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based photovoltaic solar parks in the  
Netherlands**

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## Samenvatting: Burgerparticipatie en draagvlak bij zonneparken

De aanleg van grondgebonden zonneparken is de laatste jaren in Nederland enorm gegroeid. Tot en met 2018 zijn ongeveer 65 parken gerealiseerd. Bovendien staan er nog eens honderden zonneparken in de planning om de komende jaren ontwikkeld te worden. De ervaring met ruimtelijke (energie)projecten, vooral met windturbines, leert dat omwonenden deze plannen kunnen steunen maar dat er ook weerstand kan ontstaan. Bewoners kunnen bij wijze van spreken een project maken of breken. Het doel van dit onderzoek is om een beter inzicht te krijgen in de perceptie van burgers op grondgebonden zonneparken met een focus op de huidige aandacht voor draagvlak en burgerparticipatie bij zonneparkprojecten op land. Aan de hand van een online inventarisatie van gerealiseerde projecten in Nederland, een wetenschappelijke literatuurstudie en tien expertinterviews, geven we inzicht in welke factoren van invloed zijn op draagvlak en publiek participatie. Daarnaast geven we een overzicht van het Nederlandse beleid inzake zonneparken en hoe publieke participatie in dit beleid is meegenomen.

### Factoren die draagvlak beïnvloeden

Aan de hand van het energierechtvaardigheid raamwerk (Mundaca e.a., 2012) en de participatieladder (Arnstein, 1969) hebben we verschillende relevante factoren onderscheiden voor respectievelijk draagvlak en publiek participatie. Het energierechtvaardigheid raamwerk omvat onder meer een rechtvaardige distributie van kosten, baten en risico's en een rechtvaardige betrokkenheid bij procedures (de juiste informatie op het juiste moment en met lokale kennis). De input van de interviews is op dit raamwerk gelegd. Daarnaast is de participatieladder gebruikt om onderscheid te maken tussen verschillende niveaus van participatie: van informeren tot co-creëren. Hoe deze factoren van invloed kunnen zijn wordt in het rapport beschreven. Verder hebben de interviews inzicht gegeven in de betrokken partijen vanuit de sector, het beleid, lessen vanuit windenergie en verschillende typen initiatiefnemers.

### Draagvlak in beleid en richtlijnen

De SDE+ subsidie is op dit moment het enige nationale beleidsinstrument voor zonneparken. De subsidie stelt echter geen eisen wat betreft draagvlak of lokaal eigendom. Verschillende partijen stellen voor om onderzoek te doen naar de mogelijkheid van een eis voor burgerparticipatie in SDE+ aanvragen. Het beleid voor zonneparken is echter gedecentraliseerd naar lokale overheden. In de praktijk betekent dit dat de meeste gemeentes afzonderlijk aan hun beleid werken. Op deze manier zouden burgers meer invloed kunnen hebben, maar het zorgt ook voor veel variatie in eisen per project en per gemeente. Lokaal beleid zou verbeterd kunnen worden als gemeenten aspecten overnemen die bij andere gemeenten goed werken. De invoering van de regionale energiestrategieën (RES) in 2019 zou hier aan bij moeten dragen. De RES zet mogelijk wel extra (tijds)druk op kleinere gemeenten, die vaak weinig capaciteit hebben om aan de portefeuille duurzame energie te werken.

Hoewel er verder geen nationaal beleid is, bestaan er verschillende richtlijnen die ervoor zorgen dat burgerparticipatie en draagvlak aandacht krijgen. Zo wordt in het concept Klimaatakkoord de 50% lokaal eigendom maatregel voorgesteld. In de Wet

op de Ruimtelijke Ordening, die in 2021 gereed moet zijn, worden projecten verplicht draagvlak te verkrijgen. In de praktijk houden veel projecten al rekening met deze toekomstige wet. Tot slot bieden ook NGO's participatie en draagvlak richtlijnen voor de lokale overheden. Tijdens de interviews bleek dat verschillende experts voorstander zijn van het ontwikkelen van een gedragscode voor zonneparken (vergelijkbaar met de gedragscode voor windenergie); daar wordt al aan gewerkt.

### **Participatie bij zonneparken in de praktijk**

We hebben tien zonneparken nader (online) bestudeerd op de mate van burgerparticipatie. De twee meest opvallende voorbeelden waren parken in de gemeenten Groningen (Vierverlaten) en Raalte (Heeten). In het Vierverlaten zonnepark zijn burgers samen met de omliggende bedrijven eigenaar van het park. Hier kunnen burgers meebeslissen. Ook in het zonnepark Heeten kunnen burgers meebeslissen: via de betrokken energiecoöperatie hebben ze besloten om ruimte te geven aan het landschap. In de andere acht gevallen bleef de participatie op het niveau dat Arnstein tokenisme noemt: burgers worden alleen geïnformeerd en gehoord. Op Ameland kregen burgers wel de kans om financieel deel te nemen aan het zonnepark en was er transparante communicatie over elke stap van het project, maar burgers hadden geen beslissingsbevoegdheid.

### **Tot slot**

Wind- en zonneparken zijn de meest voor de hand liggende technologieën om de regionale en lokale doelstellingen voor duurzame energie te bereiken. In één van de interviews werd aangegeven dat de windenergiesector heeft moeten leren om de samenleving inspraak te geven in het proces en ontwerp van een project. De markt voor zonneparken is nu waar de windenergiemarkt tien tot vijftien jaar geleden was, waarbij de verhoogde burgerparticipatie bij windparken een les zou moeten zijn voor zonneparken.

