The District of Tomorrow as a catalyst for a SBE
(The bottom up approach for sustainable built environment in Euregion Meuse-Rhine)

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The District of Tomorrow (TDoT) program serves as a research and demonstration platform for new energy and sustainability at the European Business and Science Park Avantis Heerlen/Aachen. A sum of 5 million Euro and 60 partners are involved to realize this program. The main research questions are: 1) is TDoT a good tool to mobilize and involve the market and 2) is this program replicable? Keywords of this paper are: education, innovation, transition, Euregion Meuse-Rhine. The program TDoT fits in the conference topic: tools for cities and districts and "0-approaches". The District of Tomorrow is not only a good tool, described in paragraph 1, but leads to new programs for sustainability which will be explained in paragraph 2.

1) The District of Tomorrow is a good tool to mobilize and involve the market

During the last 5 years teams of students from several polytechnics and professionals from small and medium sized enterprises and cities built training houses in Limburg. It started in Horst with only one contractor Haegens Bouw, no real architects and several smaller companies involved with help of BouwOpleidingCentrum and ElektroWerk. The educational partners involved were: Gilde, Zuyd University, Dendron College and Raayland College. Gilde as the vocational education partner had the lead in 2005. From 2007 on all the students of the last year of the faculty of built environment of Zuyd University designed “0-impact” houses. A jury of international experts chose a design which will be built in the next years with approximately 60 business partners. TDoT demonstrates new concepts in four buildings and terrain:

1) 2009-2011 passive house => 0-energy
2) 2010-2012 expositions and demonstration => concept op 0 (energy, water, air, land, material)
3) 2011-2013 exergy house => 0-energy or energy-plus
4) 2012-2014 recycle house => 0-material
5) the terrain will be used for electrical mobility, 0-use of water, air and land.

Figure: The District of Tomorrow

Figure: Building 1 Passive House

Figure: Building 2 Expositions and Demonstration

TDoT has three pillars: educational innovation, applied research and innovation in the market for sustainable and energy efficient buildings and technology. These three pillars lead to three different programs described in the next paragraph 2a up to 2c. All the programs will focus at front running developments, in buildings and urban regions. Keywords are: 0-energy buildings, 0-material districts and climate neutral cities. The programs should provide the partners the latest examples of good practices and support research towards this unavoidable future for sustainable built environments. The aims are transforming existing buildings and districts, as the main challenge for the future. The concept of 0 (energy, water, air, land, material) will be the guideline for our projects.

One of the challenges was to increase the number of students and companies who could participate in the program. TDoT wants to organize an open innovation process because of the need of transition to a sustainable built environment. Until now it is difficult to find a balance between open innovation process (as much as possible partners) and a managerial easy to handle process (just one partner of each field of knowledge). One can see the large group of 48 official participants at our website www.thedistrictoftomorrow.org. But more organizations are interested to involve such as the RWTH, Ballast Nedam, the municipalities of Kerkrade and Maastricht etc.
So, the first question can be answered positive, because in October 2010 approximately 250 bachelors passed their exams and 48 public parties and companies were involved in this program.

2) The District of Tomorrow is a replicable program

More and more parties are convinced of the conclusion of the first hypothesis. That is the mean reason for developing more programs in this field. That is why The District of Tomorrow can be seen as a replicable program. The replication can be demonstrated with 3 programs. The educational transition started in 2005 with three training houses in Horst and Weert in the Northern part of Limburg. An up scaling of TDoT will take place in 2010 in cities in the region, starting with a project in Kerkrade West. Participants are challenged to copy the best practices.

In February 2010 students from Heerlen, Aachen, Liège and Nizhniy Novgorod started with an international design program. The city of Nizhniy Novgorod will build their own TDoT based on these designs. Three other programs are interesting to mention and described below.

