

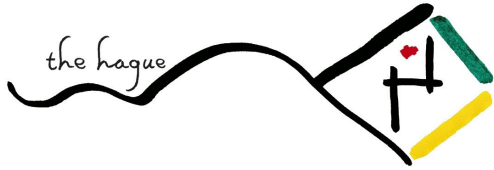
"City-University Partnerships: Best Practices in Urban Sustainability in Europe and the US"

24-26 January 2011, Washington D.C.



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- Project Full retrofit of neighbourhood;
- Project Establishing a local energy company: DEVO;
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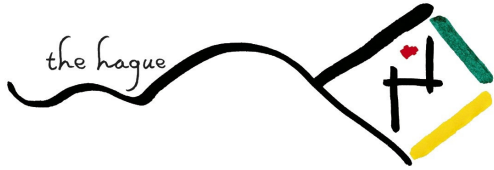
Part III: The Netherlands' delegation:

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Urban sustainability

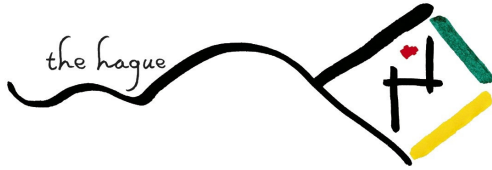
“Part I: From EU to national to local Dutch policies”



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Context for Dutch cities for improving energy efficiency and increasing the use of renewable energy in the built environment

EU's three corner stones for energy & climate policy making (Lisbon Strategy 2005)

- Improving energy security
- Increase Europe's competitiveness
- Combating climate change

EU's Climate & Energy Package (2009)

- The Climate & Energy Package is one of Europe's headline targets for 2020 (Europe 2020), others focusing on employment, R&D, education and poverty/social exclusion
- 20% GHG reduction in 2020 compared to 1990 emission levels
- 20% renewable energy in 2020 as a share of final energy consumption (14% for the Netherlands)
- Both the GHG reduction target and the RES target are binding
- In case of (new) international agreement on combating climate change, Europe is intending to increase the GHG reduction target to -30%

EU's Energy Efficiency Action Plan (2006)

- Europe has a non-binding energy savings target of 20% in 2020, resembling a 14% reduction of primary energy use in 2020 compared to the 2005 level

Status: The EU is not on track in meeting its energy savings target

- Official EU projections show that Europe is not on track in meeting its energy savings target and will achieve only half of it
- For achieving the -20% GHG target, meeting the 14% energy savings target is not needed, i.e. the non-binding energy savings target is more ambitious than the GHG target
- For meeting the possible -30% target, meeting the 14% energy savings target becomes crucial

Relevant EU legislation for improving energy efficiency and increasing the use of renewable energy in cities

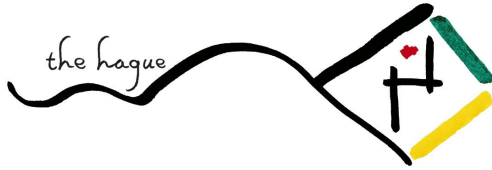
- The Effort Sharing Decision (2009) setting a binding GHG target for the non-ETS including the built environment & transport sector; at the average EU level, the Effort Sharing target does not provide strong incentives for saving energy. The Netherlands have to reduce the non-ETS GHG emissions with 16% in 2020 compared to the 2005 level.
- The Energy Services Directive (2006) setting an indicative energy savings target for EU Member States for the non-ETS sectors and obliging Member States to develop



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energy efficiency actions plans. The Directive also requires an exemplary role of the public sector.

- The Energy Performance of Buildings Directive (2010, recast) setting framework conditions for EU Member States regarding the energy performance of new and existing buildings.
 - From 2019 on, public authorities that occupy and own a new building shall ensure that the building is a nearly zero energy building. By 2021, all new buildings, including those privately owned, will have to be 'nearly zero energy' buildings
 - Energy performance certificates become obligatory for existing buildings
 - Major renovations are subject to energy performance standards
- The Ecodesign Directive (2009, recast) setting minimum energy performance standards for appliances, incl. boilers, various household appliances and lighting
- The Labelling Directive (2009, recast) intending to stimulate consumers to go beyond the ecodesign standards
- The European Energy Star Programme (2006), a voluntary energy labelling programme for office equipment
- The new Renewable Energy Directive (2009) sets an overall binding RES target for member states including a sub target for transport.
 - The Directive does not give a binding RES target for the built environment, although the Directive urges Member States to recommend implementation of RES in the built environment to all relevant actors
 - Electric transport can be used to comply with the RES target for transport

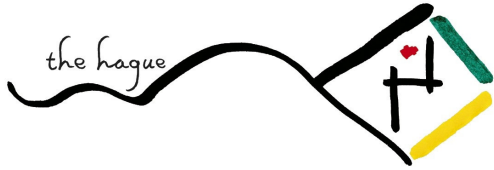
EU funding schemes for promoting energy efficiency and use of renewable energy at local scale

- Europe's R&D framework programme:
 - 2007-2013: €50 billion (part of this money is dedicated to energy)
 - The programme can be used for local/regional government – university cooperation projects
 - Large-scale integration of renewable energy supply and energy efficiency in buildings: eco-buildings
 - Innovative integration of renewable energy supply and energy efficiency in large communities
 - Ensuring sustainable urban mobility, 'European Green Cars' Initiative
- Intelligent Energy for Europe (IEE) programme
 - The 2007-2013 Intelligent Energy - Europe programme forms part of the EU's Competitiveness and Innovation Framework Programme (CIP). Its global budget of €730 million is used to support European projects under annual calls for project proposals. The IEE is looking for creative ideas to achieve the EU's targets for 2020.
 - Focus on dissemination of best practices
 - The programme can be used for local/regional government - university cooperation projects
 - IEE also funds ELENA (**E**uropean **L**ocal **E**nergy **A**ssistance) covering up to 90% of the costs associated with the technical assistance for preparing large sustainable energy investment programmes in cities and regions such as feasibility and market studies, structuring of programmes, business



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- plans, energy audits, preparation for tendering procedures - in short, everything necessary to make cities' and regions' sustainable energy projects ready for EIB (European Investment Bank) funding.
- European Regional Development Fund (ERDF)
 - The ERDF aims to strengthen economic and social cohesion in the European Union by correcting imbalances between its regions. In short, the ERDF finances: direct aid to investments in companies (in particular SMEs) to create sustainable jobs; infrastructures linked notably to research and innovation, telecommunications, environment, energy and transport; financial instruments (capital risk funds, local development funds, etc.) to support regional and local development and to foster cooperation between towns and regions
 - The geothermal project in the Hague is one of the projects that received money from the Fund (via the Dutch programme "Chances for the West")

The Dutch Clean & Efficient programme (2007)

- 30% GHG emission reduction in 2020 compared to 1990
- 20% renewable energy as a share of primary energy in 2020
- 2% energy efficiency improvement annually
- The new Dutch government has moved away from the Clean & Efficient targets and focuses on the binding (and less ambitious) EU targets

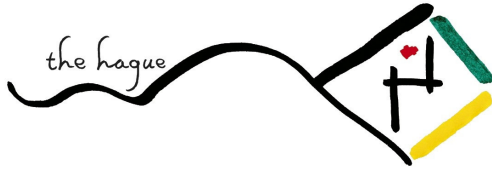
Dutch Energy Transition: towards a sustainable energy supply