Vanuit het energierechtvaardigheid perspectief blijkt dat de steun van een gemeenschap voor een zonnepark door een factoren wordt beïnvloed die verder gaan dan het zogenaamde NIMBY-effect. Erkenning van de gemeenschap en aanhaken bij lokale behoeften worden hier genoemd. Het blijkt dat de mate van burgerparticipatie per project en per projectontwikkelaar kan verschillen. Zo zijn er variaties in het aanbod van financiële participatie, zoals lokale fondsen en verplichtingen, het aanbod aan opties om parken in te richten, en in hoeverre ecologie een rol kan spelen en bewoners daar over worden gehoord. Er lijkt echter een verschuiving gaande om bewoners eerder in het proces te betrekken en parken meer samenwerking met omwonenden te ontwerpen. Hierbij vormt de zo omschreven participatie paradox een serieuze uitdaging: zowel bij het vroeg als wat later in het proces betrekken zijn kanttekeningen te plaatsen. We gaan volgen hoe zich dit ontwikkelt in de praktijk. Tot slot blijkt burgerparticipatie een grotere rol te krijgen in beleid. De meeste betrokken partijen zijn op de hoogte van deze veranderingen en zien in dat ze daar meer en meer mee te maken krijgen.

## Summary

The development of land based photovoltaic solar parks, hereafter solar parks, has boomed in the Netherlands in the last few years. According to the latest estimations based on the SDE+ data from the RVO, 67 parks (both roof- and land based) have been realized up to and including 2017 (zonopkaart.nl, 2018). In addition, there are plans to set up over several hundred more parks from 2018 onwards. The experience with spatial (energy) projects, especially with wind turbines, shows that local residents can be supportive but also very resistant towards a project in their neighbourhood and residents can so to speak 'make or break' a project. We were curious to know how and on what grounds the public currently supports solar parks. The aim of this research therefore was to achieve a deeper understanding of the current attention for public support and public participation in land based solar park projects in the Netherlands. In the frame of energy justice and by means of a literature review, case examples and expert interviews, we provide insight in which factors are of influence on public support and how local residents are involved in solar park projects. In addition, we provide an overview of Dutch policies on solar parks and how public participation is adopted in these policies.

### **Factors influencing public support and participation**

At the start of our literature review we highlighted a number of frameworks aimed at explaining public support or acceptance for sustainable energy technologies. For example, Huijts et al. (2012) showed that technology acceptance is among other things influenced by a person's attitudes and norms, that in their turn are affected by feelings, and perceptions of costs, benefits and justice. According to the ground-breaking publication Arnstein (1969) the organization of the participation process and how much influence the public has in these processes is most important. Her well-known participation ladder distinguishes low levels (like informing) and high levels of involvement (like co-creation). From another approach, Mundaca et al. (2018) focused on public participation from the perspective of a just distribution (costs, benefits and risks) and a just involvement in procedures (having the right information at the right time, and involving local knowledge). The participation ladder and the energy justice framework seemed most applicable for our review, since we expected to find information on public participation process surrounding solar parks, but not so much on individual aspects like attitudes or norms. In this report we therefore focus on the energy justice factors on distribution and procedures as a guideline.

### ***Distribution of benefits, costs and risks***

From the literature it becomes clear that positive impacts or benefits from renewable energy projects are lower energy prices, ownership, sustainability, job generation, energy security and independence, industrialization and increased property values (e.g. Carlisle et al., 2016). While the main costs are the aesthetic impact, land use, electricity costs, reduction of cultivable land and ecological impact (e.g. Roddis et al., 2018; Chiabrando et al., 2009). These costs and benefits were also mentioned during the expert interviews.

However, in some cases of solar parks, certain groups may benefit more than others and the allocation of benefits and costs can be problematic (Mundaca et al., 2018). For example, a survey in the U.S. found a majority of residents that believed

solar park projects will decrease the value of their property (Carlisle et al., 2015). Moreover, this majority felt that one party, project developers, profited too much from low-cost government leases of public land and which led to a drop in public support. Several interviewees state that landowners indeed have more advantages than local residents, but that this is fair when landowners are taking the investment risk and must make a profit. However, the interviewees state that in the eyes of the local residents, the project developers sometimes enrich themselves at the expense of the aesthetics of their environment. Furthermore, when a government has a strong focus on rapid installation, they might overlook the indirect costs that consumers may have to bear (e.g. grid integration costs are sometimes allocated to consumers). This can cause local residents do not feel benefitted or acknowledged with the solar park (Sareen & Haarstad, 2018). Solar parks on non-agricultural land and smaller projects in general are regarded as more acceptable by communities (Roddis et al., 2018). This is reflected in the interviews, as smaller projects are usually initiated by energy cooperatives that involve the social factor early in the process.

#### *Financial participation*

From the interviews it became clear that as space for solar parks becomes increasingly scarce, more disadvantages are emerging. Financial participation is often seen as a building block to balance these disadvantages for energy projects like solar park projects, as public support would increase when local residents financially benefit from the project. Financial participation varies greatly from area to area and must fit the business model and this is becoming more difficult now. At present, local residents can invest in solar park projects but the question remains if all residents who want to participate are able to. This puts a different light on the discussion whether or not you should include a certain percentage of participation by local residents (20%-50%) on the solar park projects. Some interviewees indicated that it is still too early to draw conclusions on which financial participation methods work best and what results the different methods yield. But in general, solar park projects that are developed by most types of energy cooperatives have a positive influence on public support and financial participation compared to other initiators.

Financial participation can also backfire when residents get the feeling of not being acknowledged in their personal connection and history with their environment. The importance and understanding of the current situation and the historical context of a location is not be underestimated. If this is not acknowledged, financial participation or compensation can be perceived as a bribe. This tends to be very location and context depended. According to an interviewee the best way to do this, is that municipalities select certain areas in consultation with their citizens.

