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measures in the European renovation market
(NeZeR)**

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Action Plan for the City of Rotterdam

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PREFACE

Carrying out this work package was rather challenging starting with trying to grasp the original idea behind this work package. The idea here is not only to write a solid city action plan for the city of Rotterdam but in parallel to find out and understand the logics for building up such a city action plan using the Guidelines provided by the city of Stockholm. The final aim should be to support other cities on their process of (re)thinking of and planning energy efficiency measures for their cities. While using the Guideline we were able to give feedback on the method so it would improve and was tested in real situations. Herewith the Guideline is useful for other cities. In that way, carrying out this work was for us unusual and intriguing.

In the process of writing this report, we had internally discussion altogether. During the various experts group sessions in Rotterdam, it was good to know that we mainly shared the same views and that we were keen on telling our knowledge and experiences. Therefore we would like to acknowledge our colleagues of Rotterdam Sustainability programme and more especially those responsible for the actions of Acceleration 010 (Versnelling 010). This has clearly strengthened our cooperation.

Furthermore, we would like to acknowledge work package leaders Birgitta Govén and Örjan Lönngren of the city of Stockholm for their patience and open minded attitude and for having supported and guided us all the way of the process of thinking about the relevant aspects of a city action plan. This during nearly one year time. We had good discussion during our meetings and telephone calls with all the participants of the City Action Plan work package. We would also like to thank Pauline Sparenburg of the City of Amersfoort.

City of Rotterdam

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Oubbol Oung

1 BACKGROUND

Base information

The city of Rotterdam has in 2013 around 299.000 dwellings where 616.000 people live in. Besides this, there is 5,5 million m² floor space for companies, 5,4 million m² for offices and 2,1 million m² for shops [Navigator Werklocaties 2013-2023, City of Rotterdam]. All the buildings together use 6.600 GWh for heating [Warmtekoelvoorziening 2030].

A dwelling consists of 79 m² living area on average. The share of housing association dwellings is high: 45 % of the dwellings belongs to a housing association. Together they consume 42 % of the total city gas consumption: 169 million m³ natural gas. In total the dwellings have a heating demand of 3.400 GWh.

The energy consumption per household/ dwelling is in 2013: 2.620 kWh/year on electricity and 1.139 m³ natural gas (10023 kWh/year) [Stedin].

Together all the households produce 1,2 Mton of CO₂ per year. That is 51 kg/m² dwelling per year.

Energy savings

The energy saving potential in Rotterdam is high. The most promising areas are in post-war areas, such as Hoogvliet and IJsselmonde (green areas in the map below). But even in the neighbourhoods surrounding the center and around the focus areas of Rotterdam South ('National Programme Rotterdam-South' NPRZ), which need to be developed economically and socially, is a substantial savings potential available.

The average annual energy consumption of households in Rotterdam is 1139 cubic meters of gas and 2620 kilowatt hours of electricity. This includes all the household related energy demand. The average energy bill is approximately € 120 per month (figures of 2013). A recent studyⁱ shows that Rotterdam households could potentially save more than 40% on their energy consumption. Roughly estimated Rotterdam households could then in total potentially save annually around € 180 million on their energy bills (gas and electricity), which is in average about € 50 per household per month (figures of 2013). Energy expenses are an important part of the housing costs. The actual energy costs and savings may vary by street and individual differences; partly depending on the type of property, measures already taken, the family composition and not least, the behaviour of the residents, see Figure 1.

The retrofitting/renovation of 10,000 homes in the period up to 2018 means a potential investment of €30 million to over €150 million. Based on calculations from the National Energy Accord (2013). For Rotterdam this means 50 to 100 jobs and apprenticeships each year.

ⁱ Report 'Woonlasten in de regio Rotterdam, inzoomen op betaalbaarheid' by Regio Research en Advies'; 18 november 2014;
<http://woonlastenatlasrotterdam.nl/wp-content/uploads/2015/01/20141118-Betaalbaarheid-regio-Rotterdam.pdf>

