Challenging and valuable

May 7th 2008

Inaugural speech,
prof. J.D.M. van Hal MSc PhD

TU Delft

Faculty of Architecture, Dep. Real Estate & Housing

Delft University of Technology
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Inaugural speech

Given on May 7th 2008
at the occasion of the acceptance of the position of
Professor Sustainable Housing Transformation
at the faculty of Architecture
of the Delft University of Technology

by Prof. J.D.M. van Hal MSc PhD
Colofon

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Faculty of Architecture, Department RE & H

Delft, May 2008
Challenging and valuable

Sir Rector Magnificus, members of the Executive Board, fellow colleagues and other members of the university society,
Honourable listeners,
Ladies and gentlemen,

Today is a festive day. I celebrate, with you, my appointment as professor Sustainable Housing Transformation at the faculty of Architecture of the Delft University of Technology. An appointment that delights me because it allows me to bring a social task to the attention of a wider public. And, even more important to me, it gives me the opportunity to search for solutions for this task with current and future experts. Facing this challenge together with students and fellow colleagues attracts me to this appointment. Above all a challenge that involves a section of our built environment, the existing housing stock that in my view has met with too little respect from professionals. This building section is very valuable, more so than is often acknowledged. This explains the title of my inaugural speech: Challenging and valuable.

In this inaugural speech I wish to explain to you the task that my chair will focus on, why this task is so challenging and why I entitle it to be valuable. I would also like to explain how I think the task should be approached and how I hope to do so in cooperation with the students and colleagues of this university.

Part 1: The task Sustainable Housing Transformation
I begin with the first part of this address: which task keeps me occupied? The task Sustainable Housing Transformation. That is the official title of the chair that I occupy. This chair was previously occupied by my honored colleague André Thomsen. My translation of the English chair title to Dutch is: 'Duurzame Transformatie van Bestaande Woningen en Wijken' (Sustainable transformation of existing housing and neighborhoods). Therefore I will speak today about an extensive sustainable approach of existing housing and neighborhoods.

Housing
What I like about the subject in this profession, existing housing and neighborhoods, is the familiarity. Everyone lives somewhere, in an existing house. Houses I used to live in myself form a nice overview of the area my chair covers:
- The post-war social housing stock, the house of my birth in Rotterdam
Lombardije [fig. 1];
- The large new neighborhoods of the sixties, in my case in Slikkerveer [fig. 2];
- Houses built under private direction, like my parents’ seventies’ home in Ridderkerk, in a neighborhood they now call a cauliflower neighborhood [fig. 3];
- Houses that are threatened with demolishment, like my student home here in Delft at the Van Leeuwenhoeksingel [fig. 4].
Sustainability
The Dutch word for sustainability, duurzaamheid, is less familiar. It is also a confusing term since this Dutch word has two meanings. It means both what the English call 'durable' and which can be understood as 'having a long life' and what the English call 'sustainable' and which has more to do with the environment.
I focus on the second meaning: environment.

However, my interpretation of the term sustainable has broadened with time. Following Elkington's introduction of the Triple-P approach the environment (the Planet) still has my attention, but now completely in correlation with the interests of man (People) and the economical interests of all parties involved (Profit) [fig. 5].
Concerning the interests of people with Sustainable Housing Transformation: they wish foremost to live comfortably at low costs in attractive and safe neighborhoods. The economical interests are less easily summarized since they may vary considerably. Think of lowering the costs of living for residents thanks to energy saving systems. But also business benefits for market parties fall under profit. For example the rising real estate rates or competitive advantages for market parties. Especially that P of Profit entails an immense change. In the past taking care of the environment was considered opposed to successful business dealings. Fortunately that opinion is no longer held. Making money is allowed, as...
long as the environment also profits from it. Good Growth, is what they call this in the now popular Cradle-to-Cradle approach. I will come back to this later.

