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Explanatory notes on the summary of 'Zonneklaar', the advisory document produced by RMNO on Solar Energy

Dear Sir/Madam,

We are pleased to present to you the summary of the RMNO publication on solar energy, entitled 'Zonneklaar'. This advisory document was produced in response to the question of whether or not the use of solar energy should be stimulated, and, if so, how this can best be done. The document contains a decision-making model which gives insight into relevant policy options, the corresponding policy instruments and possibilities for optimising these instruments.

The information contained in the advisory document has been based on extensive research, including a quantitative analysis. The cost and benefit analysis has led to a number of propositions being formulated, and estimates made, which, given the static analytical framework applied, should be regarded as provisional. It is the intention that the present analysis should be supplemented with a further analysis based on a dynamic model. Any potential differences in these models in no way affect the substance of the final conclusions of the report.

At the end of 2004, Mr. Pieter van Geel, Secretary of State for the Ministry of Housing, Spatial Planning and the Environment, commissioned RMNO to undertake an analysis of the issues relating to solar energy. This advisory document 'Zonneklaar' is the result of our analyses, and the decision-making model we have devised will be used by his department in their task of formulating a more coherent policy on solar energy. Read for yourself why it is better to have no policy than to have inconsistent policy, and discover that solar energy is a form of sustainable energy which promotes environmentally aware behaviour, and which, in addition, may well have a beneficial effect on the security of energy supplies, innovation and employment.

We will be publishing both the text of the Dutch brochure and the English summary on our website. Further copies of the advisory document 'Zonneklaar' are available from our Secretariat: +31 70 31 55210 or bureau@rmno.nl .

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GREEN LIGHT FOR SOLAR ENERGY

Summary, conclusions and recommendations

BONE OF CONTENTION

Energy policy is regularly a bone of contention in Dutch politics. Nuclear energy used to be, and may in future again become, the main cause of conflict, but current discussions centre around the promotion of sustainable energy, such as solar and wind energy.

The Dutch government operates within an extensive network of connections in global and European markets. It no longer enjoys the sovereign right to determine the country's energy policy. On a large number of issues, supra-national schemes take priority. This does not mean that all room for manoeuvre has been lost. In Germany, solar energy is stimulated via a system of rebates to those who return solar energy to the network. All countries which are members of the Organization for Economic Cooperation and Development (OESO) provide financial support to scientific research into solar energy.

The Netherlands, too, has applied and continues to apply a number of instruments to stimulate the use of solar energy. From 2001 – 2003, an energy premium mechanism was in place which subsidised the purchase of equipment such as solar panels. Wide use was made of this scheme. All estimates were exceeded and in the second half of 2003 the scheme was cancelled. The way in which this was announced provoked a further torrent of purchases.

The Dutch government currently applies an energy performance standard for new buildings, gives subsidies, has a number of taxation schemes relating to energy saving and sustainable energy, and even offers a moderate compensation payment of 9.7 percent per KWh for the return of residual energy. 'Prizes' and 'labels' form part of the policy instruments.

Application for advice

In the light of recent history, it is understandable that Secretary of State Van Geel in December 2004 asked RMNO to investigate whether stimulating the use of solar energy should be encouraged with measures pertaining to consumer goods.

The request for advice consisted of 4 concrete questions:

1. Is it possible, using a cost-benefit analysis (CBA) focused on a case of solar panels and boilers, to clearly demonstrate whether a subsidy

instrument is an effective and efficient means of extending the market for sustainable consumer goods such as solar panels?

2. It is possible to analyse how a subsidy instrument such as the solar energy subsidy fits into the whole package of available instruments (both financial-economic and regulatory) for technological development and market growth?
3. Can recommendations be given, based on analysis, for optimising a subsidy instrument to encourage the use of consumer goods such as solar cells?
4. Can recommendations be given, based on analysis, for other possible instruments for broadening the market for consumer goods such as, for example, the use of solar energy?