- 7 transition themes dealt with in a platform, among them the Platform Built Environment (PEGO) and the Platform Sustainable Mobility (PDM)
- In each platform universities, companies, housing corporations and consultants cooperate
- PEGO aims at:
 - New buildings energy neutral as from 2020
 - 50% reduction of energy use in existing buildings by 2030
 - 80% CO2 reduction in the entire built environment by 2050
- PEGO is involved in the Action Plan "More with less" (see below), the covenant of the local governments with the national government (2007) and the innovation agenda of energy in the built environment (2009)
- Example projects with local governments:
 - 10 thousand electric cars in city of Amsterdam by 2015 to improve local air quality (status 2010: 40 filling stations installed)
 - Bio-gas fuelled busses (various cities)
 - Founding of a local energy company supplying renewable heat and cooling to 1250 houses (city of Veenendaal)
 - Energy retrofit of a large multi-family building in the City of Zwolle also aiming to improve the social living conditions in the neighbourhood.
 - Major renovation of old neighbourhood (336 houses) in the city of Roosendaal to passive energy use performance standards



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Action Plan "More with Less" (2007)

- The associations for the housing cooperatives (Aedes), for energy companies (EnergieNed), for the construction sector (Bouwend Nederland), for the installation sector (UNETO-VNI) and the Energy transition platform for the built environment (PeGO) proposed an action plan "More with Less" for energy savings in the built environment.
- This plan is a comprehensive collection of policy measures to achieve considerable energy savings in the built environment (30% energy savings by 2020 for 5 > 2 million buildings in residential & services sector).
- The plan will be implemented in covenants with the participating organisations. These agreements will formalize the different targets and intentions mentioned in the plan.
- The energy sector and other organizations commit themselves to execute the "More with Less" plan in the period 2008-2020.
- The plan includes pilots to realize energy savings for homeowners and private landlords in combination with a district approach.

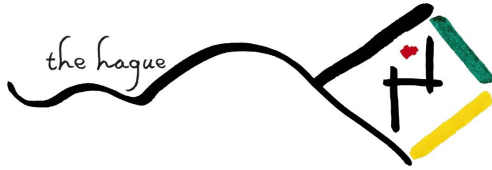
Spring agreement: energy savings in new buildings (2008)

- Covenant between the national government and the building sector to realize energy neutral buildings from 2020 on.
- Subsidy via "Unique Opportunities Ruling":
 - A.O. Geothermal energy project the Hague



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The Hague: Becoming a sustainable city

The Hague and sustainability

The Hague has two main assignments around the subject of sustainability. On the one hand, improving the quality of our everyday environment: the urban assignment. On the other hand, deploying and using our international position to contribute towards global sustainability efforts: our international role.

Urban assignment

Great efforts are needed to preserve the quality of life in The Hague for the future. Important challenges include the rising sea levels, the preservation of flora and fauna, heat and water, and the usage and recycling of raw materials and waste products. The quality of buildings and public spaces plays an important role in this regard. Issues must continually be checked against the People-Planet-Prosperty framework.

International role

The Hague is the International City of Peace and Justice on the world stage. International disputes will more often be related (directly or otherwise) to sustainability. Take for example, the dependence on energy, climate refugees as a result of water shortages, food shortages, etc. Given the international position of The Hague in this regard, it is certainly possible to encourage sustainability on a global scale. The Hague must, of course, set a good example.

Unique opportunities for The Hague

When implementing the above-mentioned tasks, a number of The Hague's special qualities will prove particularly useful. For example:

- its coastal location. Relatively many hours of sunshine, a place for cooling down in the summer and recently, a source of warmth in the winter ;
- the presence of geothermal heat closer to the surface than elsewhere in the Netherlands;
- the almost total lack of heavy industry. The Hague is essentially a green city of homes and offices with the unique feature of also being the seat of government;
- the presence of international institutes, non-governmental organisations (NGOs) and schools which, by dint of peace and justice, are related to sustainability; and
- the presence of a compact district heating network in the city and even a cooling network in the city centre.

What is needed?

Create a driving force and keep it going through pooling priorities and awareness.

The Hague employs the following themes:

Energy: clean, affordable and reliable (investment in wind energy, solar panels, heat and cold storage, biomass, geothermal sources).

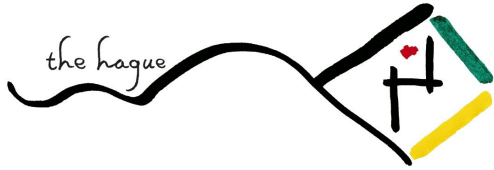
Urban design: sustainable design and new-build. Energy savings in existing houses



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Public space: integrated approach, climate proof, outstanding qualities (people and flora and fauna should be able to feel at home and safe).

Mobility : infrastructural facilities, technical developments and behavioural influence (long term Bicycle programme, traffic circulation plan).

International city: sustainability as International selling point, keeping sustainability high on the agenda of International networks and forums.

Sustainable municipal organisation: role model and sustainable purchasing and contracting.

Setting priorities

The Hague cannot wait for science to come up with “the magic formula”, since that is unlikely to happen. We must and we can get on with the job now. That is why preference is given to flexible or “no regrets” solutions and, at the same time, innovation is encouraged.

The Hague will look for affiliations with existing innovation programmes, or set up its own innovation programme. To do that, collaboration would be sought in the science and education sectors (e.g. the University of Technology, The Hague’s College of Higher Education), as well as other cities (e.g. G4, CO₂ neutral frontrunners) and relevant parties (e.g. energy companies, NGOs, innovative businesses). To remain flexible, a general rule will apply, but every innovation will be assessed as to whether it contributes to the city’s aims sufficiently to win municipal support.

What are the objectives?

The Hague is running out of space; surfaces are forced to be used for an increasing number of functions. Mobility is on the increase while physical space is decreasing, and traffic nuisance must be cut back. Motorists need to be encouraged to rather use public transport and bicycles (modal shift), even if this is only to preserve The Hague’s accessibility. Running parallel to that shift, the problems caused by the remaining motorised traffic must be decreased. Although the problem concerns more than just air pollution, CO₂ emissions and sound pollution, these are the most important points of concern for the coming years (emission-free mobility).

This objective can be achieved through a combination of infrastructural facilities, technical developments and behavioural influence. The city plays various roles in this regard. It is responsible for the infrastructure and, through that, has many possibilities for control. In terms of technology and behaviour, however, we are far more dependent on third parties and our role remains limited to stimulating, facilitating and conditioning. Besides that, the Municipality can exercise control beforehand in the design of the city in terms of mobility by ensuring that functions match seamlessly with one another.

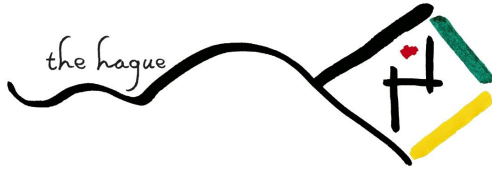
International City theme

International sustainability lobby, sustainability as international selling point



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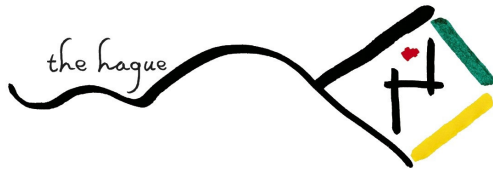
Where are the opportunities to be found?