#### *Location*

According to the well-known not-in-my-backyard (NIMBY) concept, support for renewable energy projects depends on the physical distance between the community and the project. However, various researchers state that other factors than NIMBY are more important (e.g. Wolsink, 2000). For instance, Roddis et al. (2018) describe the influence of aesthetic impact on natural sites, biodiversity conservation, the impact on agricultural production and tourism, the project size, social deprivation of local area and exposure to renewable energy infrastructure as important factors for support. They found that aesthetics and visual impacts are

significantly associated with outcomes of project planning for both wind and solar parks (Roddiss et al., 2018).

Späth (2018) also showed that the argument of an inappropriate use of land led to opposition in Switzerland: in this case the land was meant for agriculture and residents opposed to using this land for solar parks. It seems that a solar park on a wasteland does create more support in comparison to an agricultural area with high food production. The positive influence on public support for multiple land can be seen at the Woldjerspoor solar park in Groningen, located in a former waste disposal site where electricity is supplied to a hydrogen station.

### ***Consultation of citizens in procedures***

It is crucial for citizens to receive adequate information at the time that benefits them to the most. For example, the classic method of an information evening may not always be suitable, as it mainly involves solely sending information and this attracts citizens that are already engaged in the first place. Several interviewees stated, a balanced more interactive method is preferred, because on the one hand projects that are not sufficiently worked and communicated at an early stage unable citizens to make an informed judgement where they are not taken seriously. On the other hand, if they are informed later in the process when the plan is more elaborated, highly detailed projects might cause local residents to feel less involved because everything is already defined and there is a perceived lack of involvement. This is also referred to as the *participation paradox*.

Following Arnstein's ladder, participation can go to different levels compared to just informing people. There are various examples of how applying deliberative processes and involving different perspectives can lead to successful projects. For example, in Tamera 'solar village' in Portugal there is strong support for a) technological innovation, b) a will towards energy autonomy and c) commitment to share knowledge and eco-friendly technologies within a small community (Sareen & Haarstad, 2018). In Switzerland significant differences on perspectives and views from different actors on energy and land use policies, highlighted the need for an inclusive planning process. The views of respondents diverged regarding the path toward high shares of solar energy: some emphasized the role of citizens in the development of renewables, others highlighted the protection of agricultural land or the pragmatic development of solar parks on areas that are easier to build, and finally others stressed the larger role of energy saving than to increase renewable energy production (Späth, 2018). Also during the interviews it was mentioned that there is a discrepancy between how decision makers look at a project from a general point of view, trying to cooperate in something that has worked in previous projects. While residents look at a broader set of issues, like the historical frame and their attachment to a place. Involving residents with specific knowledge, like the example of an ecologist living in the area, could be organized to a higher degree in the Netherlands.

Some provincial governments are evaluating their solar park guidelines to see how they can include the community better. The interviewee from the national government proposed the option to not just let a project developer advocate for a solar park, but to have multiple options available for the community to choose from. Another idea would be to require an Environmental Impact Assessment (EIA) for solar parks. However, an interviewee from a consultancy firm emphasized that these kind of requirements may be imposed on projects, but 'we must be careful

that these requirements do not lead to less solar park projects being realized because of more institutional constraints'. Too many variations in requirements per project increases the uncertainty for the initiators and this goes at the expense of standardization and thus the scalability.

Consultation of citizens is a delicate matter, as there are examples of it leading to unjust situations. For example, in Great Britain the public is given the opportunity to provide their views on planning applications to the Local Planning Authority (Roddis et al., 2018). Through this consultation process, citizens and other interested actors can highlight arguments to decision-makers in relation to a project either supporting or opposing its development. It proved that areas with higher social capital are more successful at opposing unwanted projects due to greater capacity to engage and access to networks. Hence, wealthy communities are better represented in official planning processes and as a result, some types of renewable energy developments are becoming concentrated in deprived areas of Great Britain (Roddis et al., 2018).

### ***Type of initiator***

There are different type of initiators of solar park projects, namely: individual initiators, energy cooperatives, commercial project developers, and municipalities (RVO, 2016). These initiators usually determine the location of the project. During the interviews it became clear that most of the time, a solar park project starts with an initiator approaching a landowner. This land can be owned by the municipality, but a local agricultural entrepreneur as a landowner is the most common case in the Netherlands. Energy cooperatives aim for the highest degree of community engagement, but they usually develop small scale projects because of a relatively small organization and insufficient resources. The large scale projects tend to have less support from local residents, these tend to be developed by commercial project developers. The community dissatisfaction with these parties is generally based on less investments in the local communities resources. Furthermore, the historical and cultural contexts can play a role. One interviewee gave the example of a landowner who did not have a good relationship with a small group of the local community living next to proposed solar park. This group felt diminished in earlier encounters by the landowner, which led to long delays in the permit process.

### **Policy and guidelines influencing public support**

The current state of the Dutch policy on land based solar parks is decentralised. Partly driven by the resistance surrounding larger wind parks, it was decided to shift the authority from a provincial governmental level to a local level. The status amongst many municipalities is the absence of policy on land based solar parks.

With the absence of national policy guidance for solar parks, various ways were found to provide guidelines on how to incorporate public support. One of the drivers in the Netherlands is the Climate Agreement, that describes public participation as an important requirement, resulting in measures such as the 50% local ownership of renewable energy production rule for the local community. Several interviewees stated that this measure can impose a real challenge from a community willingness perspective and the available (financial) means to enhance the community support. Another driver is the Spatial Planning act, due in 2021. This act makes public support mandatory for projects like land based solar parks, but it explicitly does not provide guidelines on how to enhance participation. The act does provide an inspiration guide with examples of projects with participation means. In practice,

many projects take participation into account and work in line with this future act. Furthermore, the NGO's provide guidelines for provincial government.