After a bureau study and a workshop with experts from the scientific field, business life and specific interest groups, as well as with Secretary of State of VROM, we have, after discussion with the client, changed the question to the following:

For what objectives, related to sustainable energy, is the use of applications of solar energy effective and with what stimuli is it possible to broaden the market for (applications of) solar energy?

History

RMNO's advisory document does not constitute a unilateral response. With the help of a decision-making model, the advice does offer insight into relevant policy options and relevant instruments.

The Energy Premium System (EPR) was originally a fiscal arrangement. When the Balkenende cabinet came to power, the decision was taken to increase controllability. VROM then became responsible and changed the EPR from a fiscal arrangement to a subsidy. A budget of Euro 54 million was made available. The phenomenal success of the scheme led to the announcement in mid-September 2003 that the arrangement would be discontinued a month later. This announcement caused such a run on solar panels, that the eventual sum expended rose in 2003 to Euro 235 million. There was no repeat of this form of support for solar energy.

Cost-benefit analysis

If we want to form a quantitative image of the benefits and shortcomings of policy, we use a cost-benefit analysis. We carefully examine how the benefits and costs can be brought under one common denominator. To a degree, this is quite feasible: the monetary component of a cost-benefit analysis consists of the advantages of the measure adopted for producers and consumers, as well as the costs and benefits for the government.

The Energy Premium Scheme for solar panels and solar boilers, which was introduced in 2001, was only fully operational during 2002 because in 2003 it was suddenly cancelled. It is for this reason that the cost-benefit analysis only related to the year 2002.

In addition to the monetary element, we use in the analysis a further two components, the environmental aspect and the category 'other'. In the environmental component, we calculate the value of the reduction of carbon dioxide emissions which can be ascribed to the subsidy ruling. In the category 'other', we combine the effects of the ruling which have contributed to the achievement of other policy objectives.
In this case, we add to the analysis a further separate consideration about the quantification of the effects of the sudden ending of the ruling.
The calculations are susceptible to different underlying assumptions. This gives a degree of uncertainty, which is indicated in the analysis in the form of 'margins'.

The costs and benefits which we distinguish are then grouped under three categories: a monetary component, an environmental component and a component 'other'.

The monetary component

Benefits for the private sector consist of the increased producer surplus plus the increased consumer surplus. For photovoltaic systems (PV systems), the benefits from the increased producer surplus are estimated at Euro 5,500,000 with a lower limit of Euro 1,500,000 and an upper limit of Euro 9,400,000. For solar boilers, the benefits are estimated at Euro 4,854,000 with a lower limit of Euro 1,816,000 and an upper limit of Euro 9,100,000.

Benefits for the consumer are represented as an increase in the consumer surplus. For PV systems and solar boilers, the benefits are calculated at Euro 14,400,000 with a lower limit of Euro 6,000,000 and an upper limit of Euro 15,750,000.
Government costs comprise the subsidy expenditure and implementation costs. The subsidy expenditure amounted to Euro 18,000,000, the implementation costs Euro 4,000,000. The extra income from VAT amounted to some Euro 2,260,000. The net monetary costs for the government totalled Euro 19,740,000.

Balance of monetary costs and benefits of the EPR on PV systems and solar boilers

Monetary benefits and costs of EPR on PV systems and solar boilers in 2002

Average benefits		Average costs	
Producer surplus	10,354,000	Subsidy costs	18,000,000
Consumer surplus	14,400,000	Implementation costs	4,000,000
VAT benefits	2,260,000		
Balance	5,014,000		

The environmental component

For this component, the reduction in CO_2 is calculated and multiplied by the estimated price. The reduction amounted to 36,822 tons (PV system) plus 576 tons (solar boilers). This reduction does not apply only to 2002, but to the whole lifetime of the PV systems and solar boilers. The price included in our calculations is Euro 58,30 per ton, a mathematical average based on different sources, including the European emissions trading. The price of an emission certificate is based on the current desired CO_2 reduction. The expectation is that this price will rise in future, which means that the price of CO_2 will have to be adjusted upwards. The benefits of CO_2 reduction are estimated at Euro 2,180,000. If you compare the benefits with the net monetary costs of Euro 19,740,000, the 'benefit' for CO_2 reduction is limited.