By the way, there are several other interpretations of this Triple P. The P of Profit is often exchanged for the P of Prosperity. My colleague and master, Professor Kees Duijvestein, has added the P of Project and regularly you see other fourth P's, such as the P of Process or the P of Politics. However valuable, for now I hold on to the original version. This threesome of P's, Planet, People, and Profit, describes best the way I see my task in the field of Sustainable Housing Transformation.

Transformation
The words Sustainable and Housing have thus been explained. Now the third term of my chair’s title: Transformation. I illustrated this term with the word extensive. Anyone who thinks of an extensive approach of existing houses, without thinking of demolition and rebuilding, usually thinks of stripping. That is what's happening in Delft in the Poptahof at this moment in a very sustainable way [fig. 6].

Stripping is taking everything away till only the construction frames of the houses are left and floor plans can be newly arranged. Such an approach may be well combined with the installation of new techniques. In my chair I will not confine myself to stripping. I think it is possible too, to make extensive changes whilst homes are occupied. At Business University Nyenrode, in the innovation lab renovation building, we have researched how far we can make a house more sustainable without forcing a move. There our students chose an attractive term for this approach: pimping [fig. 7]. My chair will involve both stripping and pimping of the existing housing stock.

fig. 6 'stripping' in the Poptahof in Delft
fig. 7 'pimping'
Source: Innovationlab renovatiebouw Nyenrode
I will encourage this to happen in a manner which is economically sound and which enriches both people and the environment.

I am actually looking for, as the Dutch say, knives that cut at three sides. The sides environment, people and economy. That is difficult but also fun and challenging.

**Challenging**

The first word of the title of this inaugural speech has been spoken again. Also challenging are the goals of the Dutch government, the goals they set in reaction to global climate change. It may amaze you but these goals are extremely ambitious. In 2020 the CO2-emission must be reduced by 30% compared to 1990. In itself that is not a very timid goal, however, as Professor Gerard Keijzers, colleague and coach at Nyenrode, always emphasizes; with the current economical growth the CO2-emission shall, without any restraints, grow with 20%. This means that we’re not striving for a 30% reduction against 1990 but for 50%!

The Dutch government also wishes for 2020 that 20% of the energy used is produced sustainably. At this point in time 2% of our energy is produced sustainably, think of sun and wind. Regarding sustainable energy we therefore speak of ten times as much! The task for Sustainable Housing Transformation is therefore very challenging since a large part of these goals need to be met with the existing housing. Stock Dutch housing is good for 20% of our CO2-emission. [fig. 8]

In the next figure [fig. 9] you will find the current energy use of the houses. The letters refer to the recently introduced Energy Label that gives an indication of the average energy use of the house. Label A is the level for new houses. Houses with label G are energetically the worst houses. Do realize that, on top of that, the number...
of houses built each year comes to only a little over 1% of the 7 million existing ones. Up till 1995 but a few requirements were set for energy-saving measures and therefore a great part of Dutch housing does not meet these criteria. Almost seventy percent of the Dutch housing stock needs extra insulation like insulated floors, insulated roofs, insulated fronts and double glazing.

To make everything even more ambitious: there is an immense time pressure: 2020 is only 12 years from now.

In 1996, 12 years ago, Richard Kraijcek won Wimbledon [fig. 10]. For many of us, that feels as only yesterday. In twelve years time, today will feel as only yesterday, I know that's true for me anyway. But in that time we are meant to have reduced our energy-use by about 50% whilst we use ten times as much sustainably produced energy than we do now. The world must look totally different then. To be able to reach these goals using high-efficient-boilers and insulation is just a first step. In my chair it is all about that first step plus the real transformation, a sustainable transformation. You must understand by now why I have used the word 'challenging'.