The Hague is the world's number one City of Peace and Justice. Sustainability is a matter of involvement in similar global issues and a question of civilisation. Increasing amounts of common ground have arisen over the last few years between the dossier concerning peace and justice and dossiers relating to sustainability such as the sharing of natural resources. The Nobel Peace Prize was awarded to Al Gore and the International Panel on Climate Change. It is expected that, in the near future, an important part of the agenda around the promotion of international justice and peace will concern sustainability or rather the lack thereof. Sustainability therefore serves to strengthen the international image of The Hague. The seat of government as well as the presence of, for example, the International Criminal Court and the International Waterhouse makes The Hague an attractive centre for national and international institutes and NGOs involved in sustainability.



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The city of Rotterdam and urban transition management

Dr. Derk Loorbach¹

The Urban Challenge

Major sustainability challenges our Western societies face converge at the level of cities. Problems in the fields of energy, mobility, construction and water management but also education, social cohesion and cultural diversity affect the local scale more than any but also seem to be linked in multiple ways to urbanization. Perhaps not surprisingly, there also seems an increasing sense of urgency and opportunity to address the complex sustainability challenges in an integrated way at the city level. Because the challenges require fundamental changes in the mentioned areas we are in need of alternative approaches to stimulate, facilitate and guide the necessary transitions. In Rotterdam, the Netherlands second largest city with the biggest port of Europe, urban transition strategies have been developed and implemented over the past years in close cooperation between research, policy and business.

Rotterdam

The city of Rotterdam has roughly 650.000 inhabitants and has the third largest port in the world. It faces a number of problems related to sustainability in the broad definition: ecological, economic and social challenges. It is located below sea-level in a delta-area, houses a huge fossil-based industry, and has an ethnically diverse population with relatively low education and employment levels. Over the past years a number of long-term programs have been launched to deal with these challenges. These programs have since their start been transformed into transition programs with high sustainability ambitions, a focus on experimenting and learning, innovative governance strategies and increasing attention to creating public and political movement. DRIFT, an institute for the Erasmus University in Rotterdam, is one of the leading institutes in developing and applying transition management and has been closely involved in the majority of these programs.

Transitions and transition management for sustainability

Since 2001, experiments have been emerging in the Netherlands (and to some extent in other Western European countries) with the approach of transition management. Basically, this approach starts from the conceptualization of structural societal change as a transition: a long-term, multi-level process of change in which distinctive phases of changes can be distinguished. The transition concept, which has been evolving over time, is used to analyse and understand the dynamics of structural change in societal systems. Based on insights in the dynamics of change, transition management offers basic starting point for influencing the speed and direction of such ongoing transitions towards sustainability.

Transitions could take up to two generations to materialize and require concerted efforts that go beyond the time horizon and possibilities of individual organizations or even the

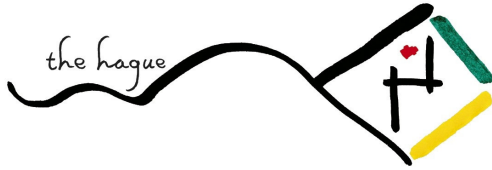
¹ Dutch Research Institute For Transitions (DRIFT), Erasmus University Rotterdam, the Netherlands. Room M5-30, P.O. Box 616, 3000 DR Rotterdam, t: (+31) 010-4088774, f: (+31) 010-4089039, u: www.drift.eur.nl / www.ksinetwork.nl, e: loorbach@fsw.eur.nl



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government alone. To direct transitions towards sustainability, new modes of governance are needed that take into account the long time-horizon, the uncertainties and complexities and the multitude of actors and interests involved. Transition management therefore requires different roles and practices from individual actors involved, such as companies, scientific institutes, governmental organizations or NGO's. Based on complexity theory as well as new forms of governance, Loorbach (2007) and Rotmans (Rotmans and Loorbach 2009) developed a framework for transition management, by which transitions can be influenced and guided. The focus is on systems providing societal needs (mobility, energy, safety, health-care, education and such) and all actors and ecosystems involved in that system. "In essence, transition management is dealing intelligently with ongoing transitions so as to direct them towards sustainable futures", (Loorbach 2007).

Transition management offers some basic concepts, discourse and language to systematically reflect on common complex problems with a diverse group of stakeholders. Key elements in the transition management approach are: frontrunner-networks that develop an integrated understanding of their common transition challenge and a desirable future perspective; a shared transition agenda as roadmap for social innovation; transition experiments as innovation icons to implement parts of the future agenda; and monitoring, evaluation and adaptation. By together developing such activities and constantly deepening the collective understanding of the societal transition the actors are part of, reflexive and strategic capacity is being build-up amongst an evolving network. This over time enables actors to engage in direct competition with existing regime-actors and -networks. On the one hand it is a science based theory that has been empirically tested and refined, on the other hand it offers a practice oriented framework enabling common search- and learning-processes between policy, research, business and civil society.

Urban Transition Management

Urban transitions are long term structural transformation processes in complex urban systems. Over decades, the city itself can go through a transition (for example from industrial to service-based, from rural to urban, from unsustainable to sustainable). Such an urban transition is composed of different transitions at subsystem level (for example in mobility, energy, housing, consumption, or health-care). Urban transition management then is the search for ways to deal in a pro-active way with such semi-autonomous processes, guiding and accelerating social innovation while simultaneously developing new modes of governance and policy-making. Urban transition management comprises the following elements, based on practical experience and the transition management framework in a number of transition programs in the city of Rotterdam, the Netherlands².

- Use of the concept of transitions to conceptualize, analyze and identify ongoing changes towards sustainability in different domains
- Stimulation of multi-actor envisioning and goal formulation on the long-term
- (re)structuring transition scenario's and pathways
- Initiating and up-scaling projects and experiments
- Reflection and evaluation of progress of transitions and (required) changes in governance

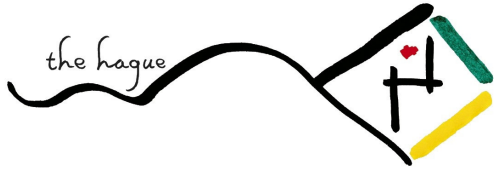
² www.stadshavensrotterdam.nl, www.rotterdamclimateinitiative.nl



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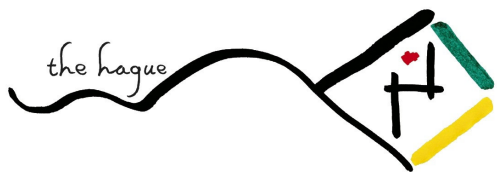
New roles of Research and Policy driving transitions

The described programs and many related activities have been driven largely by interaction and coproduction between frontrunners from business, government and research. In the context of long-term complex societal challenges (such as the transitions in our energy systems, redeveloping large areas but transitions in the societal domains just as well), the huge uncertainties combined with the limitations of existing contexts and interests, require the creation of space for innovation: mental, physical, financial, regulatory and so on. To achieve this, a precondition is a coherent analysis and future perspective that offers a basis for establishing experimental zones and transition arenas. The transition discourse seems to offer the concepts and tools to do so.



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Economic vitality

Economic strength and competitiveness

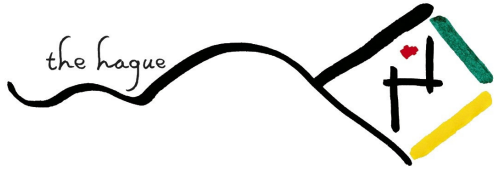
“Part II: Factsheets on projects”



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Becoming a sustainable City The Hague

A summary of 9 significant projects

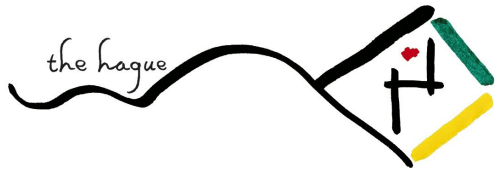
The Municipality of The Hague is currently working on the environmental policy plan 2006-2010 to make the city even more liveable, healthy and safe. This development was partly prompted by European environmental legislation, regionalisation and the planned densification. The approach requires investments in projects that alleviate the environmental pressure in the city. This necessitates linking the various fields of policy and striking a good balance between economic, social, health and environmental interests. This is important not only in terms of spatial planning and urban renewal, but also for our municipality as a "company".