The component 'other'

Possible benefits such as extra security of supply at micro-level, increased environmental awareness and a leading position in research and development did not seem to have been valued or were even neglected. We have, therefore, only calculated the benefits from security of supply at macro-level. A possible way of determining the benefits from this element is to estimate the importance which the Dutch government attaches to security of supply. For this, we used the value of holding emergency supplies of oil, which is estimated at Euro 93.27 million. It is estimated that solar energy in 2050 will account for 25% of the electricity production, as compared to 5% in 2002. For this reason, the benefits are estimated at Euro 779,000. Electricity accounts for one-sixth of the total energy production.

Total costs and benefits

The total costs and benefits (excluding the costs incurred in cancelling the subsidy) are indicated in the table below and amount to some Euro 8 million. The $\pm$ before a figure in the table indicates the considerable uncertainty which surrounds the estimated benefits of additional continuity of supply.

THE RESULTS OF THE EPR IN 2002 FOR PV SYSTEMS AND SOLAR BOILERS TAKING INTO ACCOUNT MONETARY, ENVIRONMENTAL AND OTHER COSTS AND BENEFITS

EPR COST AND BENEFIT ANALYSIS FOR PV SYSTEMS AND SOLAR BOILERS IN 2002 (in euro's)

Component	Costs	Benefits
Monetary total		5,014,000
Environmental total		2,180,000
Total other		+779,000
EPR total		$\pm$7,793,000

Costs incurred in abolishing the subsidy

The costs arising from ending the subsidy consisted of costs of destruction of capital, discontinuity of government policy and costs arising from fraud, and for control and maintenance. The fall in the supplementary capital after cancellation of the subsidy shows that investments already made by producers in the high days of the scheme, can no longer be used because their production processes have stagnated. In addition, costs have also been incurred by the discontinuity of government policy. Investors who feel frustrated by inconsistent and discontinuous government policy relating to the promotion of PV systems will subsequently be cautious about making investments. Investments which are delayed or which do not take place because of this, but which would have been made if there had been consistent government policy, are an additional cost element. There are also costs arising from fraud; 18% of the subsidies granted between 16th October 2003 and 15th January 2004 are thought to have been paid out incorrectly as a result of misuse of the interim scheme. Finally, extra costs have been incurred from the checks on the observance the rules which were set at the time for the interim arrangement.

Conclusions of cost-benefit analysis

The first conclusion which can be drawn relating to the CBA is that ending the scheme because it was not effective in terms of CO_2 reduction is justified if the scheme is evaluated solely on the objective of CO_2 reduction. A second conclusion is that the benefits of the subsidy can above all be found if the scheme is evaluated in relation to the producer surplus, the consumer surplus and greater continuity of supply in the future. A third conclusion is that the way in which the scheme was ended destroyed many of the advantages which had up to that point been created. The type of instrument and in particular the design of the procedure relating to cancelling the scheme therefore also warrant attention in considering the policy options relating to incentives instruments.

A decision-making model

Politicians have particular objectives. These are related to ideals or aspirations about society in the future. Objectives lead to policy. This policy often consists of measures which affect one or more aspects of this same society. The policy is directed at specific issues and is implemented through the medium of instruments. In an energy production chain, a possible common issue is the stimulation of research, and subsidy is a possible instrument.

Energy policy is related to optimising measures in the light of the existing objectives. These are complex decisions. There are a range of different methods available to support such decisions.

The first method is one whereby there is one dominant objective, and the other(s) are only considered if two alternatives score equally on the first objective. Although this method seems absurd, it is very similar to what the Dutch government regularly considers. For example, if the only objective of sustainable energy is the reduction of carbon emissions, then biomass is superior to solar energy and solar energy will not be promoted.