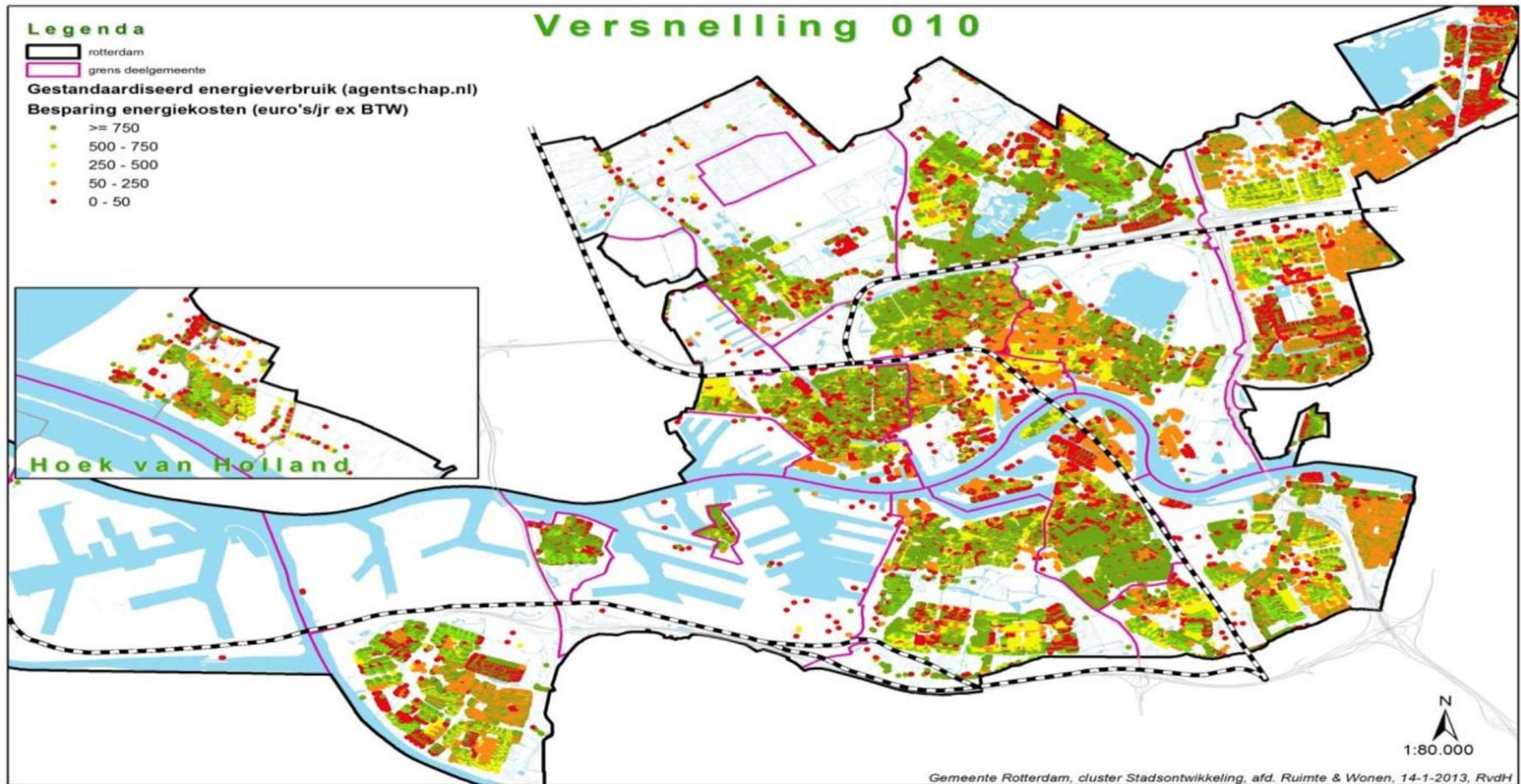


Figure 1 Map of energy use and energy savings potentials in Rotterdam in 2013

Renewable energy sources

In addition to energy savings lie in Rotterdam good opportunities for using waste heat and for the production of renewable energy. Rotterdam has a newly working district heating RDH produced from waste incineration from the waste processing Company AVR located in the harbour of Rotterdam. The goal is to have 150,000 existing homes in 2030 connected to the Rotterdam DH.

Solar energy provides residents and businesses with opportunities to significantly reduce their electricity bills. This mainly due to the 14.5 km² of flat roofs of homes, businesses, schools, and like, which is 70% of the total roof surface in the city.

In the current technique of the solar panels, the sun potential for the city (excl. harbour) is approximately 1,500-2,000 GWh/yr. The sun part is about 60-80% of the total electricity needs of the city (excl. harbour) cover (2.500 GWh / yr, 2013 figures). The aim of the city is a total solar yield of 20 GWh in 2018, which will involve about 10,000 roofs with 6 solar panels each and/or in combination with a commercial and collective solar projects. In 2014, there were a number of 2,300 homes with solar panels.

Rising cooling demand

Due to e.g. climate change, insulation of buildings and internal heat production in dwellings, the demand for cooling is rising. In the Rotterdam city centre the temperature during hot summer days is around 8 degrees higher than the surroundings of the city. This is caused by heat building up on hot sunny days which is accumulated in the dark coloured pavement and other building materials. This effect, Heat Island Effect or heat-stress, has more attention in the Rotterdam Climate Adaptation programme. The total cooling demand for the buildings in the city are relatively low: 1,5 % of the heating demand (2012). In 2030 this will be 5 %, or 200 GWh based on rough figures [Warmtekuidevoorziening 2030]. The spreading of the cooling demand is very different, for the city centre and Stadshavens area this can rise to 25% of the heating demand.

Situation analysis: Ample prove of opportunities for savings

The success rate appears different for areas, type of housing and (financial) capacity and initiative of the residents. Broadening the network of parties appears important to the Rotterdam resident to actually get moving. Personal communication, especially at the community level is essential, as shown by the deployment of the renovation coach (verbetercoach) Molièrebuurt.

Importance of energy savings and renewable energy production

Apart from the economic point of view, there are other reasons why energy reduction and renewable energy production (RES) are important.

Probably the most important one is the climate change effect caused by the emission of greenhouse gas CO₂. Rotterdam is one of the C40 cities worldwide which adopted the Clinton Climate Initiative. The goal was to reduce CO₂ emissions by 50% in 2025

compared to 1997. In the new Sustainability Programme 2015-2018 (Programma Duurzaam) this CO₂ goal has been replaced by energy related goals, such as energy reduction and production of sustainable energy.

Another important reason is the political willingness and urgency to be independent of dictatorial and instable countries. Reason is not only from a social point of view but also to ensure a reliable and robust energy system.

Rotterdam has a problem with air quality, which is mainly traffic and industry related. But also gas fired boilers emit NO_x gasses. So switching to a sustainable energy production will improve the air quality, although the effect will be small. The effect from industry and traffic is far dominant.

The city centre suffers from the Heat Island Effect. This means that the temperature in summer can be 8 degrees higher in the city than outside the city. Making buildings more energy efficient will cause the cooling demand in summer to drop, which has a direct effect on the outside air temperature: it saves on air-conditioning systems that emit hot air.