The rapid changes in the last few years in the solar park sector have evoked political reactions: a motion on a so called solar ladder in the House of Representatives. Based on the expected location preferences earlier, the national government is investigating the possibilities to construct a policy preferring rooftops over wastelands, and in addition putting agriculture lands on the last step of the ladder. Furthermore, existing policies like the Crisis and Recovery law are adjusted with amendments. At the end of 2018 the only guiding national policy is the SDE+ subsidy. The SDE+ does however not include requirements for public support or local ownership for solar parks. On the one hand, several leading parties have suggested an investigation of the ability to include public participation in the project plan as a requirement in the application of the SDE+. On the other hand, since the municipalities are the competent authority and there is move towards more decentralization with renewable energy projects, the question remains whether a national policy should directly influence local participation or that a national Code of Conduct (like in the wind energy sector) should guide this process. During the interviews it became clear that several people were in favour of developing this code of conduct for solar parks. The sector organisation, Holland Solar, was at the end of 2018 drafting such a code with the input from the several sector stakeholders.

At the end of 2018, most municipalities are working separately on their policies, which is considered positive at a local level as citizens could have more influence. However, this also brings many variations in requirements per project and per municipality, which leads to increasing uncertainty and costs for project developers as a result. Local policy can be made more efficient when municipalities would take over policy aspects that work at other municipalities. The introduction of the provincial energy strategies (RES) in 2019, in which ambitions on sustainable energy are defined per region, could make it easier for project developers as they can connect the projects to these ambitions. On the other hand, the time schedule of the RES process puts extra pressure on the municipalities who are usually understaffed, as there are often only one or two alderman responsible for the sustainable energy portfolio.

### **Cases and participation**

Finally we looked for information on realised solar parks, and selected ten cases varying in size (amount of Megawatts) and the available amount of information on public participation per case. We applied the ladder of Arnstein to make an indication of the level of organized public participation.

The two most striking examples of participation were parks in the municipalities of Groningen (Vierverlaten) and Raalte (Heeten). Citizen power is expressed at the Vierverlaten solar park, where citizens together with the surrounding companies own the solar park. The solar park Heeten also displays a certain degree of citizen power, since the citizens in the energy cooperation were able to decide on creating space for alternative landscaping.

In the other eight cases participation remained at the level Arnstein calls tokenism: citizens are informed and heard by decisionmakers. In Ameland citizens were given the opportunity to financially participate in the solar park and there was



transparent communication on every step of the project. But the citizens were not granted with decision-making power.

### **Concluding remarks**

Wind and solar parks are obvious technologies in the foreseeable future to reach the national, regional and local sustainable energy goals. In one interview it was mentioned that the wind energy sector learned the hard way to give the community a say in the design of the project. The land based solar park market is where the wind energy market was 10 to 15 years ago. The enhanced level of participation in wind parks should be a lesson for solar parks.

In this review we described a number of factors that have an effect on the level of public support for solar parks. Moreover we looked at the current practice of public participation in realized parks and in policy. We found some examples of how successful projects were developed together with citizens, like in Viervelaten, Heeten. The involvement of citizens differs per project and per project developer. Different methods of financial participation are offered like local funds and obligations, configuration options and ecological add-ons. However, it is too early to draw conclusions on which financial participation method yields the best results. A shift towards a more community centralized design seems to be at hand, but this should be in balance with market opportunities for initiators. In practice, most involved parties are aware of the policy changes at hand where participation will be one of the requirements. This is a promising situation from a just public participation point of view.

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# 1 Introduction

## 1.1 Objective

The aim of this research is to achieve a deeper understanding of the current public support, acceptance and participation for solar park projects in the Netherlands. In this study, we provide an overview of how land based solar projects deal with public support and participation by local residents. Moreover, we searched for a suitable framework that can be applied to this issue.

## 1.2 Scope

This study focuses on the public support and participation from local residents for solar park projects in the Netherlands. Solar parks entail land based photovoltaic (PV) solar panels that occupy a certain ground surface area (either small or large scale) in urban or rural areas. There is no standard in the amount of panels installed or acres of land used. The solar park may supply power at the utility level or to a local user or users. Roof-based solar panels are not included in this study.

## 1.3 Research questions

- 1. Which factors determine public acceptance of solar park projects in the Netherlands?*
- 2. How are local residents involved in the development of solar parks in the Netherlands?*
- 3. How does current policy and context in the Netherlands impact participation by local residents in the development of solar parks?*

## 1.4 Methods

### *Literature review*

A literature review is carried out over recent scientific studies (>2009) for land based solar parks within and outside the Netherlands, including social factors. Some of the main concepts that are linked to these factors and solar parks are: energy justice, social acceptance and public participation (see section 1.5).

### *Theoretical framework*

As part of the literature review, we search for a framework that is compatible with the aim of the research and contributes in answering the research questions. This framework is further used for the analysis and categorisation of the scientific studies and for the insights drawn from the expert interviews.

### *Desk research*

In an inventory of solar parks in the Netherlands, we took the website [www.zonopkaart.nl](http://www.zonopkaart.nl) as a starting point. A web search was conducted as a next step, whereas each realized project was screened on support, acceptance and participation by local residents. The Arnstein (1969) ladder of participation provides

an overview of the used category framework (see section 1.5). The projects are divided in three category sizes (small, medium and large solar parks).

#### *Expert interviews*

To complement the information obtained from the literature review and desk research, and to achieve a deeper understanding of the current situation in the Netherlands on public support, participation and energy justice on solar parks, 10 semi-structured interviews are held with eight different type of stakeholders. Other topics such as Dutch policy and financial participation are also included in the interview protocol.

