

savills

a **bright** future
for investors
and land owners

spotlight



introduction

European Union

In the Paris Agreement it was agreed that nations would work together to keep global temperature increase this century well below 2°C (above pre-industrial levels) and to pursue efforts to even limit the temperature increase to 1.5°C.

This agreement has led to an evolution of the European Union (EU) target to reduce CO2 emissions in the EU by 20% by 2020 to 40% by 2030, compared to the level of emissions in 1990. This includes a requirement for the share of renewable energy to be at least 20% and 27% respectively of all energy generation. Currently there are negotiations taking place to raise this requirement to 30% by 2030.

Several studies show that this reduction in CO2 emissions will not be sufficient to meet the targets set by the Paris Agreement. Large-scale deployment of clean energy sources therefore appear inevitable in order to turn the tide.

Renewable energy in the European Union

Currently, the share of renewable energy as a portion of total energy consumption is approximately 17% across the EU. The most important sources of renewable energy generation are biomass, wind, solar and hydropower. Of course the most abundant source differs by country. Front runner Sweden, for example, has a renewable energy share which is higher than 50% of total energy consumption, almost all generated by hydropower. Countries with a relatively high share of energy generated by wind or solar are Germany, France, Spain, Portugal and the United Kingdom (UK). This is due to the fact that these countries introduced subsidies and financial incentives for stimulating the generation of renewable energy at a relatively early stage.

Because of this, Germany and the UK now have a mature solar energy market. Spain and Italy generate solar energy on a large scale as well, especially due to the many hours of sunshine and the high intensity of light. Grants however are less sufficient and the electricity grid is less advanced but development is continuing nevertheless, and in some cases subsidy free.

The Netherlands

the Netherlands needs to catch-up

The performance of the Netherlands is one of the worst within the EU when it comes to using renewable energy sources; only Luxembourg and Malta have a lower proportion of renewable energy in the mix. For this reason the Netherlands needs to catch-up and a burgeoning investment programme is underway. In the recent government agreement published by the Rutte-III cabinet, it is indicated that the goal of reducing CO2 emissions by 40% will be increased to 49% by 2030. In order to achieve this, the cabinet needs to reduce CO2 emissions by an extra 56 megatons per year by 2030. This is equal to a quarter of the current CO2 emissions in the Netherlands.

One of the ways in which the cabinet aims to achieve this reduction is to use carbon

capture and storage (CCS). Of the 56 megaton CO2 reduction, about 20 megatons has to be achieved through CCS; there is, however, criticism surrounding CCS. Irrespective of safety issues, the technique is relatively expensive and energy-intensive. There are also doubts that projects at scale can actually be realised. According to a report by McKinsey¹, a reduction of 3 megaton through CCS would be a more realistic scenario. Moreover, the technique does not contribute to the transition away from a fossil fuel led economy. Therefore it seems wiser to focus on renewable energy sources.