In close cooperation with iiSBE, TDoT was also a starting point for the international sustainable building conference, SB10 Western Europe. SB10 will be held on 11-12-13 October 2010 in Maastricht, Hasselt (Heusden-Zolder), Liège and Aachen which are capitals of the provinces in the Euregion Meuse-Rhine. About 4 million inhabitants speak three different languages and live in five provinces, each with different regulations on (sustainable) building.

Figure: Euregion Meuse-Rhine

The District of Tomorrow has lead to RiBuilT the Research Institute of the Built Environment of Tomorrow. The target area of RiBuilT is on more levels: 1) on a visional and strategic level; RiBuilT is part of Zuyd University and 2) on a knowledge level; RiBuilT is one of the organizations behind SB10. During several sessions of SB10 towards a 0-impact Euregion a roadmap will be set up as a governance tool. All knowledge, governance and other results are continuously being implemented in the study projects of RiBuilT. TDoT and the existing districts like Kerkrade West will be used for training and research. The institute’s mission is to develop and disseminate knowledge to support the transition for 0-impact buildings and built environments, new and existing.

RiBuilT is an initiative of Zuyd University and under development with partners. At this moment from different levels and from different knowledge fields research and knowledge dissemination agenda is being set up, to facilitate the transition towards a 0-impact Euregion. The first milestone will be the knowledge aspect of SB10, but continuously the knowledge will be implemented in TDoT. On the short term, the aim is to set up RiBuilT formally and start research and dissemination of knowledge continuously. On the medium and long term RiBuilT will organize more conferences (SB12), and will work together closely with more organizations.

Relationship with similar experiences in other EU member states will be a new challenge. Most central actors involved are from the education and research sector, working at research and educational institutions. RiBuilT works together with other NGO’s and commercial parties for funding of research. RiBuilT has close contacts with is iiSBE, one of the international partners. The programs 2a
up to 2c describe three pillars: a) educational innovation, b) applied research in cooperation with public authorities and c) innovation in the market for sustainable technology and energy efficient buildings. Important is what can be learned. The District of Tomorrow functions as a catalyst for a sustainable built environment.

2a) Program: Future Proof Technology Education in Parkstad

It was unique that many parties in Limburg were involved in the training house projects in Horst and Weert. Unfortunately, a written or transferable way of working wasn’t available, due to a lack of time and money. TDoT missed these guidelines during its startup.

Future Proof Technology Education in Parkstad is the name of the program financed by “Het Platform Beroeps Onderwijs” (HPBO) which will start in September 2010. Parkstad is a cooperation of 7 cities in the South Eastern part of Limburg, the Netherlands, close to the borders of Germany and Belgium. The program has the aim to develop a transferable method or way of working for TDoT and other universities, vocational schools and the business communities. The main goal is to set up pilot projects which should lead to better vocational education. TDoT is a real life training community or learning company and it becomes a common tool for open innovation. It demonstrates co-creation with educational partners, research institutes, business, and public authorities in the region. The support for education given by businesses is done by: members of the MT, sponsors, consultants on knowledge and organization, guest speakers, ‘ambassadors’, and well trained and experienced employees. They identify bottlenecks in education and project execution. They provide the projects for the future in the ‘real’ neighborhoods of the Meuse-Rhine region.

The method should contain:
- Transferable approach for development and implementation of technical projects
- Organizational framework for project leaders and training institutes
- Professional content for up to date knowledge, skills and attitudes
- Educational framework for each level and type of education and knowledge chain

The educational interventions are the main issues to be learned:
- Removal of barriers between schools and departments
- Training of competencies
- Flexible study programs
- New training packages
- Organizing practical training places
- Align curricula
- New support structures

The motto is: together we will create our own future. The educational interventions show what has to be done in and outside schools. The practical learning communities for a building, project or real life problem is the way how this can be done.