Before I elaborate on the second term in the title, valuable, I would like to make a remark. Opting for the goals for 2020 as the basis for my chair does not mean that I will only focus on energy saving. I will also approach other environmental themes such as water, traffic, waste, health and flora and fauna. These themes are all more or less related with the theme energy.
Valuable

Now the term valuable. Here I continue the work of my predecessor Thomsen. The realization that our existing housing stock and neighborhoods are more valuable than most people think, I got thanks to him. In practice existing houses must last much longer than most professionals account for. The calculated economic life span of a house is 50 years. Many people in building and real estate automatically assume a period of 50 years is a realistic lifespan for a home too. In practice however, houses stand much longer. In the Netherlands only 0.25% of existing homes are replaced each year. Based on this information Thomsen has come to the shocking conclusion that existing houses in the Netherlands are expected to last 300 to 400 years [fig. 11]. This is six to eight times the economical life span. Something that is supposed to last so long should be carefully minded and well treated whilst keeping the future in mind. Something that should be carefully minded is valuable. That is my first argument in choosing this word in the title. Another argument is that people find things that exist valuable. Existing housing is different from new housing in the fact that people already live there. These people have come to love their homes and neighborhoods. This love does not disappear as soon as technical and social problems appear. The human factor plays an important role in the approach of housing. Plans for demolition may be met with great resistance [fig. 12]. The fact that people who live in houses become fondly attached to their house and neighborhood, forms a second explanation for my choice of the word valuable.

Summary part 1

I would like to summarize this first part of my inaugural speech:

- The chair Sustainable Housing Transformation addresses sustainable transformation of existing housing and neighborhoods.
- The interests of three parties, people, the environment and the economy need to be attended to.
**Streep door sloop Vreewijk**

ROTTERDAM - De omstreden sloopplannen voor Vreewijk staan nu al op losse schroeven, nu de PvdA verklaart er helemaal niets in te zien. „Wij willen geen tweede Nieuw-Crooswijk in Vreewijk,” stelt raadslid Duco Hoogland.

Twee weken geleden riepen de bewoners in Vreewijk nog op tot massaal verzet tegen de plannen van corporatie ComWonen. Aan de rand van het tuindorp op Zuid, tussen De Bree en Maarland, moeten in 2008 200 sociale huurwoningen tegen de vlakte om plaats te maken voor ouderenflats. Deze woningen zijn volgens de corporatie volstrekt verouderd, wat door de bewoners wordt tegengesproken.

- It involves both stripping and pimping.
- The ambitious 2020-goals are the departure point. This makes the chair very challenging.
- Besides energy other environmental themes will receive attention within this chair.
- As a result of the slow replacement rate of existing housing, in practice houses need to last a long time. On top of that, people have become emotionally attached to these homes. This makes them more valuable than is often thought.

**Part 2: Tackling the task Sustainable Housing Transformation**

The task that I focus on is thus made clear and that brings me to part 2 of this inaugural speech. Here I wish to give you an impression of the ways I think this task should be approached. In my chair I focus on the 2020-goals. Because the time pressure for these goals is great, I especially wish to promote Sustainable Housing Transformation in practice. To begin with I would like to share with you two examples that illustrate how, in my view, in practice the work should be done.
Examples

The first project that I would like to show you is Granville Island in Vancouver [fig. 13, 14]. I encountered this project accidentally during my holidays in Canada, two years ago. The location of this project, beneath viaducts of highways and railways, used to be a garbage dump. Thus it was a terrible place, whilst now it is a bustling heart of the city. With low costs a shopping- and dining-area has been realized that is immensely popular and on top of that quite environmentally friendly.

The whole surroundings have been given a boost by this project.

The greatest thing is that the success is not a fluke chance. The area was redeveloped by the council and several organisations. If it is possible to change a garbage dump beneath viaducts into a bustling neighborhood, it should certainly be possible to make something wonderful of our existing neighborhoods that are currently facing problems. And that this is possible is already being proved in the Netherlands. Since here too, I found an inspirational source.

This is the second project I wish to show you. In the neighborhood Spangen in Rotterdam a transformation is underway that gave me the same feeling as the Vancouver-project. With ups and downs an old neighborhood with problems is slowly turned into a bustling neighborhood [fig. 15, 16, 17]. The Wallisblok, an initiative of architect Ineke Hulshof, plays an important role. This project illustrates that it is possible to realize a sustainable transformation together
with the residents and by using the good qualities of the existing houses. I will not go into the details here but the crux is that the Wallisblok proves that houses that are technically and socially in a deplorable state may be made into beautiful houses at an acceptable price. Houses that fulfill the wishes of the residents. The houses also give the whole area a quality boost. On top of that, the environment was given priority too. The houses reached the high standards of 'green financing'.