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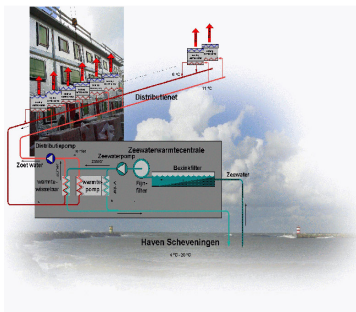
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1. Duindorp Seawater Power Station

Duindorp is situated between the harbour and the dunes in the borough Scheveningen and was established at the beginning of the 20th century. As many homes have since become outdated, the district is to undergo thorough renewal. Some 1,100 houses will be demolished and 790 new homes built. The Municipality, housing corporation Vestia and local residents have expressed support for an energy-neutral neighbourhood. Owing to the district's close proximity to the coast, heat from the sea can be utilised to heat the new homes.

The specially developed seawater power station in the harbour of Scheveningen will extract heat from seawater. Tepid water will flow from the power station through an underground distribution network to the homes. Each home will have its own heat pump, which will further increase the temperature of the water to provide heating and hot tap water. The houses in Duindorp will be equipped with low-temperature underfloor heating. The system will also be able to cool down the homes in summer.



Electricity is needed to power the pumps and compressors in the seawater power station. A wind turbine will be used to generate power locally in Duindorp, which will also remain connected to the regular electricity network in order to either use the power when there is insufficient wind or supply power when the wind is strong and there is a surplus of electricity. This will make the heat supply in the neighbourhood energy neutral.

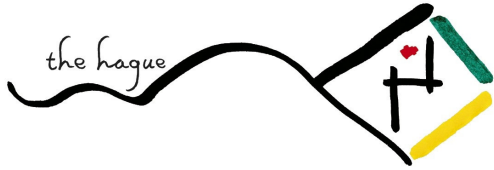
The housing corporation is investing some € 3.000,000 in the seawater power station and the distribution network, while the Municipality of The Hague is contributing € 500,000 in the form of a subsidy.



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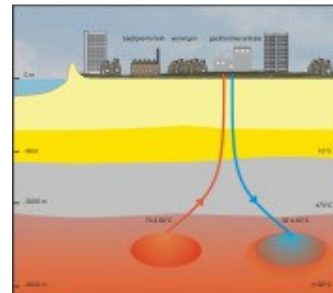
2. Geothermal heating

Four thousand homes in The Hague Zuidwest are to be heated by deep terrestrial heat. The Municipality, energy companies ENECO Energie and E.ON Benelux and housing corporations Haag Wonen, Staedion and Vestia have decided to collaborate on the execution of this geothermal heating project. The use of deep terrestrial heat for a residential district and the joint approach is unique in the Netherlands.

City district receives terrestrial heat

The Hague is opting for geothermal heating because heating from the ground is inexhaustible and it does not cause any emissions of harmful gases. This project will result in a reduction of CO₂ emissions in the area by around 4,000 tonnes a year, which is in keeping with the ambition of The Hague to make the city CO₂ neutral by the middle of the century.

The project requires an investment of € 46.000,000, partly for the installation of the geothermal heating source, but especially to afford the pipelines and other equipment needed to connect the homes to terrestrial heating. Future residents need not fear high energy tariffs, as it has been agreed that their heating costs will never exceed those of residents using natural gas. In fact, the aim is for it to be lower. This project proves that sustainable energy need not be more expensive than fossil fuel.



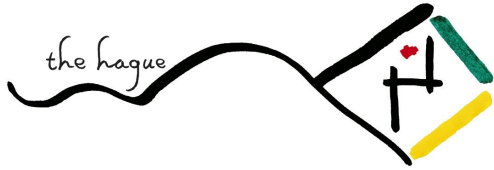
Underfloor heating

Studies have shown that The Hague Zuidwest presents an ideal location to drill for terrestrial heat. The source consists of two wells: one to extract the heat from the soil and the other to collect the water again after cooling. This will take place up to a depth of 2,200 metres in order to pump up water with a temperature of 75 °C. The terrestrial heating will be transported by heat exchangers to the district heating network, from which it will then be carried to the homes. They will have underfloor heating rather than radiators, and that means that the heating will be spread more evenly. It also means that these homes will largely meet the strict standard for energy isolation, the so-called coefficient of performance, which applies to newly built houses.



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3. City district office of Leidschenveen/Ypenburg

It truly works to make sustainability a firm criterion when putting property developments out to tender. This was the conclusion of the Municipality during the development of the multifunctional city district office of Leidschenveen/Ypenburg. After the tendering procedures, sustainability was fleshed out using the Rombo strategy, a process management tool for renewable design.

Technical execution

The result is a building that is sophisticated in terms of architecture and installation technology. The location and the openings in the façade ensure maximum light and heating. The building's air conditioning system uses natural ventilation by means of a double "curtain wall", which can be opened to let in outside air, which is then circulated via the chimney-like duct in the heart of the building.

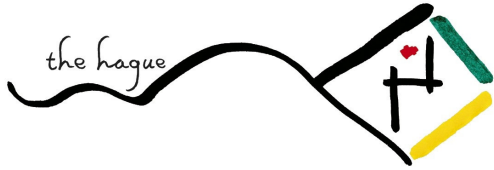


Basic cooling and heating are provided through a water supply system that was built into the concrete core of the building and linked to the underground water storage system. In summer, warm water is stored to be used for heating in the winter and, in winter, cold water is stored for cooling in summer. This allows the building to function without the need for energy from fossil fuels for 85% of the year. Other renewable components include solar boilers, insulation that is less harmful to the environment and special glass that makes optimum use of daylight, thereby reducing the need for artificial lighting. All of these measures make the building's energy consumption remarkably low, and the district office a textbook model of renewable construction in The Hague.



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4. The Hague City Hall

The City Hall complex makes use of a large - underground - energy storage system, where cold water is stored in winter for cooling in summer, and vice versa. The system has a capacity of 3,500 kWh, to which end an aquifer at a depth of 25 - 65 metres below the City Hall is used.

Process

The "cold" source water is pumped from the "cold" repositories in summer and transported to two heat exchangers, where heat transfer results in the water reaching a temperature of about 160 degrees Celsius. The heated water is then pumped into the "warm" repositories. The extracted cool water (temperature approx. 90 degrees Celsius) is used to cool down both the air that is drawn into the room air-conditioning units and the recirculation equipment.



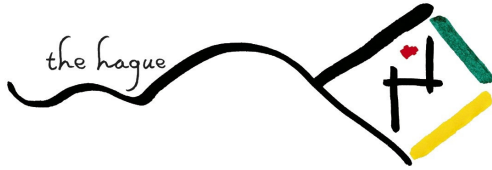
In winter the "warm" source water (above 160 degrees Celsius) is pumped from the "warm" repositories. The air is pre-heated inside the air-conditioning units while the source water is cooled by the outside air. The cooled water with a temperature of about 60 degrees Celsius is then transported to the cold sources via the heat exchanges in the cellar of the City Hall.

