



Compass,
Energy conscious
in today's society -
both in the home
and at work

Energy Performance Advice For existing housing

EXISTING HOUSING



The Dutch policy on CO₂ reduction in the existing building stock is implemented using the EPA method. This enables approved consultancy firms to assess the energy performance of existing buildings and issue energy saving advice. A subsidy scheme connected with the EPA method encourages the implementation of energy saving measures.

The Netherlands is using this approach to anticipate the "EU directive on energy performance of buildings", which will require energy certification of buildings in each of the Member States by January 2006.



DUTCH POLICY

Housing stock

In 2010 the Dutch government aims to reduce CO₂ emissions in the residential building stock by 10% compared to the year 1995.

The energy-saving potential for the existing housing stock is much larger than that related to the stricter energy requirements for new homes. The Building Code already provides a high energy-performance standard for new buildings. The energy-saving potential in the existing housing stock can be seen from the penetration ratio of energy-saving measures. Between 35% and 70% of the building envelope elements are insulated, while only around 40% of the space heating systems can be described as 'high efficiency'.

moving to another home or planning renovation or maintenance work. These are moments when energy saving can easily be combined with the planned tasks. Improving thermal comfort can also be an important issue relating to energy-saving measures, making the application of energy-saving measures a much more favourable and cost-effective procedure.

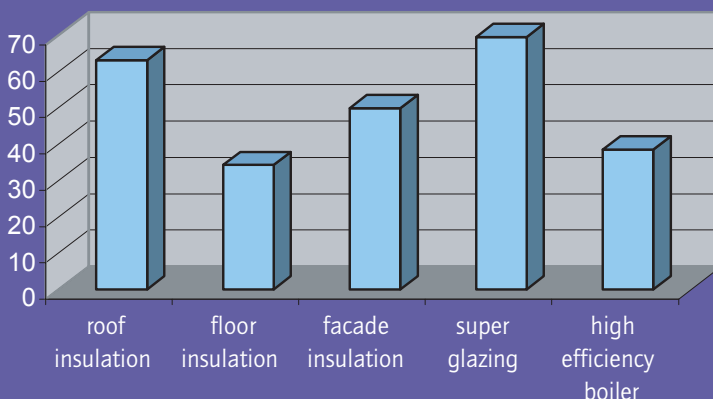
Instruments

(uniform, accurate and easy to use)

Implementing the CO₂ reduction policy effectively has required a set of policy instruments to be developed consisting of four elements:

- **EPA method** (Energy Performance Advice) on a voluntary basis;
- **Formal quality control** approach via certification;

Penetration rate of energy-saving measures [%]



A voluntary approach combined with subsidies

The government's energy-saving policy for existing housing stock aims to encourage target groups, on a voluntary basis, via subsidies and an extensive publicity campaign. This addresses individual homeowners, housing corporations and property developers, together with other market partners such as contractors and local authorities, who are thus encouraged to undertake substantial energy-saving measures in the existing housing stock.

An important strategy in the Dutch policy is to encourage energy-saving measures to be taken at a 'natural moment', e.g.

- **Subsidies scheme** providing financial support for the total investment cost;
- **Monitoring** activities, on a national level, to register and evaluate the effectiveness of the scheme.

This is expected to substantially increase the penetration level of energy-saving measures in existing homes. It is crucial that the **EPA method** can be easily applied to a specific home and put into practice directly. Since the aforementioned instruments will have to be used on an enormous number of existing homes and residential buildings, it is imperative that they be accurate and easy to use.

THE EPA METHOD

PR activities and support

EPA is accompanied by a vast package of PR activities, such as brochures, nationwide TV commercials, a website, helpdesk, workshops and newsletters. Individual PR activities focus on specific target groups.

The aforementioned considerations imply that **quality control** should play an important role.

This has been achieved within the EPA scheme by certifying the EPA software and the consultancy process: all EPA consultants should perform an EPA according to an identical, specific procedure. The certification procedure has been formally established.

Subsidies are available for a range of energy-saving measures in existing homes. However, an extra bonus of 10% on top of these subsidies is available if measures are taken based upon EPA advice. The EPA advice itself is fully subsidised, which makes performing an EPA an attractive proposition.

Apart from this, applying large-scale EPA advice to homes owned by housing corporations can contribute substantially to these corporations' insight into the quality of their housing stock. Integrating energy issues into the management decisions of housing corporations is also encouraged.

The boiler breaks down in a privately owned home...

