilities. The radical design initially met with opposition from the local planning authorities.

#### Innovation

The house was built according to the principles of environmental best practice as set out by the Spanish National Association of Bioconstruction. It is a zero-energy house, balancing energy generation, conservation and consumption.

Energy is captured and conserved throughout the design. There are 13 photovoltaic panels. The south-facing façade has 28sq m of glazing. The roof has a thick layer of cork insulation (15cm). The load-bearing walls (except on the south façade) are 29cm thick and made of ceramic blocks. The design uses natural ventilation, the creation of shade through extended eaves and solar gain to develop a 'passive house'.

#### Sustainability

The project takes a holistic view of sustainable building, from the sourcing of materials to low ongoing maintenance. On the south façade, the glazing needs cleaning only once a year and the wood revarnishing every five years. The lime wash needs renewing every five years and the toilet compost materials have to be removed every two. Great attention was paid to thermal comfort, which has been achieved through cost-effective energy performance.

#### Standards

ANB standards were used to ensure environmental best practice. Passive house standards were also observed. In her own and clients' houses, the architect always builds to more stringent standards of insulation than the legal minimum.

#### Lessons for the future

After initial opposition, local planning authorities were won over, and the project has been disseminated as best practice throughout the region. Despite a problem in finding specialist labour locally, the project was completed swiftly to a modest budget (€265/sq m at 1999 prices). The experience here could be applied to other building sizes and locations.

#### Project participants

Petra Jebens-Zirkel (architect and owner)



Top and centre: The house has a remote location high in the Pyrenees and is built of natural materials



Left and right: The glazed south-facing façade benefits from the climate, with 300 days of sunshine a year



## An interview with Petra Jebens-Zirkel

*Petra Jebens-Zirkel is a German architect working in Spain, where she has built 40 eco-friendly houses in Aragon and Catalonia, starting with her own. The Rural House, Huesca, some 500m from her home, provides office and guest accommodation.*

**What factors affect designing sustainably for a south European/Pyrenean climate?**

Here in Huesca we have 300 days of sunshine a year. But we are located at 1,100 m, so it's cold in winter. But even in winter, no daytime heating is needed, thanks to the south-facing windows. We have used materials that retain heat and coolness – they have good thermal inertia.

**Was it more expensive to build sustainably? Is the extra cost a deterrent?**

We build to the same cost as other houses; it's not more expensive. In two to five years we achieve payback, so in the long run, it's cheaper. We create an unsophisticated structure and source simple materials. I like to help people build their own houses – this architecture has a soul. Cost is not a deterrent, and clients come to us.

**What was your experience in sourcing materials and labour for the project?**

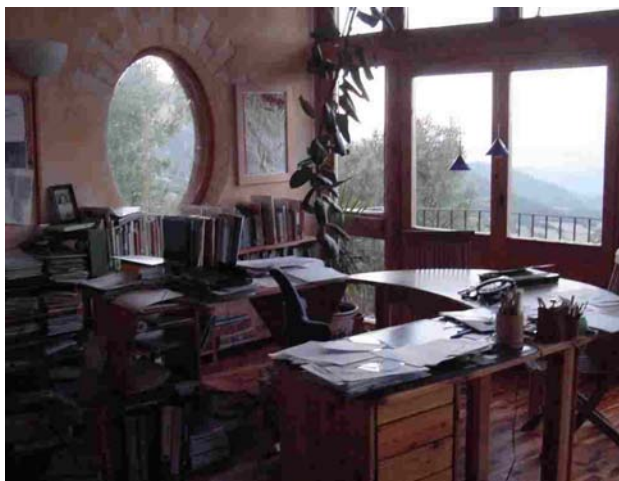
Around 15 years ago, it was hard to find natural building materials. The connection between local houses and local materials had been lost, and most buildings were of concrete. The materials I needed were only available some distance away. Then three years ago, some clients opened a store more locally, selling ecological building materials – we have pioneered! Despite some negative experiences with builders, the local labour force has mostly become enthusiastic about this type of project.

**What personally motivated you to get involved in sustainable building?**

At university, I already felt there was something wrong with the steel and concrete and glass of Berlin. I wanted to create buildings for people who have to live in them. Over time, I saw that we were working against nature.

**How do you see the future of sustainability in building?**

Without sustainable building, there will be no future. Architecture that uses so much energy, producing CO<sub>2</sub> emissions, can't be sustained – I'm convinced. Sustainable building must be made more widely known. Here in Spain things are changing slowly – too slowly – we must go on faster.



*The house provides an office for its architect owner, with guest accommodation below. Wood, bought locally and inexpensively, is used as a fuel*

## MERA Nordic Passive House, Espoo, Finland

### Impressive energy savings at little extra cost

#### The project

A block of 20 flats was constructed in Espoo in 2005 by MERA, an informal partnership of construction companies. One flat was developed as a Nordic passive house.

#### Innovation

The building services for the flat could be simplified as radiators were no longer needed. Instead, a ventilation system was integrated with the heating: in other words, heat generated by, say, household appliances is recovered by the ventilation system. The building was constructed of concrete, and the windows were tightly fitted to prevent draughts and heat loss. These various measures increased construction costs by only 1.7% and the payback is estimated at 5–7 years.

#### Sustainability

Energy conservation is impressive in every respect. The windows have a U value of 0.80 and with a solar transmittance of only 20% to protect against the heat in spring and summer. When tested in 2005–06, the indoor environment score was above S1 on the Finnish FiSIAQ scale. The flat uses 70% less heating as compared with a typical block of flats in Finland.

#### Standards

The following were used: FiSIAQ 2000 (a national voluntary guideline for indoor climate); ISO/DIS 15686-5: 2004 for life-cycle costing calculations; EN 832: 1998 for energy calculations.