2b) Program: Cradle to Cradle of the Province of Limburg

The District of Tomorrow functions as a catalyst for a sustainable built environment. TDoT is one of the main examples which will be used, showed, and demonstrated by the Province of Limburg to other regions in the EU as an example for sustainability. The Province is the program leader of the Interreg IV-C Cradle to Cradle program.
The EU-wide interregional Interreg IV-C program is developed to exchange knowledge and best practices to encourage cooperation between developed and less developed regions across the EU. Purpose of the program is to exchange experiences and jointly design approaches and tools that enhance the effectiveness of regional development and contribute to economic modernization.

The Cradle to Cradle (C2C) approach on waste, offers a breakthrough in waste prevention and production in closed loops. The C2C concept envisions a challenging future, where the emphasis is on creating eco-effective solutions. The power of C2C lies in its ability to mobilize and inspire. The Cradle to Cradle Network (C2CN) in Limburg is a capitalization network which, aims at reducing raw materials' utilization, generation of less waste and less environmental pollution as well as enhancing innovation and economic development. In addition, C2CN incites and inspires to action towards a more recycling society. Zuyd University is member of the C2CN. The C2C approach is in line with the concept of 0 of RiBuilT. RiBuilT will become the sparring partner for networks in other regions in the EU.

2c) Program: IDES EDU

The overall objective of IDES-EDU is to create education and training courses for students and post graduates in the field of Integral Design for Energy and Sustainability (IDES) in the built environment. The aim is to implement in multidisciplinary teams EPBD (=Energy Performance Building Directive) and the targets set by the EU. The courses will be developed within national consortia in which the educational institutes will collaborate with relevant key actors and stakeholders, such as representatives and branch organizations of building sector such as constructors, real estate developers, architects, research institutes, users, suppliers and consultants. So this is for TDoT a third pillar to innovate the market for sustainable and energy efficient buildings and technology.

Program partners of IDES-EDU are among others: Cauberg-Huygen Consulting Engineers, Zuyd University, Czech Technical University Prague, University of Ljubljana, Fachhochschule Burgenland and Federation of European Heating and Air-conditioning Associations.

In order to realize this, IDES-EDU will develop Post Graduate and Master Courses at 15 European educational institutes including training packages. These will be based on horizontal themes (EU wide around themes based on EU perspectives, visions and policies) and based on vertical themes (specific needs from stakeholders, especially in the building sector). The courses will be developed and implemented in the participating educational institutes. This will be done with end-terms, accreditation and a framework for common certificates in 15 countries. The aim of the program is to involve: 600 students, 150 architects, 300 engineers and 150 miscellaneous professionals.

Zuyd University is work package leader of WP 4: Development of objects or buildings for training and education. The objective of this work package is that the courses will be concretized in practical cases by the design, elaboration and realization of so called training and education building objects. Within this project two institutes will also actually realize and build these buildings within the time of the project: Zuyd University (TDoT) and University of Ljubljana. The realization of this work package is very depending on the specific national situations and possibilities in terms of needs, market changes, funding, financing and participating industries. It is considered as vertical theme activity. However, the overall targets on energy consumption, CO2 reduction, percentage of renewable materials and base components to include are considered as a horizontal theme activity of The District of Tomorrow.
Conclusions

So, the first hypothesis “is it a good tool?” can be answered positive, because in October 2010 approximately 250 bachelors passed their exams and 60 public parties and enterprises are involved in the program of TDoT. An up scaling will take place in the region, starting with a project in Kerkrade West. Participants are challenged to copy the best practices. In February 2010 students from Heerlen, Aachen, Liège and Nizhniy Novgorod started with an international design program. TDoT is involved in three different international programs on sustainable built environment.

The provisional conclusion of the second hypothesis “is it replicable?” is that the results are replicable in the region and far beyond. The transition to a sustainable built environment starts with a) formulating the target (=what) “the concept of 0” for the Euregion in 2030 and b) implementing practical learning communities (=how) for buildings, projects or real life problems. The educational interventions are necessary to achieve these goals. Together we will create our own future.

More information

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Heerlen, May 23, 2010
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