Due to the increase in the number of long, hot summers and relatively mild winters in recent years, the system needs to be adapted to the changing climate. A sum of € 3,100.000 will be invested, partly with a view to reduce CO₂ emissions by 250 tons a year.



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5. Coastal Protection around Scheveningen

The climate is changing; the sea level is rising. These changes necessitate a tightening of the safety requirements at the coast. The coast of Scheveningen is not safe enough, and its seawall consequently needs reinforcement. The Municipality also has plans to make the promenade a more attractive recreational venue. The Municipality and the Hoogheemraadschap Delfland (Delfland Water Board) are collaborating on the creation of a promenade that is both safe and attractive. Spanish architect De Sola-Morales was asked to design the new promenade, the construction of which is likely to start at the end of 2009. The total investment amounts to some € 30,000.000.

Weak link

Scheveningen is one of the so-called Weak Links of the Dutch coast. The seawall is not strong enough, according to the current safety requirements. A new dike will be erected to strengthen the weak link. The dike will be built under the promenade to render it invisible. The beach and the seabed below the water level near the coast (front shore) will also be raised.



A wavy coastline

The promenade's design will be characterised by a wavy coastline. The current Strandweg (promenade) runs in a straight line, but the new promenade will follow the curve of the old dunes. This wavy pattern will follow and reinforce the current line of the buildings and dune fronts. The resulting wave shapes will add a playful touch and arouse pedestrians' curiosity as to what lies beyond the bend. The design will also make the Beach, Village and Harbour seem closer together while creating space near the weak point of Keizerstraat for the reinforcement of the seawall.

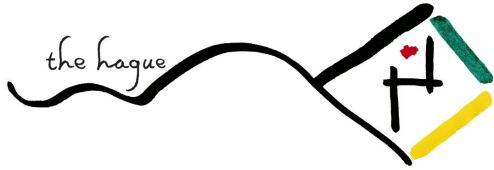
A high and low promenade

The new promenade will be constructed on multiple levels, with a higher urban route along Keizerstraat and a lower route along the beach. The urban route will result in an improved connection between the Boulevard and Keizerstraat. Gradual transitions that are elderly and handicap-friendly will be created between the various levels. The combination of curved coastline and level effect will turn a stroll between the beach and harbour into an attractive experience.



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6. Traffic circulation plan for The Hague city centre

The Hague has great ambitions for its city centre. At the moment, motor vehicle traffic runs through vulnerable parts of the city. This is because this route is often faster than the one via the Inner Ring Road which is specifically intended for through traffic. This has led to the air quality dropping to below the levels allowed along various routes in the city centre.

There are also plans to gradually transform the centre into a continuous area of outstanding spatial quality where pedestrians and cyclists occupy centre stage. Improved links between the various parts of the city centre are needed to achieve this.



The Municipality therefore decided to introduce a City Centre Traffic Circulation Plan to improve air quality in the inner city, expand the car-free zones to make the area more appealing to pedestrians and cyclists, reduce the flow of cars through the city centre while keeping it readily accessible to motor vehicle traffic.

The Traffic Circulation Plan includes an extensive series of measures that are chiefly aimed at immediate intervention in the traffic circulation in the city centre. Strategic parts of the city centre will be made car-free zones and transformed into pedestrian areas.

Circulation on the Inner Ring Road will be improved in an effort to provide the through traffic with a good alternative to the routes running through the city centre. Road signs will also be adapted and a dynamic traffic management system will be introduced to constantly lead the traffic into and through the city.

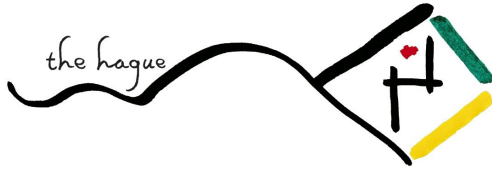
Finally, a feasibility study will be carried out into measures to reinforce the positive effects of the Traffic Circulation Plan: a system of city buses, a city transfer point at Malieveld and a transfer point near Prins Clausplein.

The Traffic Circulation Plan will be launched at the end of 2009 and cost an estimated € 45,000.000.



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7. RandstadRail: First-rate Public Transport

The area between The Hague, Rotterdam and Zoetermeer is urbanising at a rapid pace. Homes and offices are sprouting up in a large number of locations. More and more people want to be able to commute fast and comfortably by public transport between the home, office and recreational venues. RandstadRail became operational in November 2007: a first-rate light-rail system that offers motorists a practical alternative for travelling from the suburbs to the city centre and vice versa.

RandstadRail uses existing lines for the most part, such as the old Zoetermeer Stadslijn (City Line) and the Hofplein line of the Dutch Railways. These existing lines have been adapted and linked to the local tram or metro networks. The Municipalities of The Hague, Rotterdam and Zoetermeer have invested some € 1,000.000.000 in RandstadRail, in collaboration with the Ministry of Transport, Public Works and Water Management.

Growth in passenger numbers

Until 2006, some 17,000 people travelled on the Zoetermeer line every day and 7,000 on the Hofplein line. These numbers are expected to increase to 42,000 and 28,000 respectively in 2010. Linking these lines to the Rotterdam metro network is expected to result in some 47,000 passengers on the metro between The Hague Central Station and Rotterdam every day.



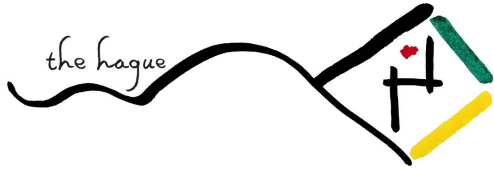
In doing so, RandstadRail will offer the kind of first-rate public transport that passengers demand: frequent, on time, comfortable and reliable. Two types of vehicles are used on the light-rail connections: trams and metros. These vehicles are similar in terms of colour, design, interior, camera security systems and dynamic information for passengers.



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8. Improving the indoor environment at schools

Many schools in the Netherlands have a generally poor indoor environment. In an estimated 80% of the classrooms, the CO₂ concentrations are too high - a sign of insufficient ventilation and poor air quality. A poor indoor environment can lead to health complaints such as headaches, exhaustion and mucous membrane irritation. A poor indoor environment also has a negative effect on learning and teaching performance.

The Hague project

The project entitled "Healthy at school" was launched in The Hague two years ago with the aim of improving the indoor environment at a large number of schools. A key question in that regard was whether it would be possible to develop an effective method to achieve this. At the primary school De Spoorzoeker, complaints were first investigated, then an approach was worked out and finally measures were taken.

The most commonly listed health complaints occurred in both the summer and winter months: fatigue, tired eyes and a runny nose. Temperatures often soared inside the classrooms in summer, and many complained about dry air. In winter, it was often too cold and there were complaints of rapidly fluctuating temperatures and draughts.



Measures related to building and equipment

Insufficient ventilation of the classrooms, especially in terms of poor outflow, turned out to be the greatest problem. The second problem was the frequently high temperatures in the corridors in summer as a result of large glass surfaces and skylights. The heat also seeped into the classrooms through the open doors. It was decided to ventilate the classrooms with the doors closed in summer in order to reduce the high temperatures in the classrooms. Every classroom now has a grid installed above the door and linked to a central mechanical extraction system. A vital requirement for the extraction system was that it should be barely audible in the classrooms, because ventilation systems are often so noisy that users prefer to turn them off.