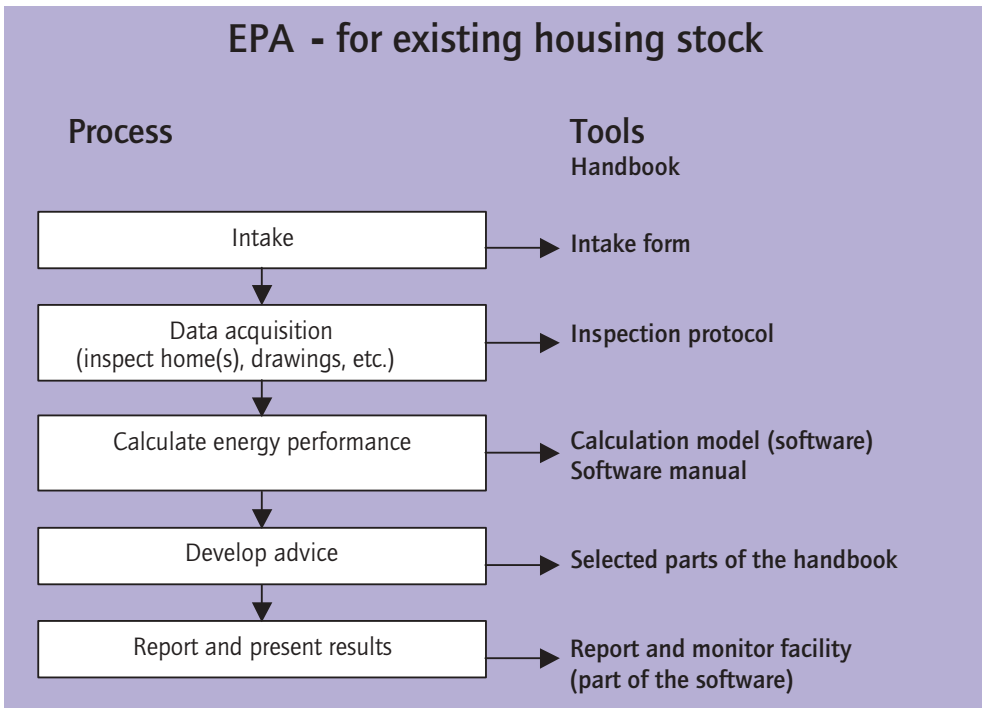
The boiler needs to be replaced so the installer recommends that the homeowner have an EPA carried out, as the advice is free and this is a good moment to see if other measures might also be advantageous. On the EPA website (www.epadesk.nl) the homeowner finds an approved EPA consultant nearby and invites him/her along. The EPA consultant inspects the entire house and asks if there are any problems (e.g. mould problems) or whether the owner wishes to improve the indoor comfort of the home. Based upon this information the consultant calculates the current energy consumption and discusses potential energy improvements and their cost-effectiveness. The consultant notices that the house is not insulated and that the owner would like to have a larger supply of domestic hot water. The EPA software shows that wall and roof insulation has an attractive payback period and, since the boiler has to be replaced anyway, the consultant advises installing a combined boiler, to supply both space heating and domestic hot water. The homeowner does not have to apply all measures at once – priorities can be set and any future measure included in the EPA advice may still receive the bonus subsidy. The consultant drafts the EPA report, which the homeowner then uses to apply for the bonus subsidy and requests the contractor to implement the measures.

Housing corporation integrates energy performance into their strategic approach

the housing corporation wishes to include energy performance in their stock management policy. They start with a large-scale EPA for all their residential buildings to determine the present status of the energy performance. The energy performance goals of the housing stock is then assessed and a plan made showing how to achieve this, including a time frame and budget



EPA is an energy advice method for the existing housing stock, and is in fact a certified consultancy process together with a set of tools.



The EPA method

This is a complete consultancy process that has been modified to make it suitable for issuing energy advice for existing housing. The method is described in a handbook and the tools available enable the consultants to assess a building in a uniform way. The intended impact of the advice is that homeowners are expected to take extra measures, such as fitting insulation, high-efficiency boilers, active solar systems etc., encouraged by the advice and the accompanying subsidy system. The EPA calculation model sits at

the centre of the set of EPA tools, and is also incorporated in a software tool that calculates the energy consumption of an existing home or residential building and identifies potential energy-saving measures (based on cost-effectiveness) related to the building. After selecting ‘energy-saving measures’ the software calculates the new energy consumption based on the actual energy consumption of the inhabitants, including the investments, savings, CO₂ emission reduction and annual savings on energy costs.