It seems more reasonable to classify the various objectives in criteria, to assign a weight to each criterion and to use this to calculate the scores of alternatives measures.

If there are, for example, two criteria under consideration and two alternatives, then it is possible to reach an optimal decision.

For example:

	Criterion 1: Competitive advantage of NL in technology	Criterion 2: Effectiveness (in increasing solar energy)
Alternative 1 O & O subsidy	7	2
Alternative 2 Compensation for return of excess energy	3	8

If a decision-maker gives criterion 1 a score of 2 and criterion 2 a score of 1, then alternative 1 is superior to alternative 2 (2x7+1x2=16) – (2x3+1x8=14) = +2, while a decision-maker who considers criterion 2 to be more important, will give a higher value to alternative 2.

Objectives of sustainable energy

Climate change, high CO_2 emissions, dependence on fossil fuels from abroad and a number of other factors put pressure on energy policy. The Netherlands, therefore, strives for a form of energy production which will in time become sustainable. The use of renewable energy sources such as water, wind, biomass and sun, offers an excellent opportunity to contribute to this sustainability. However, there is currently no optimal production system for generating energy from water, wind, biomass and solar energy. Stimulating innovation and technological development in this field is interesting for the scientific world and offers the opportunity for technological advantage over other countries. There are also opportunities for the solar energy sector within the Netherlands, for example, by improving employment opportunities within the sector. These are advantages which ensue if the Netherlands decides in favour of extra policy incentives for sustainable energy. In this report, six objectives are further

developed, which are relevant if the Netherlands wants to establish a position in the sustainable energy debate.

Objectives which favour the choice for sustainable energy:

- Reducing CO_2 emissions
- Improving continuity of supply nationally
- Using the optimal diversity of energy generating methods
- Strengthening innovation and technological development on a specific scale
- Maintaining and further improving employment opportunities in sectors related to sustainable energy
- Encouraging users to be environmentally aware

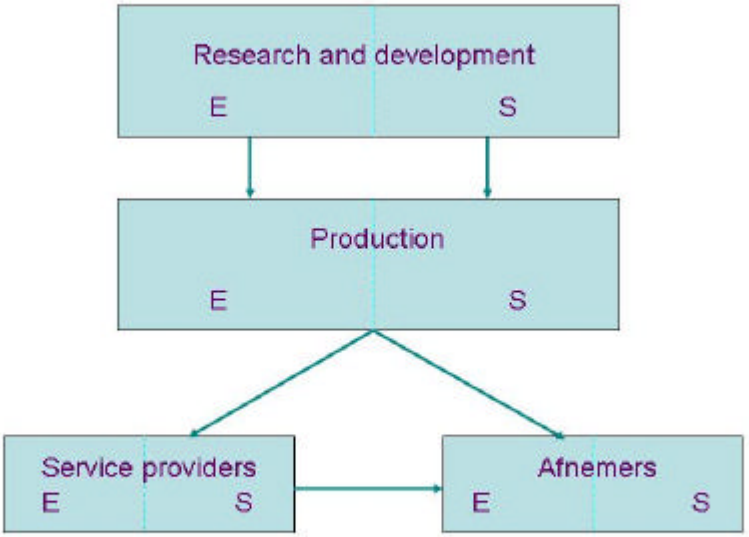
The use of solar energy does not 'score' highly on all objectives.

Both at national and at European level, objectives have been defined to increase the market for solar energy, objectives which will certainly not be achieved. In the Netherlands, a process has been set in motion within the framework of the NMP4, which will shape the transition to sustainable energy. Shortage of government funding has hindered those policies which had ensured a breakthrough in the generation of solar energy. Ending the EPR and, comparable to this, cancelling the subsidy to marine wind farms, has led to a considerable reduction in the opportunities for this form of energy.

Key issues for policy

If the government decides to give a new impetus to the application of solar energy, it is important to determine where and how this impetus can be given. If we look at the 'where', this report talks of points of contact for policy. These points of contact are determined on the basis of the solar energy chain and comprise four links: Research and Development, Production, Service and Consumers.