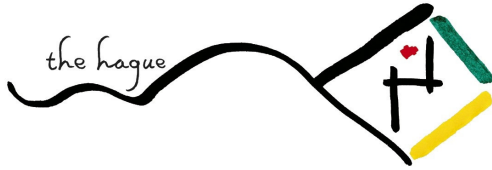
The corridors were fitted with awnings and adjustable hopper windows, to allow cooler temperatures in the corridors in summer than was the case in the past. The inlet facilities in the rooms were not ideal. In order to allow the desired amount of air inside, the window shutters also needed to be opened. Adapting the inlet (by installing more grids or a system to ensure balanced ventilation) would become too expensive. Instead a CO₂ indicator was installed in each classroom. If the air quality is found to be acceptable, then the window shutters may remain closed/partly closed. This prevents draughts and saves energy. The measures were implemented in 2006.



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9. Sustainable building: The Rombo strategy

The Hague implements sustainability through renewable design. To achieve this, the Construction Physics and Construction Ecology department of the Department of Urban Development in The Hague uses the Rombo tool, which stands for Spatial Planning and Environment Policy Design Strategy.

At the start of each new design process, the Rombo strategy underlines the importance of using sustainable techniques wherever possible.

Aim of the Rombo strategy

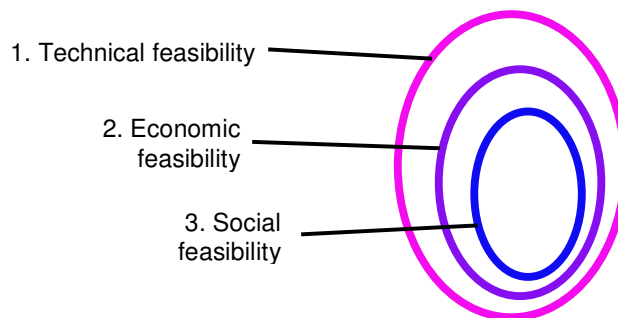
The Rombo is aimed at integrating sustainable building as much as possible in the development of the city. It is specifically geared towards the comprehensive urban renewal ambitions in The Hague. The ultimate goal is: energy-neutral construction, closed local circuits for material, waste and water and a healthy, safe and comfortable environment.

The Rombo process

The strategy is implemented in three consecutive phases:

1. impression forming, where a workshop concentrates exclusively on indicating the technical possibilities for sustainable development.
2. opinion forming, where the promising technical possibilities are explored in terms of measures to be taken to ensure economic feasibility.
3. decision making, the proposal to carry out the remaining possibilities that are both technically and economically feasible and serve the objective in a matter-of-course way. this is the phase when the social feasibility determines which possibilities will also be truly implemented.

This phasing process was not chosen randomly. As a policy, sustainable building is subject to the following three feasibility constraints, from conception to execution:



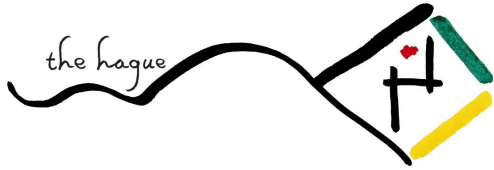
The result

The Municipality has since acquired a number of years' experience with this process tool. The use of this tool in several large-scale regional development projects (several thousands of homes) and a city district office has led to the establishing and realisation of high objectives in terms of sustainability.



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Full retrofit of neighbourhood “Kroeven” in city of Roosendaal

Background

The Kroeven district is a typical Dutch social housing project in the city of Roosendaal, built in 1967. Because of rising energy prices the goal was to keep social housing affordable by reducing energy costs. Earlier renovations in the district were done by Aramis AlleeWonen (social housing corporation) to improve insulation, but never this radical. Three test houses with Passive House quality have already now been renovated. Lessons learned from these 3 houses should ensure a smooth ride for all those involved when in April 2010 the renovation of the other houses will start.

Overall objective

To fully retrofit a neighbourhood of 336 single-family houses. 236 houses are being renovated (according to the passive energy principle) and the remaining 100 houses are replaced by 124 new passive energy houses.

Initiator

Aramis AlleeWonen (social housing corporation)



Before (left-hand) and after (right-hand)

Summary of the innovation

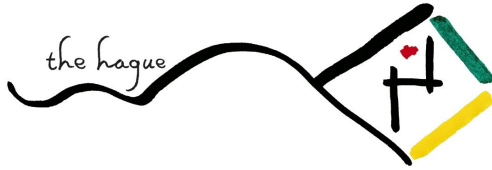
- Insulation underneath the ground floor.
- Single pane glazing replaced by triple pane glazing in Passive House quality frames.
- Complete new roof installed in four sections.
- Walls insulated with 200 mm XPS.
- New ventilation system with heat recovery.
- Optional solar system (2.73 m² collectors + 110 litre storage tank).



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Building services

Before the renovation a typical family in the district uses 1835 m³ of gas per year. After the renovation the average annual consumption will be reduced to 509 m³, a reduction of 1326 m³ per house per year.

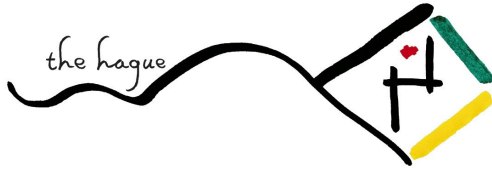
Subsidy:

Unique Opportunity Scheme (initiated by the Energy Transition Platform of the Built Environment (PEGO)).



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Establishing a local energy company: DEVO (Sustainable Energy Veenendaal-Oost)

Background

In the neighbourhood Buurtstede in the city of Veenendaal 1250 single-family houses and 70 thousand m² of services are being developed. For this neighbourhood an ambitious sustainability performance has been chosen for.

Components of energy system

The neighbourhood is served by a collective energy system:

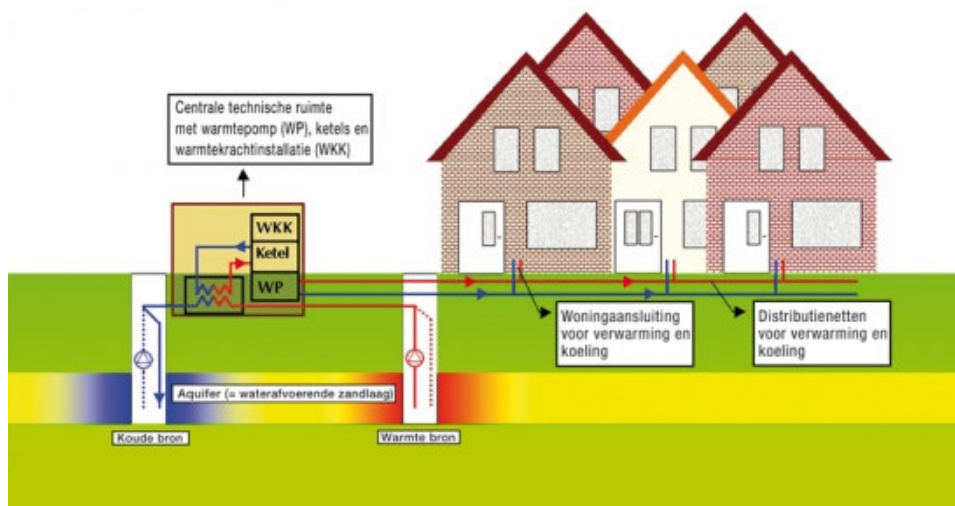
- using seasonal storage combined with heat pumps (space heating/cooling)
- a CHP installation supplying hot tap water
- houses are based on low temperature heating systems

Financial advantages

- DEVO requires a lower internal rate of return (max. 10%)
- O&M costs for gas boilers are avoided
- Green mortgage partly compensates additional investment costs for higher investment costs
- DEVO guarantees a 15% lower energy bill compared to new houses with a gas-fired boiler
- DEVO's profit goes to a revolving fund for funding future initiatives and allow continuity of the energy company

Organisation

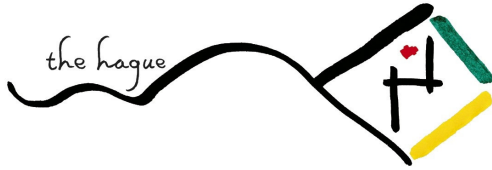
DEVO is a public-private partnership. Shareholders are the local government, development company Veenendaal Oost and Quattro Energie BV (an initiative of a.o. a social housing corporation).