The calculation method determines space heating, domestic hot water and electricity for fans and pumps. Renewable energy sources are also taken into account, such as passive solar energy, solar collectors, photovoltaic panels, heat recovery, and heat pumps. Based on the primary energy consumption under standard indoor and outdoor conditions, an energy performance score is then calculated, known as the Energy Index (EI).

The input data from intake and inspection:

- project identification (name, address, location, etc.)
- building and construction characteristics (surface areas, U-values)
- type of installations
- occupants (number of persons, actual energy consumption)

An extensive construction library is available to help define U-values. Key values are used for the various types of installations.




The report presents:

- description of the existing situation and a set of recommended energy-saving measures
- energy consumption (space heating, heating domestic hot water, electricity for fans and pumps), CO₂ emission, EI; both for the existing and the new situation
- energy savings, investments, subsidies and annual energy costs after applying the recommended energy-saving measures

The Energy Index (EI): energy performance as a single number

The EI is one of the outputs from the EPA calculation. This is a single figure that represents a home's energy performance. The lower the figure, the better the energy performance (value between 0 and 2). The EI is defined in such a way that it is independent of the housing geometry. This means that the EI is only determined by the energy quality of the building. A large villa

can therefore have the same EI as a small apartment, as long as their energy quality is the same (same level of insulation, same installations etc.).

Housing type			
			
Energy demand (m ³ gas)	8000	1600	1000
Energy Index (EI)	1.8	1.8	1.8

The EI can therefore serve as a basis for energy labelling, and can be used to further refine the EPA policies (e.g. subsidies may be given for homes reaching a certain level of EI).

Applying EPA on different levels

EPA opens up a wide range of application levels:

- **An individual house:** a homeowner can have an EPA consultant perform an EPA for his/her own home and, based on this advice, then decide which energy-saving measures to implement and receive a bonus subsidy.
- **A residential building or block of homes:** the building owner (usually a housing corporation or a commercial housing operator) can have EPAs performed in order to fit these recommendations into the maintenance plan of the building. This is an approach that can be fairly cost effective, as maintenance and energy saving are combined (comfort is often also improved).
- **Housing stock:** a housing corporation or commercial housing operator needs a good overview of their housing stock and its condition, with regard to technical condition, comfort, annual cost and energy performance. EPA can help to map out the energy quality of the building stock and assist in defining measures to raise the condition to a higher level.

Commercial housing operator decides to make energy performance part of the maintenance approach. The operator is well aware that it is more cost effective to consider energy performance as part of maintenance and renovation strategies, rather than regarding them separately. The organisation therefore decides to train its staff as EPA consultants, so that energy becomes an integral part of the maintenance and renovation plans for their building stock through in-house knowledge and EPA advice.

FUTURE DEVELOPMENTS

The EPA approach is subject to further development since it is the Dutch government's key instrument in achieving its CO₂ reduction goals for existing building stock.

Developing EPA for non-residential buildings

EPA for homes and residential buildings has been in operation for approximately two years now and the optimisation process is ongoing. The experience gained is currently being incorporated effectively into developing an EPA for non-residential buildings, such as offices, schools, health-care buildings, shops, etc. The non-residential EPA will probably vary more in appearance and function, due to the diversity between the different sectors of the non-residential building stock, but this EPA should be available by 2004, together with a quality control system similar to the one used for the residential sector. A handbook and a training course are being developed for EPA consultants.

Further development of EPA for existing housing

The EI expresses the energy performance in a single figure, but it can also serve as an energy label similar to that used for household appliances. Several studies are currently being performed in order to establish an accurate and appealing labelling approach. This type of label would actively promote EPA in the marketplace and could act as an important key acceptance parameter.

An interactive version of EPA is currently being developed (i-EPA) that will be

accessible through the Internet. EPA consultants will have access to a central server where personal space is reserved for their individual EPA projects and where they can perform energy calculations using the central EPA software. Monitoring and updating software will become far easier.

A Pre-EPA scan is under construction in order to help individual homeowners find out whether an EPA could be useful. This is a simplified method, available through the Internet and using simple input data.

Anticipating the EU directive

Apart from national energy-saving goals, the Netherlands will also implement the 'EU Directive on the energy performance of buildings'. Dutch energy saving policies, including EPA, already addresses the EU directive to a large extent, so the forthcoming changes will be relatively minor.

The Netherlands Agency for Energy and the Environment (Novem)

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