A further distinction is made between energy production systems (E) on the one hand (solar panels and applications of solar cell technology in the building industry which can return residual electricity to the network) and stand alone applications (s) (in lighthouses, garden lighting, calculators), which are not connected to the network.



A specific issue is the scale on which government policy intervenes. The concept of 'scale' is developed in two dimensions, namely focus on national as opposed to European level and focus on the place in the chain, in front (push) or behind (pull).
The political structure is dynamic, and European policy has increasingly superseded national policy. But, (supplementary) policy can, of course, be developed at national level. Depending on specific insights, a cabinet can, for example, introduce policies to maintain national employment or to strengthen the development of technology nationally. This demands a policy style which is specifically directed at the effect of scale. This means there is a relationship between the physical distance between the manufacture of products and the actual use of these, and the options for policy. It is conceivable that the Netherlands may no longer wish to stimulate pure solar cell technology. This could mean that the competitive position of the Netherlands with regard to the applications of the relevant technology in the construction industry will become an issue. Apart from a loss of employment, important knowledge will also be lost and the building industry will lose contact with the producers. In the end, the application of the technology, in this case, the use of solar energy will stagnate at national level. In the advice, the likely options for solar energy take into account the scale and the effects on the technology. RMNO is in favour of a mixed policy of both push and pull. The focus on push or pull is in part dependent on the

objective for which one is striving. If technological development or employment opportunities are important aims, then the emphasis is on stimulating the start of the chain. If the aim is the reduction of CO_2 or continuity of supply, then the emphasis is on the end of the chain.

Management Instruments

The government can apply a range of instruments to achieve the desired objectives. These instruments vary from taxation to education. The approach is dependent on the objective, the context and the focus group. In this report, three instrument groups are mentioned: legal instruments (injunctions/commands), financial/economic instruments (taxation, subsidies) and communications tools (education, advice, covenants).
Legal instruments applied both in the past and at the present time to stimulate solar energy are the EPBD (European energy performance of buildings directive, in national legislation from 1 January 2006), the EPN (Energy Performance Norm for buildings, tightened from 1 January 2006 to 0.8) and energy certificates (a distinction between types of (environmentally aware) energy production).
Financial instruments applied at present and in the past for stimulating the use of solar energy are Dutch and European research subsidies, project subsidies, fiscal provisions (MIA, EIA, VAMIL), procurement subsidies (EPR) and the residual energy scheme (MEP contribution solar energy).
Communications instruments applied now and in the past for stimulating solar energy are covenants, campaigns, competitions and certificates/stickers. Communications instruments are generally used in parallel to one of the other instruments.
A fourth instrument is the group of supporting measures which the government can apply to discourage undesirable behaviour or to make it completely impossible. These are often measures in the physical sense, such as providing containers for recycling glass, and introducing traffic-free zones.

In the report, an analysis is made per policy issue of the instruments which can be applied by the national government to stimulate the use of solar energy. The outcome is presented in the following matrix in which, for each issue, the possible instruments are given for energy production systems (E) and stand-alone systems (S). The optimum instrument for each issue is marked in bold.

		R & D	Production	Service providers	Consumers	Network
Legislative	E	Make percentage of research obligatory, e.g. via annual theme in the NWO tender system			. Make % of production obligatory for solar energy	
	S	Make percentage of research obligatory, e.g. via annual themes in the NWO tender scheme				
Financial	E	**Funds for R & D**	**Guarantee scheme for sustainable energy**		.Fiscal benefits .**Procurement subsidy** .**Returns compensation** .Raise EB (not solar-specific) .Project subsidy for building and renovation .Government tenders .Guarantee scheme for sustainable energy	
	S				.Raise EB on fossil energy (not solar-specific) .Government tenders	
Communications	E	Award prizes (e.g. Egg of Columbus	Demonstration	.Demonstration projects .Education and training for use of PV techniques	.Communication about government tenders Information provision .Support for advertising .Demonstration projects	
	S	**Award prizes**	**Demonstration**	**Demonstration projects**	.Support for advertising .Demonstration projects **Information provision** .Communication about government tenders	
Services	E	Facilitate applications for (European) funding			.Achieve one-stop shopping for applications for subsidies and purchase and installation of PV systems	**Stimulate expertise units**
	S	Facilitate applications for (European) funding				**Promote expertise units**