2 CONDITIONS

Economy

Choosing the right way to calculate profitability is of course of big importance. Not only there are different ways, such as lifecycle costing (LCC) and investment costing (straight payback time method), there is also a number of parameters that are influencing the profitability a lot. These are e.g. the interest rate, the length of the lifecycle, change of energy prices, etcetera. These preconditions should be chosen carefully. As an example, in Rotterdam we changed a bad business case for energy neutral area development into a profitable one by changing the length of the lifecycle from 15 to 30 years and changing the energy price rise from 3% to 6% per year. Normally private energy advisory agencies use in their business cases life cycles of around 15 years and energy price rises of around 3% per year. This is to minimize the risks and to apply to the wishes of the private building sector. A city however can use different values since they don't need to have a commercial payback time of e.g. 5 years and can take more financial risks. Looking at the past in the Netherlands the average price rise of energy has been around 8% per year for the last 15 years. Calculating with only 3% would imply a different trend than the past, but this is not foreseen.

Another parameter that's important for good and fair profitability calculations, is the choice of which interest rate will be used in the calculations. Since municipalities are known for their financial stability, they can borrow at a lower interest rate compared to the private sector. This lower interest rate can influence the business case a lot.

In Rotterdam we think the lifecycle costing (LCC) is essential to implement nearly zero building renovations. LCC takes also care of maintenance costs and energy costs over the lifecycle. Without this, a profitable business case is impossible for this kind of projects. Even with this LCC method it's still very hard. It's therefore important to use the Cost Benefit Analysis (CBA) method, where not only direct financial aspects are taken into account, but also the raise of welfare.

It's important to distinguish between renovations which have primarily energy improvement as a driver and renovations which are done because of a bad maintenance or bad structural state. The last one is a lot easier, because most costs are for structural changes, and energy improvement-costs don't push hard on the total budget.

The problem lies within the building owners which are not looking forward further than 5 years. These are the more elderly people and the private home owners. The elderly people think often that it will last their time (which of course can be true and logic) and the private home owners move to another building every 7 years on average in the Netherlands. So these two target groups are often only looking at the investment costs.

The above clarifies that it's sometimes not enough to distinguish between different ownership structures. Within a segment it can be wise to look also for economic and social differences. Since housing costs are relatively high in the Netherlands, a number of target groups spends almost all their income in buying or renting a house, energy efficiency is

then for them out of scope from an economic point of view since they cannot invest. These people suffer most of the times from energy poverty, an indicator for the percentage of income spent on energy costs.

In Rotterdam we are experimenting with new business models, such as ESCO and revolving funds with a longer exploitation period.

Ownership structures

In Rotterdam we distinguish the following ownership structures:

1. Individual private owners
 - a. Low income, normal age. These owners often live in houses with a bad energy label and high energy costs. Often suffering from energy poverty. They can decide which measures to take, but their investment possibilities are very limited. The building is often not well maintained and energy is not an important driver as they see it. From a city point of view these people are hard to reach.
 - b. Investment possibilities, old people. These owners also live in houses with a bad energy label, but with often low energy costs due to their behaviour. They can decide which measures to take and they have money to invest. The building is often well maintained, but not from an energy point of view. Since their energy bill is often not that high, taking energy measures is often not profitable. Sometimes they have one or two local gas fired stoves for local heating, so not the whole building is heated, the comfort is relatively low. Apart from this, these people are not looking ahead more than 5 years due to their age. From a city point of view these people are hard to reach.
 - c. Mid/high income, normal age. They also live often in buildings with a poor energy label, but they have often a high energy consumption. They can decide which measures to take and they have some money to invest. The building is often well maintained, but not from an energy point of view. The comfort level is acceptable. Energy efficiency improvement is for some part of their interest, but since they change houses quite often, they look ahead for around 5 years. From a city point of view these people are hard to reach.
2. Social housing association
 - a. Tenants with a low income. Due to regulations in the Netherlands a social housing association is not allowed to raise the rent if the energy performance is better after energy-measures. This is only allowed if the measures are improving the building quality and if the measures are for maintenance which is overdue. Regular maintenance cannot cause a raise of rent. Some parties are creative with the definition (what's in a name...) for this reason. Housing associations are interested in measures that improve the building quality and reduce maintenance. They use therefore often the LCC method and can look further in front and take measures with longer payback times. Due to new regulations they are obliged to pay for the energy losses in the building in the collective infrastructure. A tenant only pays for the energy that flows into the home. This is for a number of housing associations reason to get rid of the collective gas fired boiler and install gas fired boilers in every home. This also applies for district heating systems, which are quite common in Rotterdam. There is a programmeto

stimulate housing associations to connect with an existing building to the district heating from waste incineration.

The building is often well maintained, also from an energy point of view, the comfort level is high. Since most social houses buildings in Rotterdam are apartment buildings, the individual energy consumption per apartment is relatively low. A recent study done in Rotterdam showed that on average people with a low income only can save 30,- euro's per month on the energy bill. This gives a poor business case, even with LCC.

In Rotterdam there is a covenant between most social housing associations which states that they must achieve 3% on energy savings per year for their average building stock. From a city point of view these associations are good to reach.

3. Public owner

- a. Buildings owned by the city of Rotterdam. These buildings are often well maintained but energy consumption is often quite high. Not only because of the relatively bad energy labels, but also due to lack of energy management and monitoring. Recently Rotterdam started a programme to improve this. For 9 swimming pools in Rotterdam there has been a new way of challenging the market by helping to improve the energy consumption and health conditions. This is done with a special ESCO construction including the guarantee that there will be more than 30% on energy reduction. The maintenance costs should be at least 15% lower. The contract is for a period of 10 years. Other city owned buildings will follow.