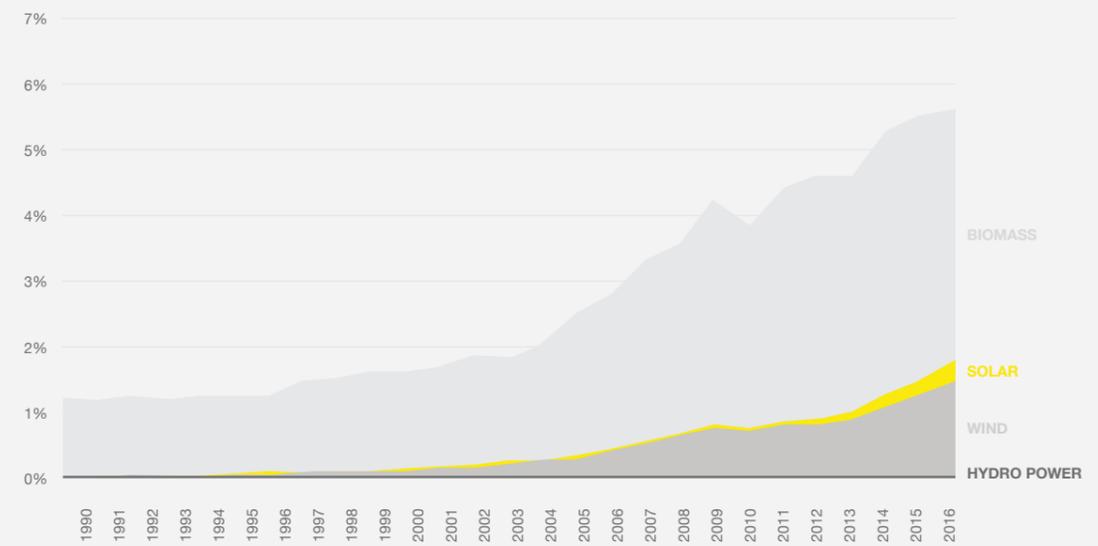
Renewable energy in the Netherlands

The development of these renewable energy sources is actively being stimulated by subsidies. The most important one is the SDE+ grant ('Stimulerend Duurzame Energieproductie', translated: stimulation of sustainable energy production). This grant covers the gap between the costs of generating sustainable energy and the wholesale price per kilowatt hour (kWh)

available on the electricity market. At the moment, renewable energy projects are not (yet) viable without this grant. Partly thanks to these grants, currently more than 5% of the total energy consumption is generated by renewable energy sources. Biomass is by far the largest renewable energy source in the Netherlands at the moment, as can be seen in the graph above. The share of wind and solar however is growing at a faster pace.

Based on the view that wind sources are more intrusive on the living environment* and the fact that the availability of good locations for wind turbines is limited, we are seeing a rapidly growing number of large solar projects. The solar radiation, the advanced electricity grid and the moderate climate which is ideal for the functioning of solar panels make the Netherlands eminently suitable for these kind of solar park developments. This has also come to the attention of investors. Supported by the SDE+ grants it is likely that the Netherlands will be the next mature European solar market.

GRAPH: SHARE OF RENEWABLE ELECTRICITY SOURCES IN GROSS NATIONAL ENERGY CONSUMPTION: (SOURCE: CBS)



* this is also illustrated by a recent survey by Ørsted (former DONG Energy) among 2,000 Dutch respondents, of which 82% indicated that the Netherlands should make more use of solar energy
¹ McKinsey, Energy transition: mission (im)possible for industry? A Dutch example for decarbonization, Oktober 2017



A brief history on solar panels

The history of solar panels goes back to 1839, when Antoine César Becquerel, a French physicist, discovered that metal tags in a conductive fluid create a voltage and electricity when illuminated: the photovoltaic (PV) effect. In 1883 Charles Fritts is the one who creates the first real solar cell, consisting of layers of selenium and a thin layer of gold. In 1939 it was discovered that silicon could be used for

this PV-effect as well. This technique has been improved so much that by 1958 the first solar panel was ready for use. This was done by the NASA, who used the solar panels as energy source for satellites. Ever since it is impossible to think of aerospace without solar panels and due to the tremendous reduction in costs they have been affordable for private use for many years now.



TABLE: TOP 5 LARGEST SOLAR SYSTEMS IN THE NETHERLANDS ²

NO.	NAME	MWp	LOCATION	TYPE	YEAR
1	SUNPORT DELFZIJL	30.8	DELFZIJL	FIELD	2017
2	SOLAR PARK WODLJERSPOOR	16.0	GRONINGEN	FIELD	2017
3	DE GRIENE GREIDE	8.0	GARYP	FIELD	2016
4	SOLAR PARK AMELAND	6.0	BALLUM	FIELD	2016
5	SOLAR CAMPUS PURMEREND	5.6	PURMEREND	FIELD	2016

TABLE: TOP 5 LARGEST SOLAR DEVELOPMENT PROJECTS IN THE NETHERLANDS WITH ENVIRONMENTAL LICENCES AND GRANTS

NO.	NAME	MWp	LOCATION	TYPE	YEAR
1	SOLAR PARK MIDDEN GRONINGEN	103.0	SAPPEMEER	FIELD	2019
2	SOLAR PARK SOLARFIELDS	70.0	BORGER	FIELD	2018
3	SUNVEST	56.0	MUNTENDAM	FIELD	2018
4	SOLAR PARK SCALDIA	55.0	VLISSINGEN	FIELD	2018
5	SOLAR PARK OUDESCHOOT	51.0	OUDESCHOOT	FIELD	2018

The Development of Solar Panels

What makes solar energy increasingly interesting, is that solar panels are becoming more efficient.