#### *Interview protocol*

The interview protocol is based on the chosen framework for this study i.e. energy justice framework (see section 2.1 and Annex I). Here, the questions in the interview are based on the components of energy justice. The additional questions were asked to get an insight in current state of the policy, the different initiators of solar parks and the comparison between wind parks and solar parks (see Annex II).

#### *Stakeholder selection*

The stakeholders selection was based on the document 'Grondgebonden zonneparken' (RVO, 2016) that provides a framework for initiators, grid operators, interested parties and citizens in their view on land-based solar parks. Together with an exploratory conversation with one of the authors of the document, a list with stakeholders was selected. This was expanded with the network from ECN part of TNO. Once the first interviews started, a snowballing technique was applied to complete the list and provide us with the 10 interviews that fitted within the scope of this research (see Annex III).

## **1.5 Main concepts**

#### *Social acceptance and support*

According to Huijts et al. (2012), "acceptance reflects behaviour that enables or promotes (support) the use of a technology, rather than inhibits or demotes (resistance) the use of it." Support is then referred to the proclaim of the technology (e.g. based on its environmental benefits), or to use or purchase the technology (Huijts et al., 2012). With the introduction and implementation of renewable energy technologies, such as solar and wind, recent experience shows that social support is one of the several challenges in the process. Previous cases have shown that social support for renewable energy technologies cannot be taken for granted and social acceptance can represent a major obstacle for the implementation of these technologies. In particular, renewable energy sources with visual impact such as wind energy, have struggled to gain social acceptance and have become a subject of many debates in several countries.

According to Wüstenhagen et al. (2007), social acceptance can be distinguished in three dimensions: socio-political, market and community acceptance. In this study, we focus on the latter form of social acceptance. Community acceptance is referred to the acceptance of decisions and renewable energy projects by local stakeholders such as residents and local authorities. It is closely related to the not-in-my-backyard (NIMBY) concept, which explains that the support for renewable energy projects is dependent on the distance between the community and the physical

presence of the technology like a wind turbine. This NIMBY effect is debated though (e.g. Wolsink, 2000), since others have found an opposite effect where citizens showed more support when a technology was near their home. Another component of community acceptance is progression of the support during the project. Wolsink (2007) showed that this process with wind turbines follows a U-shape, with a high level of acceptance at the beginning of the process, following lower acceptance at the implementation phase before it goes up again when the technology is implemented and running.

#### *Energy justice*

Energy justice is perhaps best described by Sovacool & Dworkin (2015) as ‘a Global energy system that fairly disseminates both the benefits and costs of energy services, and one that has representative and impartial energy decision-making’ (Sovacool & Dworkin, 2015). Justice scholars have focused on the social science component of energy, looking for a more human centered exploration of energy systems (Sovacool, 2013). These features make energy justice useful when analyzing community acceptance, social support, and public participation. Furthermore, energy justice implies “choices about what kinds of energy systems to build for the future, where to build them, and how to distribute their benefits, costs, and risks” (Miller, 2012). In line with the practical approach of Mundaca et al. (2018), this research focuses on two primary tenets of energy justice: procedural and distributional justice. These tenets can give some valuable insights into community acceptance (Wüstenhagen et al., 2007), and give the ability to evaluate which affected sections of society are ignored, where these injustices appear and what can be done to remediate them in order to be reduced (Jenkins et al., 2016).

Distributional justice aims to acknowledge injustice by using a geographic approach. From both energy production as consumption, it represents a preference for the distribution of the benefits and ills on all members of society, regardless of income, race etc. (Jenkins et al., 2016; McCauley et al., 2013). It thus tries to answer: ‘How are costs and benefits shared?’ (Gross, 2007). Procedural justice is best explained as ‘fair procedures that involve all stakeholders without discriminating them’ (McCauley et al., 2013 as referred to in Walker, 2009; Bullard, 2005).

#### *Public participation*

Arnstein (1969) links public participation to a shift of power that includes citizens in important processes of social reformation. It thus gives citizens the opportunity to be part of information disclosure, policy formation and goals, and benefits from these processes. This is further elaborated in a ladder of participation that described eight rungs in three levels, from ‘citizen control’ as the highest degree to ‘manipulation’ as the lowest degree of participation (see Figure 1).

The bottom level is non-participation where citizens are excluded from any kind of participation. Next is the tokenism level where the conditions for citizens have been improved, but the fact that they are heard and allowed to have a voice does not imply that anything will be done with their stance. This is due to the lack of power granted by the decisionmakers (Arnstein, 1969). In the highest and third level of citizen power citizens have the means to actually engage in negotiations with the decision makers.

Including the public can diminish the role of bureaucratic way of decision making by emphasizing on self-governance and giving the community the chance to react to decisions made by the authorities (Skelcher, 1993, in Tosun, 2000). Furthermore, it can enhance the legitimacy of decision making by including a wider spectrum of opinions and values, hereby decreasing the margin of error and contributing the quality of a decision (Fiorno, 1990).

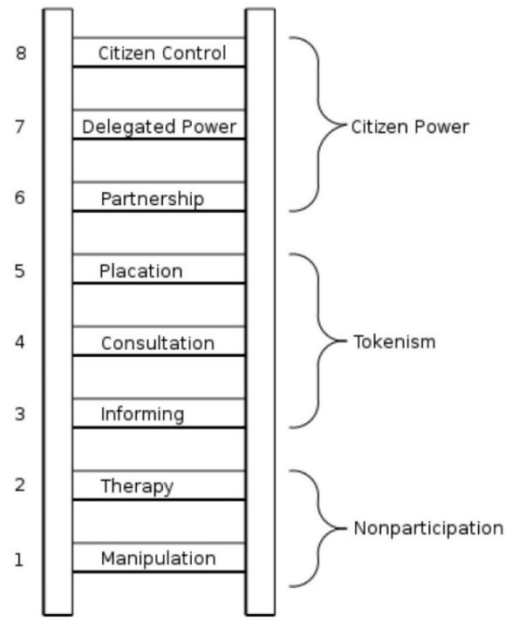


Figure 1. Arnstein (1969) Ladder of participation

## 1.6 Structure of the report

The present report starts with the literature review of solar park projects within and outside the Netherlands in the frame of energy justice, public support and social acceptance (see Chapter 2). Chapter 3 gives an overview of the current state of solar parks in the Netherlands including Dutch policy, main stakeholders, types of initiators and realized solar park cases. In Chapter 4, insights from the expert interviews are used as input for the energy justice framework. The report ends with conclusions (Chapter 5) and some points of discussion (Chapter 6).