4. Commercial owner

- a. Often it's commercial real estate which is rented to businesses and companies. For new buildings the energy labels are good and sometimes above national energy legislation. A good energy labelled building has most of the times a better rental position and therefore a higher value. For older buildings, it's worse. Since the energy bill is paid by the tenant, there is no direct driver for the commercial real estate owner to take energy measures. From a city point of view these owners are hard to reach.

5. Private (association of owners) and social housing company owned (mixed).

- a. Most home owner-associations, HOA's, are apartment buildings with a number of units. In the Netherlands, the association owns the building. Each apartment owner is automatically member of the association and pays formally occupancy rights (the actual price of an apartment). The rule of decision is based on the majority of votes. The steering committee takes care of the management, including maintenance of the building. The steering committee and the members gather at least once a year and votes on different topics e.g. measures that have to be taken.
- b. The last decade, a lot of apartment buildings in Rotterdam have mixed ownerships. Originally the building and its apartments were owned by social housing companies. As a solution to a difficult economical situation, some social housing companies opted to sell apartment units. This makes it hard to take energy related measures. The rate for decision making for a mixed association of owners is quite high. At least 70% of the members of

the mixed owners association have to give permission for the measures to be taken. This makes it difficult for the social housing companies to take collective measures for the whole building. The energy performance is varying per building and depends on willingness of the association of owners and of social housing companies to cooperate.

Regulations

On a city scale, there are only few regulations. Most important is the obligation to connect to a public (district) heating network for all new buildings. Existing buildings are motivated to connect also. Big renovations with more than 25% of the floor space being renovated, are also obliged to connect.

In the Netherlands it's forbidden for a municipality to set a higher energy performance for a local development than the building code on national level (Bouwbesluit). There are exceptions made for special areas that are called "areas of excellence".

The city has no other mandate than the local building code (Bouwverordening). So a lot has to come from stimulating parties to act. Most important programs on this topic are in Rotterdam:

- Acceleration010 (Versnelling010),
- The National Programme Rotterdam South (Nationaal Programma Rotterdam Zuid),
- Neighbourhoods with opportunities (Kansrijke Wijken) and
- House improvement private owners (Woningverbetering Particuliere Woningvoorraad).

All these programs make each other stronger and try to make the chances better for attractive, sustainable, future proof and payable living circumstances in Rotterdam.

For the buildings owned by the municipality, there has been made an analysis of energy measures with a payback time of at most 15 years. These buildings are then on the short list to be improved.

Rotterdam goals are: in 2030 more sustainable energy is produced than consumed in the city. Harbour and city are connected and residual heat delivers space heating and cooling for at least half of the houses and buildings. Energy reduction and sustainable energy production with solar and wind will cause the energy bill to be lower in 2030 than without this sustainable energy transition.

On national scale, there is the national building code (Bouwbesluit). There is not a specific rule for improving energy performance for existing buildings. There has been set some goals for lowering the energy consumption. Most important is the target to reduce CO₂ emissions with 80-95% in 2050. There should be an energy consumption reduction of 1,5% per year. And in 2020 at least 14% of the energy should be produced sustainable. All this is in general, but includes buildings.

On European scale, there is the EPBD, the Energy Performance of Buildings Directive. This code focuses on new buildings and sets energy targets. The above mentioned goals on national scale are also communicated with the EU.

Other arrangements

In the Netherlands, it can be distinguished between the network –owners which own and is responsible for security of delivery and maintenance and the energy companies supply energy.

In Rotterdam, the network-owner of electricity and gas is Stedin. The electricity and gas energy delivery markets are not regulated. Energy bills of electricity and gas are sent centrally by one energy company to their clients. The reading of the energy used on a meter is carried out by a network owner.

Warmtebedrijf Rotterdam is the owner of the transport network for heating. Two energy companies, Eneco and Nuon Vattenfall, are given each a concession to make new connections to the heat/cold distribution networks. These energy companies take care of the readings of the heat/cold used and send bills to their clients.

Energy prices are onder supervision of the Authority of Consumers and Market ACM (autoriteit consumenten en markt). There are different types of rate as defined by the ACM:

- The delivery rate (leveringstarief)
- One-time connection fee (eenmalig aansluittarief)
- Periodic subscription charge (periodieke aansluitvergoeding)
- Capacity Fee and standing charges (capaciteitstarief en vastrecht)
- Measuring rate (meettarief)

3 TARGET GROUP

To determine which target group is most interesting for Rotterdam, for the citizens and for the building owners themselves, is a difficult question. There will be always a trade off since every stakeholder has its own interests.

For this action plan it's important that the chosen target group gives opportunities to create additional impact to what is already being done in other programs in the city. And that it is compatible with other programs and projects.

Then there is the ownership structure, the mandate of the city and the social situation.

The social aspect is important for Rotterdam, by choosing a target group where a lot of people suffer from energy poverty, the impact works out in two ways: First of all the net amount of energy used by the building is reduced with a large amount after the renovation and second, the future financial perspective of the inhabitants will improve and ultimately a special loan trajectory can be prevented and a negative spiral ending in losing jobs and becoming dependant on financial help from the government. For Rotterdam this is from a human point of view important, but also for the economics of the city, since the financial help is paid by the city.

From a technical point of view it's important to choose a target group which has a quite uniform type of building, so measures can be up scaled to larger numbers to lower the investment costs. Secondly the learning curve on which measures work best for this type of building is much faster.

The already mentioned most important programme in Rotterdam for building renovation of houses and community buildings to lower the energy consumption, is Acceleration010 (Versnelling010). This action plan is fully compatible with that programme and close communication has been going on. Acceleration010 has an overall goal to have renovated 10.000 houses in 2018, and 30.000 by 2025.