**Innovation**

These examples show that a lot of innovation is needed, for products and for processes. I regard innovation to be an important carrier for sustainability. Concerning product innovation; to reach the 2020 goals whilst keeping in mind the triple-P-thought, naturally many new products are needed. This does not only mean new techniques, such as energy saving heating systems or new insulation products, but also new products such as services or financial products. Think of new forms of saving, mortgages and loans. But even more than on product innovations, I will focus on process innovations. A quote by Einstein illustrates that these are of the utmost importance:

‘You cannot solve the problem with the same kind of thinking that has created the problem’.

We must find new ways of thinking. Professionals must lose their customary ways of working. Process innovation must be introduced. That is necessary but not easy. All those involved must expand their view. People must work with other parties than they were used to and a lot of creativity must be put into it.
Only then it may be possible to reach the 2020-goals and come to truly new solutions.

**Cradle-to-Cradle**

A good example of what I mean with innovation is the, earlier briefly mentioned, Cradle-to-Cradle approach by the American architect William McDonough and the German chemist Michael Braungart. At the moment the Netherlands are full of Cradle-to-Cradle activities. McDonough and Braungart have ambitious goals for the environment and they wish to rearrange the way we work vigorously. They focus on closing cycles and on making products biologically degradable. These goals are not in themselves new. For many decades small groups of enthusiastic people have worked on creating products that meet the Cradle-to-Cradle criteria.

The thing that is new, is that McDonough and Braungart have succeeded in connecting this environmentally friendly thinking directly to the business interests of the people involved. Because of this connection they were able to make big parties, such as Ford and Nike, enthusiastic for this totally different way of working. As a result a number of diverse new products have been developed, ranging from carpets to a chair and several buildings. A lot of debating can be done on the technical possibilities of Cradle-to-Cradle thinking in practice, and a lot of debating is being done. But in spite of all the criticism; the power of McDonough and Braungart is that they have succeeded in making large groups of people around the world, think differently and work differently to what they were used to. They have proved that being good for the environment can be done in connection with the direct interests of people and economic interests.

**Innovation diffusion**

Braungart and McDonough have been busy for quite some years with putting their goals into practice. That is difficult but necessary. Because however wonderful your goals are, only when put into practice, they have some value. That is why I strive to translate Sustainable Housing Transformation into practice with as many different parties as possible. I already stressed that a lot of creativity is needed. Therefore it is a pity that so few of the most creative people in building, the designers, are seldom involved with the existing housing stock. I see it as a personal challenge to seduce architects to do so.

To get innovations implemented in practice on a large scale, a process of innovation diffusion must be followed. The American Rogers extensively
researched these processes. After studying the story behind many innovations he concluded that there is a standard process. This you will see in figure 18. First a few front runners, named innovators, bring an innovation into practice at a small scale. When the innovation has proven its value, the tested innovation is put into practice more often, until the time that the majority of people have opted for the innovation. And with that, the process of innovation diffusion comes at an end. As you may see in this figure, some processes cost more time than others. Because there is a time pressure on the 2020 goals the chair focuses on both parts of the innovation diffusion process. On promoting a successful first implementation in practice and on the processes that promote the implementation of the tested innovations at a large scale.

First implementation of innovations in practice
In order to fully run the curve, the innovation must prove its quality with the first users. The first projects that apply the innovations must be successful, otherwise the innovation process will stop there and then and may never be put on the market at a large scale. For the area of Sustainable Housing Transformation this means that the projects that sustainably innovate and transform existing housing areas, must be successful. For you know as well as I do; bad news travels faster than good news. When the residents of the first projects are not happy, this news will soon reach the media and a negative picture will be spread that will be very difficult to change. The current discussion on ventilation systems with heat recovery from ventilation air after a failed application in Amersfoort, is a good example of this.