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Rotterdam Climate Initiative

www.rotterdamclimateinitiative.nl

The Rotterdam Climate Initiative is Rotterdam's response to the challenges the Rijnmond region will have to face in the next few decades, and the economic opportunities this entails. The four initiators (The City of Rotterdam, the Port of Rotterdam, Deltalinqs (representation of the corporate sector in Rotterdam) and the DCMR Environmental Protection Agency Rijnmond) join forces with their associates to realize the objectives of the Rotterdam Climate Initiative: to reduce CO₂ emissions by 50% and become 100% climate proof in 2025. The RCI is positioned as a program bringing together all relevant stakeholders in the region around these ambitious targets: government, companies, knowledge institutes, other organizations, and citizens. In the area of adaptation, the Rotterdam Climate Proof program participates in the Rotterdam Climate Initiative, collaborating with knowledge institutes and companies from the water management sector and, of course, the water boards in the Rotterdam region. The Rotterdam Climate Initiative participates in the C40 Climate Leadership Group, a world wide alliance of large cities all over the world collaborating on the issues of climate change. They cooperate closely with the Clinton Climate Initiative, an initiative of the former President of the United States Bill Clinton. In this respect, Rotterdam plays a leading role in the climate change approach of port cities. In this, Rotterdam collaborates closely with cities such as New York, Shanghai, Singapore, Jakarta, Hong Kong, London and New Orleans. This collaboration concerns both adaptation (adjustment to climate change) and mitigation (reduction of CO₂ emissions).

50% reduction of CO₂ emissions

Rotterdam will reduce the emissions of CO₂ by targeting the following cornerstones:

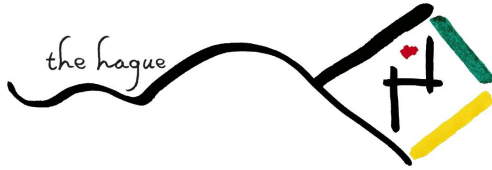
- Rotterdam – sustainable city: by 2025, the emission of CO₂ of all homes and buildings in the city should be reduced by at least 50%. We can achieve this by saving energy and applying sustainable energy, including the heating of 50,000 homes by means of residual heat from refuse incinerators.
- Rotterdam – energy port: over 85% of CO₂ emissions in Rotterdam is attributable to industry. For this reason, we aim to realize an energy efficient port and industry cluster of exceptional international stature. Rotterdam should become the energy port for low-CO₂ energy sources and products. Collaboration with logistics and industry is indispensable in this respect.
- Rotterdam – sustainable traffic and transport: cleaner fuels and alternative vehicles will result in cleaner air. We promote sustainable transport by road as well as by water. The City of Rotterdam serves as an example in this respect where its investment policy is concerned. The Mayor and Aldermen, for instance, have already switched to flexifuel official cars.
- Rotterdam – Energizing City: a clean and sustainable city of Rotterdam can only be achieved if we tackle this goal together with citizens, companies and organizations. This is why we have environmental education programs in schools, an energy conservation program for companies, and publicity campaigns to persuade citizens to adopt new ways of responding to the climate change issue.
- Rotterdam – Innovation Lab: Rotterdam welcomes innovative initiatives and supports their implementation, so that we can take up a leading position in energy knowledge and developments.



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100% climate proof

'Rotterdam Climate Proof' endeavors to make the city climate proof through the following key aims:

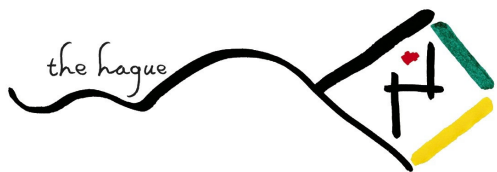
- Flood safety: the Rotterdam delta is safe and should remain safe, regardless of changing climate conditions. Together with our partners we will therefore ensure, for instance, that all water defenses will be sufficiently strong by 2025.
- Accessibility: if water is assigned a more significant role in spatial planning (for instance through floating homes and offices), transport should respond to this development. Our aim is to realize a climate change resilient transport infrastructure for both the city and the port.
- Adaptive building: in the Rotterdam region, we have a lot of knowledge on climate proof and flood-proof building. By 2025, the existing areas outside the levees (including the waterfront and port area) will be flood-proof, and new construction will be restricted to adaptive building. Part of the area called 'Stadshavengebied' will consist of floating districts.
- Urban water system: climate change can lead to extreme precipitation in short periods of time. To avoid situations where heavy rainfalls cause the peak surface water runoff to exceed the capacity of the surface water drainage system, the excess rainwater needs to be retained in reservoirs (water storage). In times of drought, on the other hand, it is important to safeguard the freshwater supply.
- City climate: the physical climate in the city is pivotal in people's assessment of its attractiveness. Our aim is to improve the living environment in the city by means of shaded and cool public areas and climate proof parks and green spaces such as green roofs.



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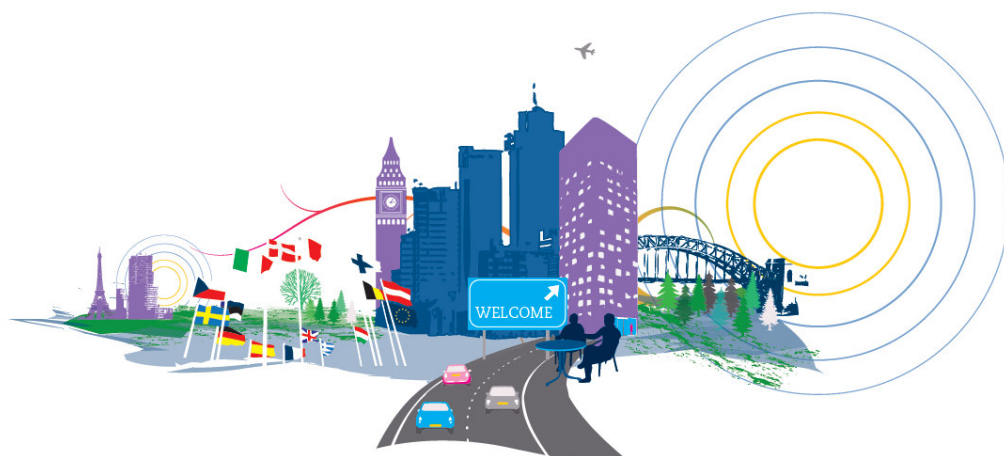


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Polycentricity

Future of the polycentric metropolitan area

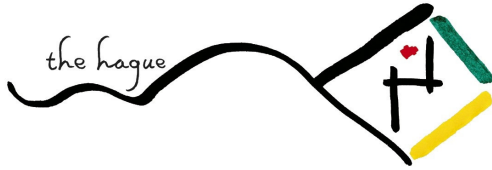
“Part III: The Netherlands’ delegation”



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Professor **Wim Hafkamp** (1953) is an environmental economist, with 25+ years of experience in research, policy and practice, on issues ranging from environmental management in industry, waste management and safety to sustainable development. In recent years he has been involved in urban development, infrastructure and transportation. He worked at the University of Amsterdam, the Free University, Tilburg University and Erasmus University Rotterdam, and was visiting professor at Boston University, MIT and RMIT in Melbourne.