The target group for this action plan will be the same as for Acceleration010 the home-owner-associations HOA's. This can be mixed ownerships with housing associations.

It can be distinguished between 4 different groups of HOA's:

- Small HOA's (1-9 units)
- Medium HOA's (10-25 units)
- Large HOA's with more than 25 units
- Mixed ownership: home-owners and housing associations

Our special focus is on medium size HOA's, category 5 from chapter 2.

We choose this focus because this target group:

- social: is hard to reach, but have now special focus via Acceleration010
- social: has often financial problems and/ or suffer from energy poverty

- social: the area with this kind of buildings and inhabitants are often in need of revitalising the whole area. So an integral approach can be done with building and public space renovation
- energy impact: has an energetic problem often and a bad energy label, especially the medium sized associated owner buildings
- impact: there are a lot of this type of buildings and associated owner groups
- technical: the buildings are technically quite good comparable, so measures can be scaled up
- health: since most of the buildings are built between 1950-1970, the indoor air quality is poor due to a bad ventilation

4 OBJECTIVES

The overall objective is as stated in the Rotterdam programme Acceleration 010: goal is to renovate and lower the energy consumption for 10.000 houses in 2018. We adopt this objective for this action plan. But special focus is on the more difficult target group: the medium sized associated owner buildings, sometimes mixed with property from social housing companies.

Important is that we look at buildings which are in need of renovation from a technical point of view, so a critical part of the installations and building structure/materials is at the end of its lifetime. The energy part of the renovation can then be done much more efficient and will make a reasonable share of the total investment.

In the renewed Sustainability Programme 2015-2018 (Programma Duurzaam), not only objectives are formulated for energy reduction, but also for sustainable energy production. A part of this can be generated on the buildings that are renovated. Overall goal is to produce more sustainable energy in 2030 than the city consumes against lower costs.

Next to lowering the energy demand and generate sustainable energy, Rotterdam also promotes the use of waste heat. The objective is to have 150.000 houses connected in 2035 to the city heating network.

The objectives for this action plan in more detail:

- 10.000 houses have to be made sustainable with a lower energy consumption, of which:
 - 7.000 social housing
 - 3.000 private home owners, of which:
 - 1.500 associated owners

Rotterdam has more than 12,000 Home-Owners Associations HOA's. 80% of these VvE's consists of less than 12 units. More than two-thirds of the HOA's has no long-term maintenance planning (MJOP). Especially in the old city neighborhoods HOA's are not active. Because of the growing number of new apartments and sale of flats by housing corporations and institutional investors, grows the number of homeowners associations in the Netherlands and in Rotterdam. The ambition of Acceleration 010 is to preserve 3,000 private homes, half of which is focused on properties in HOA's. The aim of the approach is to have at least 1500 homes, which are part of an HOA, more sustainable with the desired result to achieve quality improvement, ensuring affordability, and obtaining a green energy label (energy label A, B or C).

Focussing on the associated owner buildings: the objectives are:

- minimum energy improvement of 3 energy label steps
- improve the associated owner information point
- lower the energy bill by 5 percent
- financial offer including a loan with 0% interest
- follow up by good energy monitoring, using smart metering and remote access in one database/energy management system

- follow up by questionnaires, each year after 1 year after renovation for checking the social and financial and health aspects
- measure the CO₂ concentrations, humidity and temperature in 5% of the renovated buildings, to learn if the measures are working well and situation is improved
- make a tailored way to communicate to this target group, trying to stimulate bottom up initiative
- Use LCC financial calculations with a scope of 30 years to calculate the profitability
- Play as a local government an active role (to facilitate, to take initiatives when needed, to define the frame of work), not only in the communication as a neutral party, but also by providing a platform for sharing experiences, like a market place, including reviews of market parties. Give second opinions on advice of market parties or help set up functional specifications for tenders, and play a role as sparring partner for the municipality management board.
- Help assessing and planning an integral approach. The city of Rotterdam has knowledge on the city infrastructure, so using this, preferably in a GIS based system, can make an integral approach possible. Combining the end of life moment of (energy) infrastructure with investing in sustainable energy solutions which save on infrastructural costs makes then a more feasible business case.

5 STRATEGY

For Rotterdam it's important to connect all relevant stakeholders in the process. In this way it is more likely that solutions are generated that are realistic. Acceleration010 is the collaboration programme with the stakeholders in the city.

The time schedule is an important issue when it comes to carry out the implementation plans. The municipality board has officially started in 2014 and is due to end in 2018. The current strategy is mainly meant for current municipality board period. The longer term strategy should be addressed but in a different manner, since from a city point of view the budget cannot be reserved for the next board period. Evidently there is a long term scope in the Sustainability programme (Programma Duurzaam) and in Acceleration010 (Versnelling010).

Guidance on a national level

The approach does not stand alone, but is a common part of the programme Private Housing (Particuliere Woningvoorraad) in cooperation with the assistance counter for HOA's VVE-010. Experiences of ongoing projects are used to set the strategy for HOA's up.

Outside Rotterdam is connection sought with the HOA programmes of other municipalities, particularly the Hague. Tuning with the (former) Stagsregio takes place on a coordinated approach. For that, resources are set in by the association of Dutch municipalities VNG.

At a national level, VNG provides municipalities with guidance to reach out the homeowners. Consultancy company NEWNRG is commissioned by VNG to provide guidance to municipalities. The approach of the target group HOA's is a tailor made method. Before implementing, there needs to be done a more precise study on what the different inhabitants really want and what they are willing to invest.