## 2 Literature review

This chapter consists of a literature review of scientific studies for solar parks on which social factors played a role, whereas concepts such as energy justice, social acceptance and/or participation were involved. We focus on the energy justice framework to analyse the literature on this topic since this provides a way to analyse community acceptance, social support, and public participation. Firstly, the energy justice framework is described (section 2.1), and secondly, insights from scientific studies are categorized based the components of the energy justice framework (section 2.2).

### 2.1 Description of the framework

We decided to apply a framework to analyse and categorise the insights gained from the literature review. As described above, energy justice provides an insight in a more human centred exploration of energy systems. Since this research focuses on the novel subject of land based solar parks, a hands-on approach that was tested in practice was needed. In the energy justice literature, Mundaca et al. (2018) provide such a framework where distribution justice focuses on the outcomes of a project and procedural justice on decision making, consultation processes and information flow. They tested the framework by looking from a community perspective on energy justice in successful local energy transitions. This framework provides the desired practical approach in line with the research questions of our research. Most energy justice frameworks add recognition as a third tenet from energy justice, in addition to the two tenets procedural and distributional justice (McCauley et al. 2013; Finley-Brook & Holloman, 2016). Even though this research acknowledges the importance of this third tenet as it is strongly linked to the justice perception of communities, this tenet will not be part of the framework since we aim for a more hands-on approach with a focus on categorization. Furthermore, the scope and timeline of the current research requests some adjustment of the Mundaca et al (2018) framework. The procedural justice focus will be the information flow whereas distributional justice is centred around the costs and benefits as outcomes (see Figure 2).

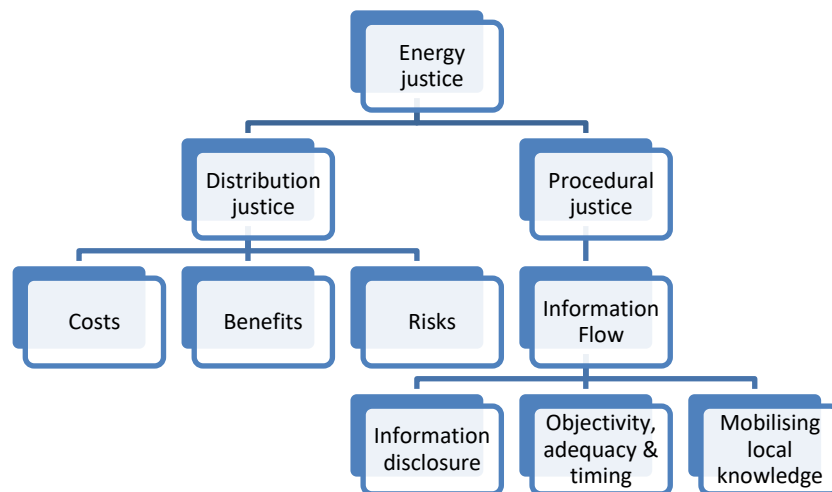


Figure 2. Adapted energy justice framework (Mundaca et al., 2018)

### *Distributional justice*

The energy justice framework of Mundaca et al. (2018) divides distributional justice in the outcomes costs and benefits and looks at the distribution, the allocation of responsibilities and potential risks. The scope of this research allows us to see how distributional justice deals with the consistency of the allocation of the outcomes of the solar park projects (how are costs and benefits divided). The distribution of cost and benefits could lead to the following examples of (in)justice with this kind of low carbon technology: ownership, the location of infrastructure, energy carriers, access to energy services, the energy costs, investment costs and profits (Mundaca et al., 2018).

### *Costs*

The cost of a new application of a sustainable energy source, like a solar park, can be an environmental, financial or social one. An example are the costs that a society has to make to transform its energy system. The Energiewende in Germany shows that society has to pay at least a part of energy transition through a higher price for energy consumption (Jenkins et al., 2016). Other social costs, specifically for solar parks, include the sacrifices that the community perceive when it comes to aesthetics. An example of environmental costs is the potential change to an ecosystem (Späth, 2018).

### *Benefits*

The benefits of newly introduced energy services can include the ownership of these services by the community (Mundaca et al. 2018). Since solar parks are constructed for at least 15 years, these type of projects are accompanied by long term financial benefits that might lead to more social acceptance. Other advantages entail higher job security, energy independence and higher energy security. The environmental benefits can include a positive image of a community and an emission reduction.

### *Procedural justice*

Procedural justice (fair procedures that involve all stakeholders without discriminating them) has an effect on several aspects of the information process of



a community in the phase before realization of a project. The ability to be heard, institutional representation of the involved stakeholders and access to consultation can be seen as the foundation for a fair consultation process (Jenkins et al. 2016; Mundaca et al. 2018). As part of this process, information flow towards the affected stakeholders is essential and will be the point of focus for the current research. Information disclosure, objectivity, adequacy, timeliness and mobilization of local knowledge are the justice based concerns for information sharing (Mundaca et al., 2018).