Options

The argument in favour of promoting solar energy varies according to the objective of stimulating sustainable energy. For each issue, a set of instruments can be put together on the basis of their effectiveness. This decision-making model indicates how the government can best handle the interrelated aims, the use of instruments and the effects of the measures taken.

It is possible to arrive at a conceptual framework for the different options through a well-reasoned multi-criteria analysis.

Step 1

How much opportunity is there for the solar energy option in the range of aims for sustainable energy? In what mix of objectives is solar energy a candidate for consideration?

Step 2

If you decide in favour of solar energy, how can you best do this and how can each issue be optimised?

Step 3

If you have made the choice between the different instruments, which specifications apply per instrument in terms of effectiveness and efficiency, and what are the general recommendations for the use of a mix of instruments?

Opportunity for solar energy in the range of objectives

The key question here is for what set of objectives is it desirable to opt for solar energy.

Solar energy currently only makes a relatively minor contribution to CO_2 reduction. In terms of this objective, solar energy does not stand a chance. Wind energy and biomass are the preferred options.

Solar energy can potentially make a significant contribution to continuity of supply. This form of energy can play a significant role in promoting continuity of the supply of energy and reducing energy imports.

Given the aim of keeping different forms of energy supply open (diversity of methods of generation), it is desirable to stimulate the use of solar energy.

By cancelling the subsidies for solar energy, the Netherlands is losing its position in the field of innovation and technological development. If the Netherlands wants to continue to apply the existing knowledge and to occupy a top position in the area of technological development, an active incentive policy is warranted for solar energy.

Seen from the viewpoint of employment opportunities, there are two arguments in favour of promoting solar energy. In principle, incentives lead to more employment opportunities, but can also be necessary to counter loss of employment. If foreign contractors build houses in the Netherlands fitted with

solar panels because Dutch development has not kept up to date, the Dutch building industry will lose employment opportunities.

The encouragement of the use of solar energy has a positive effect on the environmental awareness of the consumer. This can be a way of lowering the threshold for many citizens. Citizens themselves also get the feeling that they are contributing to a national cause: sustainable energy is good for the climate and for continuity of supply. Also, a compensation scheme for the return of residual energy gives the consumer the positive feeling of being able to play with the energy meter.

Promoting the use of solar energy makes a positive contribution to five objectives: employment opportunities, innovation and technological development, continuity of supply, diversity of methods of generation and increased awareness on the part of the consumer. Because the instruments which apply to this last aim can also be used for the other four objectives, the aim of increasing awareness of the consumer will not be given separate consideration. For the other four, we have established a responsible set of instruments based on the issues and instruments:

Technology and innovation
A good set of instruments for this goal is:

- Increasing the availability of funds for R & D for energy production systems
- Higher subsidies for the return of residual energy and for procuring energy production systems
- Ambitious standards in the form of lowering the Energy Performance Coefficient (EPC)
- Guarantee scheme for sustainable energy (only for producers)
- Government expenditure relating to energy production systems and stand alone applications in combination with advertising/information provision for both categories, focused on other clients

Diversity of methods of energy production
A good instrument for this objective is to increase the availability of funds for research and development relating to energy production systems

Continuity of supply
An appropriate set of instruments for this objective is:

- Higher subsidies for return of residual energy and for the procurement of energy production systems
- Government tenders for energy production systems and stand alone applications

Employment opportunities
A suitable set of instruments here is:

- To increase the availability of funds for R & D into energy production systems
- Government tenders for energy production systems
- Guarantee scheme for sustainable energy (only for producers)
- Higher subsidies for return of residual energy and for the procurement of energy production systems

General lessons

Once we have run through the three steps of the decision-making model, we arrive at the following general lessons:
First, determine the objective and the term, then the instrument;
Combine pull and push with policies aimed at innovation and technological development;
Apply a consistent policy, without 'open ended' schemes;
Ensure that the incentive policies of the various departments are in line with one another.
Check the legitimacy of the instrument
Optimise the sector chain (agreement with partners in the chain), stimulate the 'one stop shopping' principle.