The three factors have to be tackled in a way that fits best for the inhabitant (NEWNRG):

1. **Basic:** the message reaches its goal best when coming from a relative or trustworthy party and has to fulfil a need that's there. It has to be clear that more inhabitants are involved and do the same. Rotterdam can help with this as an independent party. The common practice that energy companies sell energy reducing measures does not work well in Rotterdam
2. **Emotion:** The WOW factor: it should be looking nice or give status and it should have an urgency to participate (e.g. lower price temporarily). To help with this it's good to have best practices in the area where local inhabitants can come and visit.
3. **Logic:** the product has a good return on investment or is a good investment. For this a special loan or third party that invests should be sought.

There can be made four different groups with different incomes and different living conditions (NEWNRG):

1. **High income**, mostly older people where the kids have left the house, these people like to have status, do good for the world and want to have profits from their money;
2. **Families with high income**, with kids and busy. They look also for status and want to prevent losing money;

3. **Mid income:** these people need the money to live and want to prevent losing money. They want to do things in a group;
4. **Small income:** these are often also the more energy losing houses. The inhabitants want enough money to be able to eat.

The focus target group will mainly be with people in the third and fourth category. So there is not much money they can spend on measures.

When it's clear how a certain target group should be motivated to take action, the approach should be to make a document with the effort that has to be reached.

To activate and to motivate home-owners on a regional and city level

For activating and motivating home owners a dedicated assistance counter is created at a regional level the WWW (Woon Wijzer Winkel) www.woonwijzerwinkel.nl financially supported by the VNG.

On the website of city of Rotterdam www.rotterdam.nl/energiebesparing, there is also information given to HOA's among others. This site is linked to the WWW, see Figure 2.

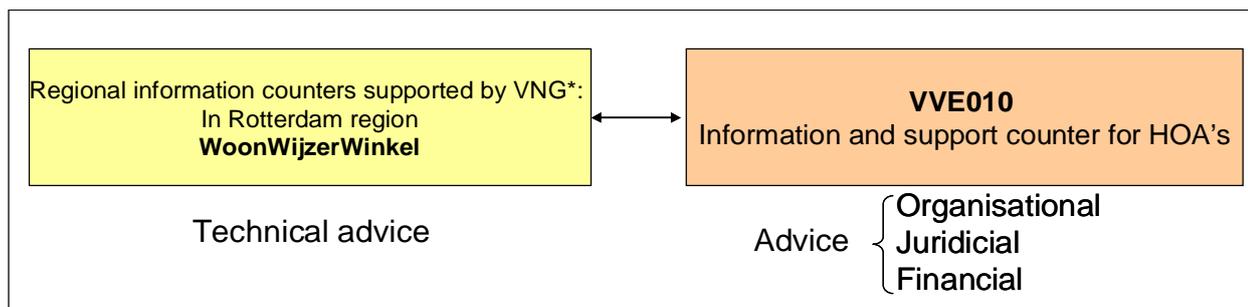


Figure 2. Assistance counters VVE010 en WWW

At a city level, the counter VVE010 is available specifically dedicated to provide assistance to HOA's. Originally, it was dedicated to small HOA's located at the southern river bank but its coverage area is in 2016 extended to the whole city and its task is not only limited to small but to all HOA's.

Because of their complementary specialities and tasks, a close collaboration between VVE010 and WWW takes place. WWW providing technical assistance whereas VVE010 can support HOA's with organisational, juridical and/or financial advices. VVE010 can help HOA's setting up a long-term maintenance planning including sustainable or green (upgrading) measures green MJOP, see Figure 3.