Of course output also depends on the location and the Netherlands has a favourable climate, since the moderate climate is ideal for the functioning of solar panels. As well as latitude having an effect on irradiance, areas situated near the coast have a potentially higher energy yield, as the sunlight is reflected by the sea onto the cloud base and back onto the land. This is shown in the figure on the right. Alongside the increasing efficiency of solar panels, the costs of manufacturing have also decreased tremendously. According to Bloomberg, costs have decreased from \$76 per Watt peak (Wp) 40 years ago to currently about \$0.40. Compared to a year ago costs have decreased 26%.

In some countries, like Germany and the USA, solar energy is even rivalling coal when it comes to the levelised cost of energy from new facilities. It is expected that this will be the case for many other markets as well in the years to come, including large markets such as China and India.



REVENUE SOLAR PANELS IN KWH/M² (SOURCE: RVO)



Solar Parks

the generation of solar energy in the Netherlands is growing rapidly

As stated previously, the generation of solar energy in the Netherlands is growing. The total capacity now is about 2 gigawatt (GW). The largest part concerns relatively small projects. So far only five large solar parks (>5MW, or megawatt) have been delivered. The total established capacity of these parks is more than 66 MW, which is similar

to the energy consumption of about 20,000 households. Information about the largest projects is shown in the table above.

It is expected that the number of large solar parks will increase exponentially in the years to come, given the fact that many projects have received environmental licences and grants. This development is also supported by the reduction in costs for solar panels, an increasing awareness of the necessity of renewable energy sources and a positive change in legislation. Next to this, many believe that large projects are more favourable than a fragmented landscape of smaller projects.

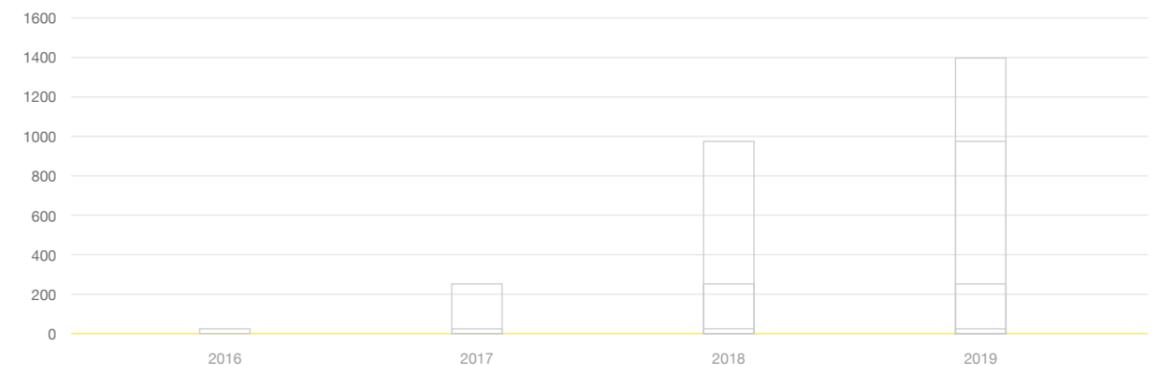
Based on SDE+ provisions it is expected that about 1.3 GW of large solar parks will