Of course we can never guarantee the success of a project up front. But we can name some ingredients that greatly enlarge the chance at success. I would like to speak of three of these ingredients with you:
- Enthusiasm
- Made to measure
- Interdisciplinary cooperation

Enthusiasm
I would like to illustrate the ingredient ‘enthusiasm’ with another quote, this time of the American essayist and influential thinker of the 19th century: Ralph Waldo Emerson. He said: ‘Nothing great was ever achieved without enthusiasm’. And of course I knew that, since in all evaluations of successful sustainable building projects in the past I always encountered one very enthusiastic person involved in the project, a person whom often held on to the sustainable ambition, whatsoever the opposition. In these evaluations the chance of success was also greatly increased when an influential party, for example a council member, was enthusiastic about the project and let people know about it too. But it was not till I lived in the USA that I became a true believer in the power of enthusiasm. In Boston, the birth town of Emerson by the way, I came into contact with the Green Round Table. This company had developed the Green Mindset Approach from which they worked. Their approach meant that they would apply themselves to existing enthusiasm. The developers of this method stated that you should not need to try and create enthusiasm for something in the people concerned. It is much more effective to connect existing enthusiasm to a strive for sustainability. In practice this means that you should not need to convince, to ‘preach’, as I had been doing in the Netherlands, but that you should listen carefully and ask the right questions to find out what got the people concerned moving. What makes them enthusiastic? What makes them angry? After that you need to, with sustainability on your mind, find the way to employ this emotion. Working towards sustainability may done in so many ways, there is always a way that aids the solution for an existing problem or the reaching of a goal.
Back in the Netherlands I started working with this approach and work only became more fun. Since helping people is different from pressing something upon them. If you can hook up with what really moves people whilst striving for sustainability, you create a positive mood that benefits everyone. I think that for me, the source of my enthusiasm is a sense of responsibility passed on to me by my father. In Al Gore’s film An inconvenient truth, words are spoken that my father could have said: ‘Imagine that our children and grandchildren are asking us: “What were you thinking? Didn’t you care about the future?” What would our answer be?’ [fig. 19].
Contrary to before, I no longer have any resistance against less idealistic
arguments for working on sustainability. But I still prefer the combination of idealism and pragmatism. A good example of this approach forms the Dutch housing association Oost Flevoland Woondiensten. This housing association directly connects energy saving, lower living costs and socially responsible entrepreneurship on which grounds the director was named national housing cooperation director of 2007.

"Imagine that our children and grandchildren are asking us:

'What were you thinking? Didn't you care about the future?'

What would our answer be?"

**fig. 19 quote of Al Gore, in "An inconvenient truth"**

**Made to measure and interdisciplinary cooperation**

The second ingredient for the success of a project is what I call made to measure. That is even more important for existing housing than for new ones. The art for existing buildings is to keep that which is valuable. I am not out of principle against demolition but I do feel this should only happen on a small scale and only after all other possibilities have been fully explored. Earlier on I told you that 70 percent of the existing housing stock lacks insulation. Dutch policy makers would call that 'low hanging fruit', since with relatively easy measures, much may be gained. On top of that: many houses are comparable [fig. 20].

It seems these houses can therefore all be approached in a similar manner. Unfortunately this proves to be difficult in practice. Houses such as these are, after a long period, no longer similar. The floor plan has changed, parts have been insulated and rooms have been added. The result is that even for taking relatively easy measures, an expert needs to analyze the house first. Also, many homes have not been built in series [fig. 21].

These houses, large or small, are often filled with authentic details that the owners would love to keep. I too live with my family in a house of which there is only
one. For quite some time I have been looking for the optimal combination of living comfort, esthetics and energy saving, and I realize more than ever that made to measure fitting and, let us not forget, craftsmanship, are essential for a good result.

Then the third point: Interdisciplinary cooperation. On the basis of research and my own experience I have become convinced this is very important. In practice this means that with as many parties as possible as early as possible, there should be intense cooperation. Only then it is possible to realize true process innovations.