#### Lessons for the future

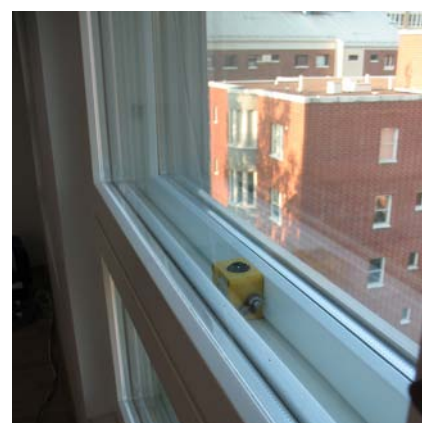
The knowledge and expertise to build Nordic passive houses are there: what is lacking is the commercial will to exploit them. Large companies are less agile in adapting to change and smaller companies are often better placed to adapt to new model of building.

#### Project participants

VTT (Technology Research Centre, Finland); MERA companies (Reponen Oy, Meptek, Skaala).



*Exterior wall constructed of concrete tiles giving the appearance of brick*



*The windows are tightly fitted to avoid heat loss and have quadruple glazing*

# INNOVA – the bigger picture

STAND-INN is one of six ‘network’ projects on standards within the larger Europe INNOVA initiative. So what exactly is INNOVA and how does STAND-INN compare with its sister projects?

Europe Innova was set up with EU sponsorship in 2006 to foster entrepreneurial innovation. The Innova standards networks have the task of identifying the standards in use across key industries and promoting those that work best for innovation. “More effort is needed to cut back the ‘jungle of standards’ by identifying the most promising ones,” says Reinhard Büscher, Innovation Policy Development, DG Enterprise and Industry.

## STAND-INN’s sister projects

The individual Innova network projects on standards cover six areas: healthcare, product technology, shipbuilding, furniture, public procurement and, with STAND-INN, construction. If the acronym STAND-INN has puzzled some, the other projects have equally unexpected names: DEPUIS, EUROMIND, INNOVAFUN (that’s furniture, with the ‘r’ omitted, not the leisure industry), STEPPIN and BioHealth (see panel).

Each INNOVA network project is on a journey similar to that of STAND-INN. Each has started its work by identifying what standards are actually in use and analysing the findings of this research. Examples of good practice are, where possible, highlighted at this point.

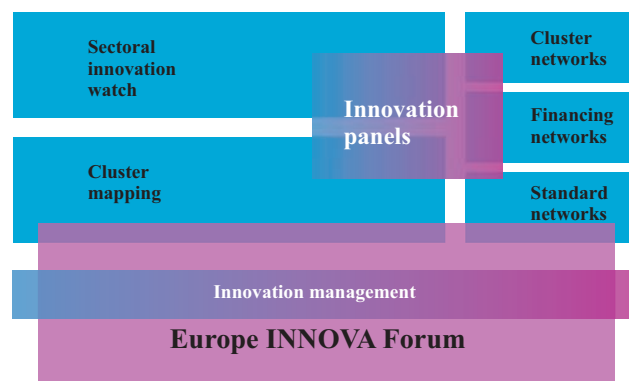
The network projects face problems specific to their industries. The furniture industry, for example, is made up of small companies, often family owned and run, where traditional ways of doing things are engrained and change seems like family disloyalty. Shipbuilding, by contrast, is an industry made up of a few large companies. Under threat from Asia, these companies, once fiercely competitive between themselves, have moved towards greater collaboration.

In product data technology, one challenge is to encourage the use of standards among SMEs in order to improve environmentally friendly design. In public procurement, with its huge spending power, well-implemented standards may help money-conscious public-sector clients avoid short-termist purchasing that hinders sustainability. Healthcare must take account of privacy issues. And in construction, uptake of IFC standards and building information models (BIMs) – despite their efficiency benefits – varies unacceptably across Europe.

## Future work

The six INNOVA network projects are now about one-third through their work programmes, with research results being analysed and dissemination underway. What next? The European Commission’s Enterprise and Industry DG is looking at follow-up projects for the 7th Framework Programme for lead industries such as construction (see page 1).

‘If we can demonstrate the potential for innovation in construction and our ability to speed it up, we should be well placed for further support in the new Competitiveness and Innovation Framework Programme,’ concludes Christopher Groome, IAI International, who is co-ordinating the roll-out of STAND-INN communications.



Europe INNOVA's architecture

## STAND-INN and its sisters

### BioHealth

The BioHealth project encourages the use of standards in the complex supply chain and administration of healthcare, with special regard for security and privacy issues.

### DEPUIS

Stands for Design of Environmentally friendly Products Using Information Standards. The project aims at promoting sustainable product design, especially among SMEs.

### EUROMIND

A project in the shipbuilding industry to stimulate co-operation between European shipyards using open standards and best practice.

### INNOVAFUN

A project to ‘Innovate Furniture Business Process’ (hence the name) and help the furniture supply chain become more competitive, using the industry funStep standard and harnessing the support of an existing 600-member strong special-interest group (funStep Interest Group).

### STEPPIN

An acronym for Standards in European Public Procurement lead to Innovation. A project to encourage innovation in public procurement via three stages or ‘steppin stones’: the right information tools, involving individual procurement officers and getting the backing of their organisations.

### STAND-INN

Our own project aims to bring about improvement in business process and sustainability in construction, with an emphasis on Building Information Models (BIMs) and IFCs.

### Other Europe INNOVA activities

The broader programme includes an innovation watch and innovation panels, cluster mapping, cluster networks to transfer good practice and finance networks to develop tools for innovative financing. Visit [www.europe-innova.org](http://www.europe-innova.org)

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