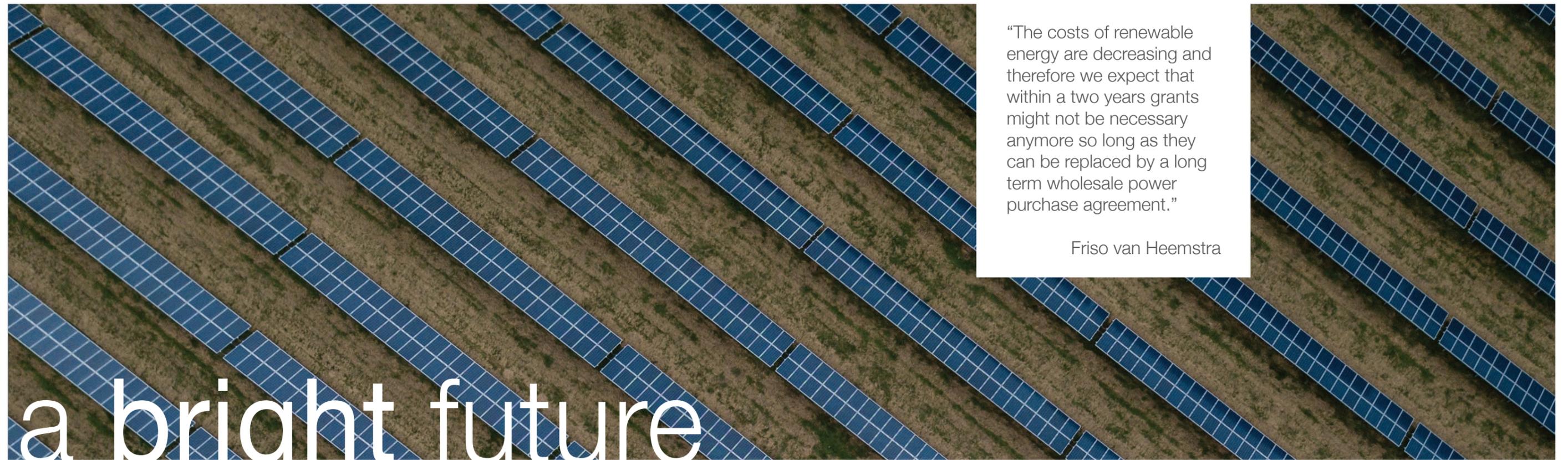
be delivered in the years to come, of which about half in 2018. The largest projects (with environmental licenses and grants) shown in the table above.

Recently the latest round of grants has been closed. While it is not yet known which projects have been assigned a grant precisely, the round was a great success. For about €10 billion of grants was submitted, while budget is only €6 billion.

Solar dominated the applications, both in budget (circa €4 billion) as in in capacity (almost 61%). It also already has been made public that the budget for the next round, in the first half of 2018, will be €6 billion too. It is very likely that the same budget will be available in the round at the end of 2018.

GRAPH: CUMULATIVE CAPACITY DEVELOPMENT OF LARGE SOLAR PARKS (>5MW)





“The costs of renewable energy are decreasing and therefore we expect that within a two years grants might not be necessary anymore so long as they can be replaced by a long term wholesale power purchase agreement.”

Friso van Heemstra

a bright future

Investment Market

In 2016 a total of \$116 billion was invested in solar energy worldwide.³

Therefore one can say it has become an established market. Experienced investors, including multinationals and banks who want to be associated with sustainability, are entering the market.

One such large investor in, and developer of solar parks is UK based Solarcentury. In November they announced their intention to invest €1 billion in association with Capital Stage, a German investment fund, in solar parks with a total capacity of 1.1 gigawatt spread all over Europe, including some projects in the Netherlands. Shell also announced it is going to invest \$1-\$2 billion in renewable energy sources annually.

At present, domestic solar park developers are the most active solar park developers in the Netherlands. However, there are some large projects in the pipeline from international solar park developers who have entered the Dutch market in recent years. Furthermore, some logistics companies are among the largest investors, such as Rhenus, Segro and WDP. WDP had about €8.4 million of revenue from solar panels on the roofs of their distribution centres, which was about 8% of their total revenues. This was even more than the rents received from their biggest client. This again shows that solar panels are an interesting and stable source of income. In October, WDP announced a plan to invest an extra €25 million in 100,000 solar panels on the roofs of their distribution centres.

Developing solar parks in a nutshell

Finding the right location for a solar park is of great importance to ensure a projects success. When considering locations, the provincial and municipal policies, land zoning and the potential to connect to the electricity grid is taken into account.