Research by the Center for Sustainability of Nyenrode University shows that creating new forms of cooperation is one of the most effective ways of reaching ambitious environmental goals. In regard to this I think of parties involved in housing, such as housing associations, building corporations, local governments and installers. But also not so obvious parties such as energy providers, banks, suppliers and businesses focused on ‘living’. Like Ikea for example.

Processes that promote implementation at a large scale
I described the ingredients that aid the success of a project in which innovations are first used. The next step is reaching the masses. To realize this, it is important to first carefully evaluate the results of the first projects. The information thus gained must be well communicated and combined with financial stimuli or stimuli via laws or regulations.

I would like to expand on the use of stimuli, including communication. I have become convinced that the way these stimuli are implemented makes it or breaks it. The right stimuli must be given at the right time to the right people, by the right people in the right way. That may sound logical but in practice, that is not the case. For example: when renovating after buying a new house, it seems the ideal moment to think of taking energy saving measures. However, whether people are open to stimuli towards that at that moment depends on many external influences. Which season it is for example. In summer people are less recipient to information on saving energy than in winter. The budget that is available for the renovation, the available time and all other wishes the people have, may have influenced the effect of stimuli too.
Brad Pitt, Steve Bing Plan New 150-Home Community in New Orleans
by Jason Park Chua, Jersey City, USA on 09-26-07
CULTURE & CELEBRITY

Actor Brad Pitt has just communicated plans to build a new community of homes in New Orleans' Lower Ninth Ward. Announcing the new effort at today's meeting of the City Planning Commission, Pitt will be partnering with real-estate developer and philanthropist Steve Bing to create 150 low-price, sustainable homes as part of Pitt's "Make It Right" project.

fig. 22 Brad Pitt as opinion leader.
Source: www.treehugger.com

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Dissertational
Summarizing this second part of my inaugural speech [fig. 24], let me show you this figure. This is the result of my dissertational research in 2000, which was aimed at the diffusion of environmental innovations in housing. Much of which I have shared with you today, you will find in this figure. You see the product innovation that needs other qualities besides environmental quality. You see the first projects that used innovations. They have a larger chance at success with interdisciplinary cooperation (the overlapping circles) and with the right people involved. I have illustrated the enthusiasm who goes on, in spite of setbacks (the locomotive) and the influential person that stands

Who the messenger is, also plays a part. An energy provider that has all the information in house on saving energy appears to be a doubtful party to many people. Because in the end, their business is selling energy. It seems more effective when well known public figures praise sustainability because people like to copy them. Actor Brad Pitt for example plays that role in the US, while rapper Ali B [fig. 22, 23] is active in this field in the Netherlands. Finally: the effect of the message is also determined by the type of person that receives it. Someone who is focused on saving costs should be told a different story than someone who can afford more and can be convinced by arguments on comfort.

Research of these processes will be one area of focus in my chair.

fig. 23 Ali B, a famous Dutch rapper, as opinion leader.
Source: www.dag.nl
The diffusion of environmental innovations in housing.
Source: Beyond the demonstration project, 2000

behind the project (the star). The evaluations have been conducted similarly which is illustrated by the repetition. Also the way of communication (the megaphone) has been illustrated. You see the positive effect of the influential person that helps pass on the message (the star) and you see that made to measure is important for the diverse target groups (the pawns). You also see the influence of stimuli by the government, such as regulations, subsidies and long term visions, such as the 2020 goals. Finally I would like to point out that this whole model is placed within what I have called external factors. Those are all circumstances that you cannot control but which do have an influence because they may enhance the feeling of urgency. The film by Al Gore is such an external factor. But also rising energy prices and the flood in New Orleans. Hot summers and warm winters influence the feeling that there is really something going on with the climate and they too feed the feeling of urgency. These external factors show the importance of timing. It is of the greatest importance to screen for these factors always and to jump in when it seems opportune.