#### *Information disclosure*

Acceptance is often guided by the disclosure of information towards the affected citizens by the government, the project developer or industry involved. This together with a certain level of empathy and the right amount of engagement can lead to social acceptance (Miller et al., 2015). Furthermore, the access to information is known to foster social stability and enhance democracy (Mundaca, 2018). An example is governments that include public consultation as part of their energy strategy (Jenkins et al. 2016). Other examples of disclosing information are the publication in letters, local newspapers and availability in local libraries (Mundaca et al., 2018), or online sources.

#### *Objectivity, adequacy and timing*

The flow of information should strive for a level of objectivity, where the sources of information should be divided amongst opponents and proponents. Information sharing by trusted sources can enhance this objective stand (Mundaca et al. 2018). The adequacy of information can be expressed by the scope, so is there enough information available of sufficient quality? In addition the timeliness or timing of providing information is crucial for a more just information flow and should be linked to the phase of the process at which the stakeholders are consulted. A stakeholder should be consulted in the phase of the project where the information is most useful for them.

#### *Mobilizing local knowledge*

New technologies demand a timely and sufficient overview of the benefits, costs and risks. Mobilizing and using local knowledge influences the information flow and can be critical in mobilizing a community (Mundaca et al., 2018). This local knowledge is not always maximally utilized, while it can motivate communities by engaging them and using their local know-how. This can be done physically, but also by using data available of the population of that specific environment. Jenkins et al. (2016) provide an example where geophysical data is used to provide insights in the livelihoods in the local community from that shows an inherent sensitivity to ecosystems.

## **2.2 Studies on solar parks**

A literature review was carried out on solar park cases in industrialized countries with a focus on social factors that played a role to gather insights on energy justice in solar park projects and to assess to what extent this topic is addressed in current literature available. The main insights have been divided into the main categories of energy justice described in the section above, i.e. distributional and procedural justice.

### *Distributional justice*

In solar energy projects, distributional injustice involves the risks, costs and benefits of the project perceived by the community (this included (potential) social and environmental impacts), which in turn influences community acceptance. Positive impacts from renewable energy projects in general are lower energy prices, ownership, sustainability, job generation, energy security and independence and industrialization amongst others (Carlisle et al., 2016). In some cases, certain groups may benefit more than others and the allocation of benefits and costs can be problematic (Mundaca et al., 2018). Significant variables that influence community acceptance for solar parks in particular, are the aesthetic impact on natural sites, biodiversity conservation, the impact on agricultural production and tourism, the project size, social deprivation of local area and exposure to renewable energy infrastructure (Roddis et al., 2018).

An example of how the community perceived distribution of benefits and costs is the Amareleja solar park in Portugal (Sareen & Haarstad, 2018). This case shows how large-scale solar parks may pose socio-technical issues regarding the spatial concentration of generation capacity and the allocation of the burden costs of grid integration onto project developers or consumers. Here, uncertainties on the creation of potential domestic manufacturing activities, local jobs, people's awareness and involvement on decision-making left citizens with relatively limited influence. From the citizens perspective, the government seemed to focus on rapid installation and less on the indirect costs that consumers may have to bear to indirectly off-set investments in grid integration infrastructure. Even though the project was successfully implemented, Amareleja's residents do not feel benefitted nor satisfied with the solar park. This represents an example of injustice in the consistent allocation of costs and benefits for Amareleja's residents.

Another example of the distribution benefits and costs is a study from Carlisle et al. (2015), where they undertook telephone surveys to examine attitudes towards large-scale solar parks in the U.S. They found that a majority of respondents believed that these projects will decrease property values and include low-cost government leases of public land to project developers, which in return had an influence on the public support of US citizens on solar panels. In another survey study in the U.S., Carlisle et al. (2016) show that when developers guarantee that the solar park will not be visible to the respondent, support increases. Also, survey respondents showed concerns about the impact on wildlife. The visual impact on the components of the landscape, reduction of vegetation and the sunlight reflection represent a transformation of the territory (Chiabrando et al., 2009).

Aesthetics and visual impacts are significantly associated with outcomes of project planning for both wind and solar parks, however specifically more for onshore wind because of its stronger visual signature (Roddis et al., 2018). However, Miller (2012) argues that meeting the energy demands of the future will ultimately require building on wild lands while rural residents complain that solar and wind projects alter rural landscapes largely for the benefit of urban communities (Miller, 2012). Not only citizens can oppose to solar parks; Späth (2018) studied how affected stakeholders perceived the development of solar parks using the Bouverie solar park case in Switzerland as an example of the tension between land use and large-scale solar parks. The case involved a solar park of about 40 hectares of PV panels located in an industrial zone that was still used for agriculture. This caused

opposition from an NGO arguing the inappropriate use of land. Additionally, a study from Chiabrando et al. (2009), shows that medium and large solar parks represent not only land use but also a reduction of potentially cultivable land. This perspective makes solar parks likely to be seen as competitive with food production. Solar parks on non-agricultural land and smaller projects in general are regarded as more acceptable for communities (Roddis et al., 2018).

#### *Procedural justice*

Procedural justice is referred to as the processes and elements of decision-making, aiming to engage all stakeholders in a non-discriminatory way. In communities, key aspects include the mobilization of local knowledge, information disclosure and institutional representation. An intensive consultation process can force all stakeholders to share information and find a consensus (Mundaca et al., 2018). An example of the consultation process is the case of the United Kingdom (Roddis et al., 2018), where the public is given the opportunity to provide their views on planning applications to the Local Planning Authority (LPA). Through this consultation process, citizens and other interested actors can highlight material arguments to decision-makers in relation to a project either supporting or opposing its development. The consultation period usually lasts for 21 days, where the LPA consults different groups and afterwards makes the decision to grant (with or without conditions) or refuse permission. In the United Kingdom, applications are more likely to be approved in areas that are systematically under-represented in formal planning processes. For instance, areas with higher social capital are more successful at opposing unwanted projects due greater capacity to engage and access to networks. Hence, wealthy communities are better represented in official planning processes and as a result, some types of renewable energy developments are becoming concentrated in deprived areas of Great Britain (Roddis et al., 2018). This also shows how demographic variables may also influence the extent to which residents take action on renewable energy projects in their local area.