Presently he is the scientific director of the European Metropolitan network Institute (EMI), a newly established European institute guided by the principle "research based – practice led" with a mission to reinforce the economic and social strength of European urban areas by means of innovative knowledge. EMI's activities are dedicated to accelerating cross-border innovation and learning processes focused on urban issues. EMI interconnects urban regions, European and national organizations, governments and academic knowledge institutions around concrete, relevant questions. Wim Hafkamp is also the scientific director of the Dutch Nicis Institute, an institute that generates innovative knowledge on persistent urban problematiques. Simultaneously, he continues as professor of environmental sciences at Erasmus University, where he is involved in the International Ph.D. Program on Sustainable Development, Cleaner Production and Industrial Ecology. He is a member of the Economic Development Board Rotterdam and active in the Rotterdam Climate Initiative.

Hafkamp served as dean of the Faculty of Social Science at the Erasmus University Rotterdam (2001-2006). This faculty includes the departments of Public Administration, Environmental Sciences, Psychology and Sociology. During this period the faculty established the Center for Public Innovation, focusing on 'double innovations' in ICT and public administration.

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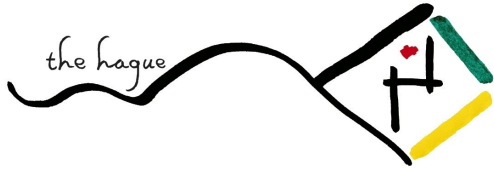
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Robert Harmsen (PhD) is assistant professor at Utrecht University. Robert is an expert in energy efficiency and renewable energy policies. After finishing his PhD on the development of coal gasification in 2000, Robert worked for COGEN the Dutch CHP association the Netherlands Energy Research Centre (ECN) and Ecofys Netherlands, a consultancy firm with a strong focus on energy efficiency and renewable energy. He has a strong background in energy policy evaluation and energy savings and renewable energy potential studies. He has led a potential study for renewable heat and cooling in the Dutch built environment, laying the foundation of the current Dutch renewable heat policy programme. In the previous years, Robert supported the Dutch provinces in translating/linking the national energy targets into regional ambitions. He initiated a potential study on air/water heat pumps for existing buildings for a consortium of heat pump manufacturers. Recently he was lead author of a project for the European Climate Foundation to analyse the policy gap for meeting Europe's 2020 energy savings target and to explore design options for binding energy savings targets.



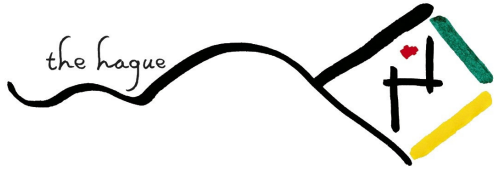
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Hilde Eleveld is Manager Construction and Housing Business for the Municipality of The Hague, and Director of The Hague Heating, a participant in Geothermal Heat.

The Construction and Housing Business sector is responsible for policy and practice in the areas of maintenance, amenities, residential problems, securing and improving the quality of the existing housing supply, granting subsidies for property maintenance, roof and floor insulation and green roofs. Home owners are given support in maintaining and making their homes energy efficient. Should they not adhere to the rules for maintaining and making proper use of their homes, they are given notice for arrears of maintenance.



Hilde Eleveld previously worked for three years as a spokesperson and adviser to the Deputy Mayor of Urban Development.

Between 1996 and 2001 she lived in Vienna VA, USA, where she worked as a freelance writer and journalist for the Dutch media. She was a co-author of the book Clinton's Demons. In addition, she worked as a freelancer for U.S. companies that maintained a business relationship with the Netherlands and Belgium.

Before she moved to the USA, Hilde Eleveld lived in Amsterdam where she worked as Head of Communications at a community college. Hilde Eleveld has an MBA in sociology and an extensive track record as journalist, trainer and consultant in communications and organizational development – an extensive service record.

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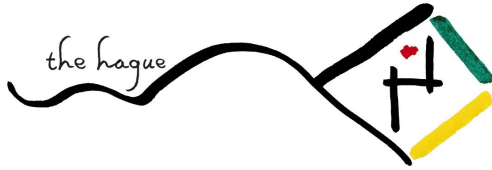
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Derk Loorbach started his professional career working as researcher for the International Centre for Integrative Studies (ICIS), Maastricht University. In 2004, Derk moved to Rotterdam with prof. Jan Rotmans to set up the Dutch Research Institute for Transitions (Drift) at the Erasmus University Rotterdam. He received his PhD in June 2007 and became director in January 2011. Drift is a pioneering interdisciplinary institute that combines cutting edge research with close cooperation with policy and business to further sustainable development in practice. Central theme in Derks research is the development and implementation of an integrated framework for transition management, especially in the context of urban transitions. Transition management is a new governance-concept based on complex systems' thinking aiming to facilitate and direct processes of societal change in the direction of sustainability. It has been experimentally developed in practice as a form of participatory governance in which envisioning, scenario-development, shared agenda-setting and experimenting are basic elements. The iterative development of theory, experimental implementation and refinement can be considered as an example of a new form of research labeled 'sustainability science'. Derk has been leading and participating in various transition arenas, innovation programs and envisioning practices; as researcher, process designer/facilitator and participant. His main theoretical focus is shifting towards urban transitions and urban transition management, focusing on issues related to energy and climate, construction, social sustainability, policy transition and self-organisation.



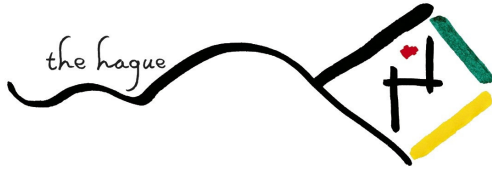
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Hester Menninga is Director of the newly-established European Metropolitan network Institute (EMI). EMI is a hub for knowledge and innovation management of European cities and metropolitan areas, with a mission to enhance the social and economic strength of cities and metropolitan areas through innovative knowledge. Hester is also the Vice Executive Director of the Management Board of the European Joint Programme Initiative on Urban Europe. A programme of the European member states that has the ambition to rethink and manage the increasing urban orientation and concentration in Europe in order to create and exploit synergy in an urbanized Europe, from an economic, social, environmental and transport-related perspective, leading to a strengthened global position of Europe.



In her previous position, Hester was Deputy Secretary-General of the Dutch Senate. She also worked as an advisor to the President of the Parliamentary Assembly of the Council of Europe. During her studies, in her publications and in her professional work, Hester has always been involved in international relations, and especially in European affairs.

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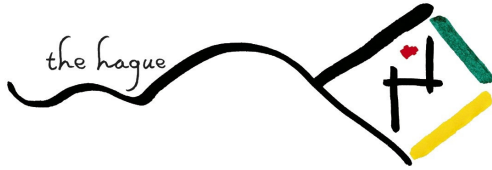
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