Summary part 2
When I summarize this second part of my inaugural speech, I come to the following result:
- To reach the 2020 goals much must change. Both product innovations and process innovations are needed.
- Emphasis in this chair lies on process innovations.
- The value of product innovations and process innovations must be proven in practice.
- The chances of success with the first application of innovations in practice increases when projects have the following:
  • Enthusiasm
  • Made to measure
  • Interdisciplinary cooperation
- A large scale implementation of innovations is supported by:
  - Project evaluations
  - Giving the right stimuli, at the right time, to the right people, by the right people in the right way.
- External factors are of great influence and determine the timing of stimuli.

Part 3: Fitting into the TU Delft

In the third and last part of my inaugural speech I would like to show you how I, with colleagues and students, wish to aid fitting Sustainable Housing Transformation into practice. Let me first explain briefly the position of my chair in the rest of this university. The chair Sustainable Housing Transformation is part of the section Housing of the department Real Estate and Housing of the faculty of Architecture of the Delft University of Technology [fig. 25].

The two main goals that I have set myself for the next few years of my chair are:
- To spread knowledge on and enthusiasm for the practice of Sustainable Housing Transformation, both inside and outside of this university
- To further scientifically develop my approach and the model I use.

As I hope to have illustrated in my inaugural speech, I strongly adhere to interdisciplinary cooperation. I hope to attain my goals thanks to such interdisciplinary cooperation. To show you how I imagine that, I split up my chair in three parts: Sustainability, Housing and Transformation.

**Sustainability**

Sustainability is gaining more attention at the faculty of Architecture. The same is true for the rest of the university. My connection to the faculties' research program Sustainability ensures I can work together with colleagues within
other departments and faculties. Within the faculty at the moment, the ties are strong with the departments Building Technology and Urbanism, since I have worked with colleagues there for many years. The ties with the department of Architecture are also strong but in a different manner. Together with the chair Dwelling, that focuses on new housing, I am preparing a double Master Degree program concerning sustainable housing. Students will be able to graduate in two directions, Real Estate and Housing and Architecture. This was never possible. In fact, we may speak of a process innovation.

This university has many faculties. I work together with representatives of other faculties in the Delft Environment Initiative. With one faculty the ties are already very strong. For years now I have worked with Professor Han Brezet of the faculty Industrial Design. Finally, I wish to look further than this university. I combine my work at Delft with my work at Nyenrode and wish to cooperate with other universities too. An international researcher will be added to my team here in June. She will set up an international network around my approach of Sustainable Housing Transformation.

**Housing**

Then Housing. My chair is part of the section Housing. Naturally I work closely with my immediate colleagues. A good relationship is also kept with the research institute OTB. All research done there that has a connection to housing, sustainability and health, and that is a lot of research, has been brought together by my colleague Professor Henk Visscher and I, with the research in my chair. This lead to the research program Home quality (Woonkwaliteit) 2020, in short WK2020. The year refers to the governmental goals. With this widely set up program we try to involve the professionals in the field in our research. Our wish is to do research that actually hooks up to needs in practice. With parties that wish to participate in this research program we aim to create a platform upon which researchers and field professionals can regularly exchange thoughts and together enlarge their knowledge.
Transformation
Finally, the term Transformation refers to the changes I hope that will occur, and concerning my chair, especially in processes. Process innovation plays an important role in my section Real Estate and Housing too so there will be more cooperation within the section as well. On top of that, the term Transformation has been put in a central position at the knowledge centre ®MIT (Modification, Intervention, Transformation) that was founded by Professor Jo Coenen. For this reason, and since this knowledge centre will mainly focus on transformation of existing buildings, there will be cooperation also.

See thus the network of my chair [fig. 26]. I hope to realize my goals in cooperation with all these parties. That I have been enabled to do so I thank to a much larger network than may be seen in this figure. My family, friends and many other colleagues have not been put in to this figure. But it is thanks to the cooperation of the past, with all these people, that I stand here today. I sincerely hope that this 'old' network will mix in the future with my 'new' network thus increasing the chance that Sustainable Housing Transformation will be put into practice more often.

Thank you all.

I have spoken.
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