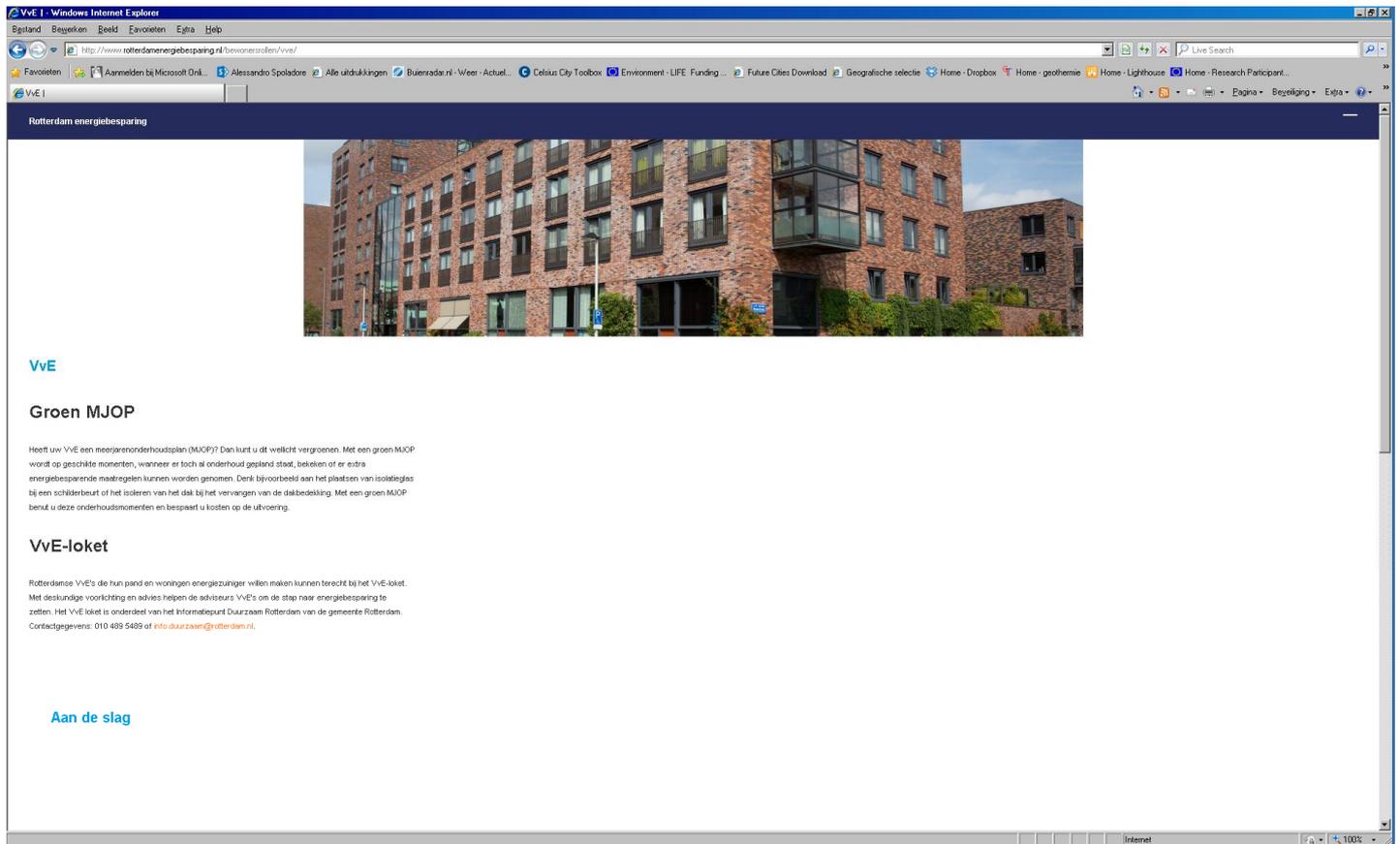


Figure 3. Website of City of Rotterdam web-portal dedicated to Home-Owners Associations

In practice, needs for assistance occur mainly in 2 kinds of situations:

1. In case of a small HOA, VVE010 proposes to take care of the management of the green MJOP.
2. In case of a medium HOA, VVE010 proposes to leave the management of the green MJOP to professional maintenance managers. Professional maintenance managers are usually not sensitive to sustainability. To prevent this shortcoming, training courses are provided by VVE's.

Large HOA's and mixed ownership buildings because of the involvement of social housing associations are generally well-structured and - managed. Generally they do have already a MJOP. Assistance of VVE010 is needed in bringing sustainability in the measures of the MJOP.

Measures and actions

a. Behaviour: activation of HOA's

- To tempt, to activate, to organise

The temptation strategy is in line with that of a (regular) resident. When it comes to addressing HOA's, the group process in which the HOA has to face is an additional key aspect. For this approach, we examine each type of HOA what instruments and combinations of instruments by which party in the phases described can best be deployed to support decision making in the HOA to achieve energy savings.

- To transfer information, knowledge and know-how
The functioning of an HOA depends on the capabilities of the members of the HOA to organize. This requires skills such as addressing each other owner to develop joint initiatives for maintenance and investment in the building. Especially for small HOA's, it is not financially possible to hire professional management to assist in this challenging group process. The municipality wishes to facilitate HOA's here, in close cooperation with parties such as VVE010, social housing associations, NGO's like Blijstroom, VVE met energie.

b. Technics: sustainable quality improvement of homes

- Sustainable maintenance should be self-evident and contribute to a sustainable use of the homes. For HOA's, it means that green/sustainable long-term maintenance plans should be set up and executed.
- Neighbourhood – oriented approach
 - Pilot Molièrebuurt. In Molièrebuurt, the deployment of the improvement coach has started in cooperation with a consortium of parties of Acceleration 010 (Versnelling010) and in guidance of Relocal. Some complexes of HOA's (150 dwellings) will be facilitated with sustainable housing improvements.
 - Pilot Old Mathenesse. In the district Old Mathenesse Woonbron among others executes a total package with different entry options for HOA's. In addition to residents' meetings, informative means are set in oriented on activation by temptation. The focusses here are: the procurement, communications and finance.
 - Focus-area: Prins-Alexander (plans under construction)
- Approach target mixed HOA's

In many mixed owners association's is sustainability a challenge for both the residents and the housing association. Focus herein is the dual decision-making (for tenants at the corporation and owners through the HOA). The assumption in this approach is that the presence of the corporation might help bring management structure, which can facilitate the transition to sustainability. This includes management, maintenance plan, saving and administration. There is at present little experience in housing associations in Rotterdam with this target group. It is therefore difficult to think of the right instruments that can facilitate this target group at this stage. Currently, the housing association Woonbron together with the municipality is working out on plans for 3 HOA's. A major sticking point are loan opportunities according to the housing associations. HOA's loans are not interesting for mixed HOA's. The housing association prefers to fund with low-interest its own rental housing, but is not allowed to fund the home-owners housing. In short, this requires a tailor-made approach from the banks (individual loans, higher risks).

c. Finance: Financing the quality improvement of homes

Rabobank Rotterdam develops for Acceleration 010 (Versnelling010) a loan for HOA's. This business loan is designed for large HOA's (> 25 units) and homeowners associations in mixed management. In 2015-2016, the loan will be further tested in a number of HOA's. Rabobank has developed this loan facility i.a. on the basis of the experience of Amersfoort with the province of Utrecht.

Next to the special low interest loan from the Rabobank, Rotterdam can promote other ways of investing in sustainable measures, e.g. lease construction of solar panels.