When a location is chosen, an environmental license (“omgevingsvergunning”) is required. Only when this license is issued one can apply for the necessary grant. This concerns the SDE+ grant, which covers the difference between the costs for generating solar energy and the wholesale price per kWh available on the energy market. Applications for these grants can be submitted twice a year and occur in rounds. In the first round the chance of receiving a grant is the highest, but the grant per kWh is the lowest. In the subsequent rounds the grant received per kWh becomes higher, but the chance of receiving the grant declines as the budget for the scheme is diminished. The SDE+ grant is regulated by the Netherlands

Enterprise Agency (in Dutch: Rijksdienst voor Ondernemend Nederland, or RVO). When a grant has been issued, one is assured of the grant for 15 years. After the grant is assigned, construction and operation of the solar park can begin. This has to happen within 1.5 years. In order to cover the high investments, a solar park is usually amortised over a period of 20-30 years. After this period there is potential for the solar park to continue subject to ongoing capital investment. Whilst the solar modules (panels) will be out of warranty and their performance will have dropped, there are panels in existence which continue to generate for in excess of 30 years.

A growing number of developers are investing in land positions for the development of solar parks. In general developers conclude an option for a deed of superficies and lease agreement over the required area directly with the land owner. Developers are then responsible for all development risks. The land owner on the other hand will receive a long-term and steady flow of income for a 25-30 year period. This method of adding rental income to land ownership is especially interesting in case of succession issues, unprofitable land or land that has poor accessibility.

Savills Expectations

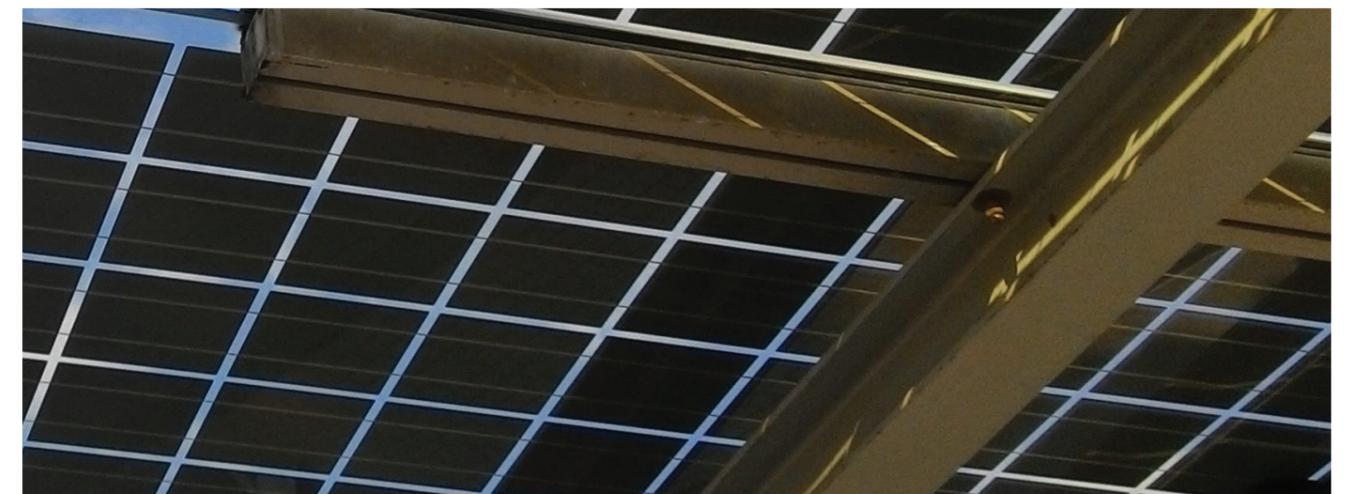
The future of solar energy in Europe, and specifically in the Netherlands, looks bright.