Specific lessons

Per group in the chain, a number of specific recommendations are indicated below for defining the respective instruments:

Designing the R & D instruments

- Make a clear distinction with funding and subsidies between energy-producing techniques and stand alone systems.
- Evaluate the arrangement at an early stage. Do not continue unnecessarily long with the system.

Design of instruments for producers

- Ensure that there is transparency in the range of schemes available. At the present time, there are many different investment subsidies and fiscal arrangements (VAMIL, EIA).

Design of instruments for service

- Give subsidies for consortia on a project basis to encourage cooperation between contractors, designers and installers.
- Ensure that there is transparency in the range of schemes available. At the moment there are many different investment subsidies and fiscal arrangements (VAMIL, EIA).

Design of instruments for consumers

Purchasing subsidy and return compensation

- Determine in advance in what stage of the innovation cycle the product is currently, and estimate how long it will be before the product will be

in the mainstream. The duration of the scheme can be determined on the basis of this.

- Determine the payback time of the product. This can be used to determine the duration and extent of the subsidy.
- Determine how well the product is known. On this basis, it can be determined whether additional incentives are needed.
- Determine the maintenance sensitivity of the product. On the basis of this, it can be determined whether quality demands, certification, guarantees, etc. are necessary.
- Devise a transparent procedure for cancelling the instruments. This can avoid fraudulent practices and an unexpected 'run' on the product.
- First aim at optimising the chain. A subsidy gives the consumer the final impetus to take action. Before this, ensure that the services of the producers, suppliers, installers, energy and measurement companies are in line. In this way, you can avoid consumers buying a solar panel and not installing or using ot.
- Relate the extent of the compensation for return of residual energy to the costs of using solar energy. If the price falls, the compensation can be adjusted downwards.

Main recommendations

1. It is better to have no policy than inconsistent policy. The Dutch government must never again first raise the expectations of the producers and consumers, who stick their necks out, only to be let down later. This has an effect on confidence in the government.
2. The compartmentalisation within the Dutch government seems to be the cause of a situation where one minister applies objective A and another minister applies objective B. The methods proposed in this advice make it possible to determine the relative benefits of policy instruments with the government as a whole. This is the most effective procedure.
3. As such objectives as continuity of supply, diversity of methods of energy generation and technological innovation become more important, the interest in solar energy increases. With innovation, it is not only about pure solar technology, but in the Netherlands an important consideration is the use of this technology in the building industry and in stand-alone applications. As the objective of employment opportunities gains in importance, the promotion of solar technology integrated into the building industry, the installation industry and the contractors will come more into the picture.
4. Determine carefully on what scale the policy can be implemented: the margins for independent Dutch policy are becoming more limited, but other European countries apply powerful national policies relating to solar energy.

5. In the case of a subsidy instrument, ensure that the period of activity is known in advance and that the amount of the subsidy is adapted to the progress of technological developments; if it is a matter of a procurement subsidy or compensation for return of residual energy, then it is important to ensure that the amount of the subsidy reduces as the cost price of the products fall. This relationship is clearly defined in Japanese and German subsidy policies.
6. Successful technological innovation often takes place if incentives relate both to push and pull effects. Research and production subsidies belong to the push and pull. In the case in question, we advocate a combination of push in the form of R & D subsidies and pull, with the aim of making inroads into the arrears which has been run up, in the event that solar energy scores high in the decision-making model.
7. Limit the number of instruments in relation to the current large number of relatively small policy impulses. A small number of stronger impulses is more effective.