Rotterdam should furthermore take action in facilitating and participating in innovative initiatives started by inhabitants and companies, e.g. Blijstroom, Blaakende Zon and Concept House Village. Goal is to raise the amount of innovative products and measures so that replication can be done faster and with more impact.

Last but not least, special effort should be put into lobbying for subsidies from the national Dutch government.

Communication campaigns

One of the strategies to activate and motivate the HOA's is to carry out communication campaigns inside the neighbourhoods. This is also part of a large communication campaign of the municipality to raise awareness on energy efficiency in general. The aim is to bring information, know-how and advice on sustainability and energy efficiency closer to the inhabitants. The various elements of the communication campaign are presented in Figure 4.

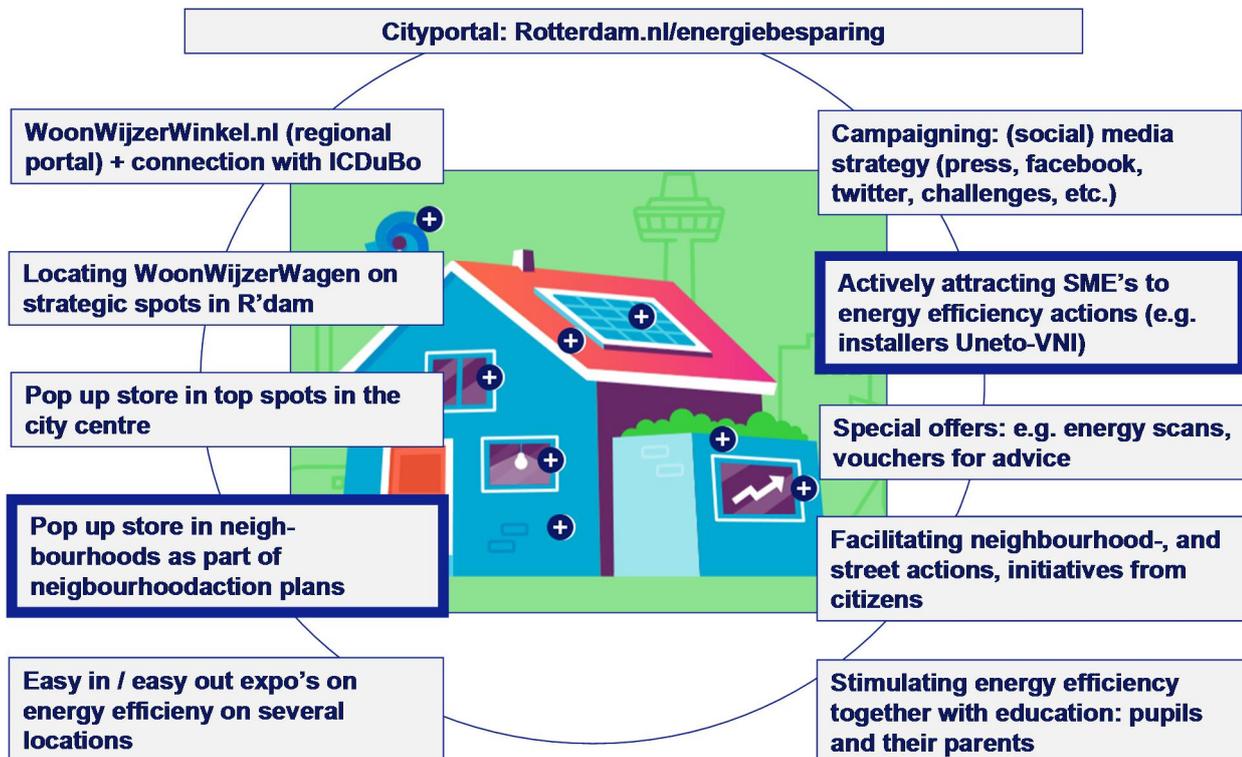


Figure 4. Communication campaign scheme

Roadmap for Action Plan in Rotterdam

Target: Achieve renovation and retrofitting of 10000 existing buildings among them 1500 owned by owners association with at least an improvement of 2 energy label degrees reaching an ene						
Startpoint: 2016-05-01		Final point: 2021-12-31				
Timeschedule	2014	2015	2016	2017	2018	
Stakeholders						
National agreement on energy (SER)*	Started in september 2013					
Municipality management board	Vision based on political programme of new management board					
City of Rotterdam/ Urban development dept.	Programme Sustainability Rotterdam has been revised according to the vision of the new board					
Cooperation Acceleration 010:		Analyses situation	Implementation plan in collaboration	Aim at the end of 2016: 300 homes improved		
Social housing associations	Plan renovation/retrofitting using regular maintenance as a window of opportunity					
Home-owners associations HOA's		Organise courses for HOA's	Open popup stores			
Construction companies, contractors		Open IcDuBo/ WWW to connect supply and demand chain-partnership	Work out projects in focus area: Prins Alexander			
Consultants						
Suppliers						
Diverse organisations (academia, environmental organisations, branch organisations...)		Collaboration with branch organisations				
Banks			Develop loans facility			
VVE-010 and IcDuBo (WWW)		Close collaboration				
City of Rotterdam / Sustainability programme/ Acceleration 010		Start communication campaigns: 'closer to the Rotterdammers' Opening	Open www.rotterdam.nl/energiebesparing VVE010			

(*): More than forty organizations joined in September 2013 the Energy Agreement for sustainable growth. Together, they go for the sustainability of the Dutch society and economy. The signatories are committed for the coming years: - savings in energy consumption by an average of 1.5 percent per year; - an increase in the share of renewable energy to 14 percent in 2020 and 16 percent in 2023; - at least 15,000 additional full-time jobs.