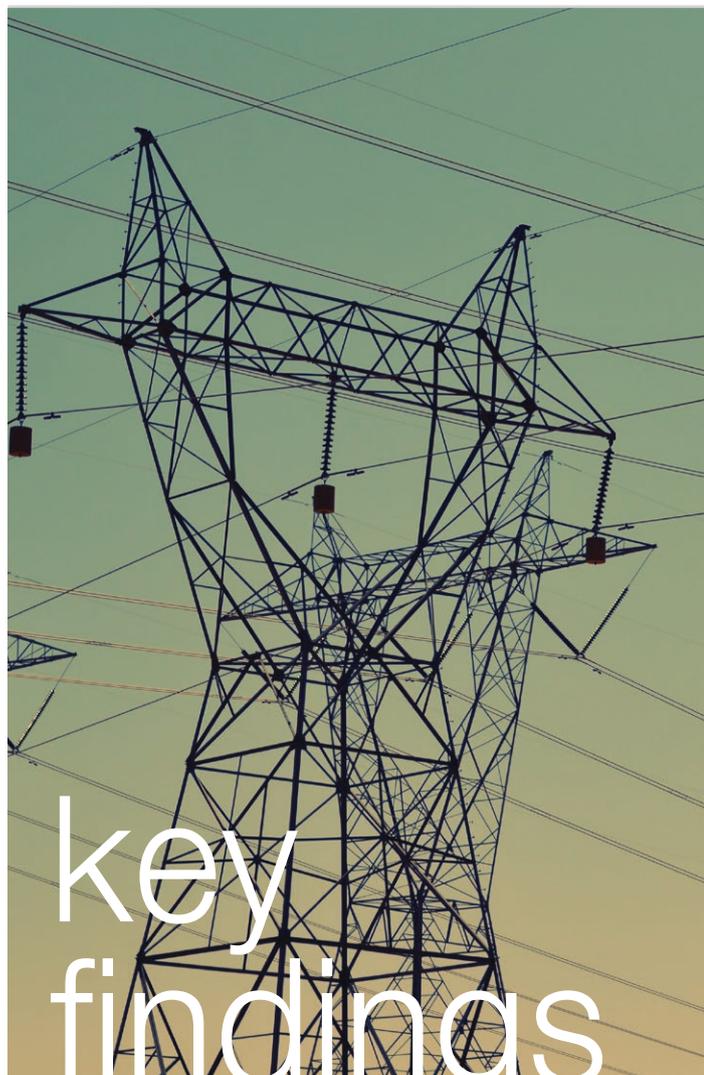
In order to achieve global climate change targets, more renewable energy sources have to be deployed. We therefore expect that not only more, but also larger solar parks will be

developed in the years to come. The most favourable large sites already have been taken, and therefore the greatest portion of the new developments will be projects with a capacity of 30MW to 50MW, which can be accommodated into the landscape without significant harm. We also expect more solar parks alongside wind turbines. This type of hybrid development is interesting to developers and policy makers because sun and wind often alternate and the connection to the grid can be shared, which reduces capital costs. In addition, batteries for energy storage will be placed near renewable energy sources as the cost of manufacturing reduce. This way excess energy production can be stored and utilised when demand for energy

(and the corresponding price) is higher. Grants will be a necessity for a while in order to fill the gap between the costs for generating renewable energy and the costs of conventional energy. This way investors will be guaranteed a relatively stable source of income in order to make projects feasible and reduce the cost of financing.

The costs of renewable energy however are decreasing and therefore we expect that within two years grants might not be necessary anymore so long as they can be replaced by a long term wholesale power purchase agreement. This is already happening in countries with higher irradiance such as Italy and Spain.





Solar Energy

Positive changes in legislation and an increasing awareness of the necessity of renewable energy sources make it increasingly likely that larger solar parks will be developed;

Large-scale deployment of renewable energy is necessary in the Netherlands in order to achieve European and national climate targets;

Solar parks are very suitable for this goal: the Netherlands has a favourable climate, an advanced electricity grid and because of decreasing costs solar energy is becoming more and more competitive compared to conventional energy;

Government Grants

The development of renewable energy sources relies on grants, and therefore the government has a key role;

Win-win

The development of solar parks is interesting for both landowners and investors. Landowners will receive a long-term and steady flow of income, while investors will receive the right to operate a solar park with a to be determined yield;

Alternative Investments

The growing scale of solar parks in the Netherlands and their speed of deployment, makes this sector increasingly interesting for investors who currently invest in other asset classes;

Developments

It is expected that in the near future, more developments of solar parks will be combined with wind turbines and/or commercial scale batteries for energy storage and grid balancing increasing the penetration of intermittent renewables in the energy mix.

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Meet our team at Savills

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