In Canada, a government-owned electricity company conducted stakeholder engagement workshops for the development of programs solar energy programs (i.e. 6 workshops that discussed the guiding principles for solar energy programs based on energy justice) (Dolter & Boucher, 2018). The workshops highlighted that solar energy programs, consisting of roof-top and land based solutions, should be designed to enable community participation and empower local ownership. In terms of information sharing, participants made clear that the company should provide pro-active customer education to increase 'energy literacy' with information on costs and benefits of solar energy in comparison with other generation sources. This could be done for example, by including information at regular bills or partnerships with public institutions. The principle of pro-active education was mentioned in all the workshops undertaken and is part of the energy justice 'good governance' dimension, calling for high-quality information made available to citizens.

This study above resembles the adequate information part of the energy justice framework from Mundaca et al. 2018, where plenty information of sufficient quality is requested. Participants also requested on-going engagement of the programs, including youth engagement, and to continue to engage industry and solicit public opinion and feedback. They also stressed their need for community participation, in terms of ownership and solar energy programs. These should be accessible to all, independent of their location or project size, including a financing program for those

who cannot afford solar energy (Dolter & Boucher, 2018). This would allow increased transparency and accountability where public views are used as an input and a transparent report is disseminated. This is reflected in a community-level case in Tamera 'solar village' in Portugal comprising a set of sub-100 kWp set of solar projects (Sareen & Haarstad, 2018). This case shows how the strong support for technological innovation, a will towards energy autonomy and commitment to share their knowledge can bring eco-friendly technologies alive within small communities. Here, taking deliberative decision-making from energy justice effects like local knowledge sharing led the way to technological innovations.

Furthermore, to ensure a fair process, the decisions for the energy system must be based on inputs from citizens and stakeholders from different backgrounds and points of view. For the realization of the Boverie solar park in Switzerland, a participative process was established where the municipality, the local electricity company and the project initiator involved stakeholders and NGOs. This involved a public inquiry where opposition can be established and modifications to the project can be carried-out. Despite these efforts, in this case, the planning process did not run smoothly due to opposition from an NGO over tension between land use and energy strategy. Significant differences on perspectives and views from different actors highlighted the need for an inclusive planning process, as substantial differences were found between what energy and land use policies should be. The views of respondents diverged regarding the path toward high shares of solar energy: some emphasized the role of citizens in the development of renewables, others highlighted the protection of agricultural land or the pragmatic development of solar parks on areas that are easier to build, and finally others stressed the larger role of energy saving than to increase renewable energy production (Späth, 2018). They expect that these underlying tensions will grow, especially in densely populated countries and recommend the body of research on social aspects in combination with large-scale solar parks to expand. Policy makers should investigate how to incorporate the broad scope of stakeholder expectations.

The above review shows that there is no uniform approach to study solar park cases on public support.

## 3 Current state of solar parks in the Netherlands

In this chapter, we take a deeper look into the current state of solar parks in the Netherlands. Here, we introduce details regarding the Dutch policy that has an influence on the implementation and development of solar park projects in the country (section 3.1), we also map out the main stakeholders (section 3.2) and describe the different types of initiators for solar parks (section 3.3). Section 3.4 consists of an inventory of realized solar park cases in the Netherlands whereas each case was screened in terms of public support, acceptance and participation. Only the cases with online information available (e.g. online articles, newspapers, weblogs) were included in this report.

### 3.1 Dutch policy and guidelines

This section gives an overview of the Dutch policy instruments and guidelines that impact the solar park sector. This research has a particular focus on the role of public support and participation and the way these instruments and guidelines contribute to this.

#### *Stimulation of Sustainable Energy Production (SDE+)*

The SDE+ scheme is a feed-in premium initiated by the Ministry of Economic affairs and Climate Policy to promote the renewable energy supply in the Netherlands. It compensates solar energy producers for the difference between the reference unit price of fossil energy based references and estimated solar energy for a period of 15 years (RVO, 2016). Companies and (non-profit) institutions that produce renewable energy can apply for the SDE+ subsidy scheme. Only projects with a large-scale energy connection (>15 kWp) are eligible to this subsidy. The subsidy scheme is intended for renewable energy technologies and is subdivided into the categories biomass, geothermal, water, wind (land, lake and dike) and solar energy (both PV and solar thermal) (RVO, 2019). For solar park projects to be considered for this subsidy it needs to comply to a couple of practical conditions. There must be an environmental permit under the law of 'algemene bepalingen omgevingsrecht'. For a solar park bigger than 0,5 MW, a feasibility assessment centred around financial and technical conditions is required. The environmental permit nor the feasibility assessment or any other of the SDE+ requirements include public participation or a guideline towards community communication. The SDE+ scheme will be replaced by the SDE++ scheme from 2020 onwards, which is different because it sustainable energy techniques will no longer compete on a basis of produced sustainable energy but on the avoidance of CO<sub>2</sub> emission. The techniques with the most cost-effective measures for CO<sub>2</sub> measures are to first to be considered for the subsidy.

#### *Motion for a national framework for solar energy*

The Dutch House of Representatives has recently voted in favour of a motion to create a national framework on where solar energy should be developed. This so called national solar ladder should assist provinces and municipalities in where large scale solar projects are desired. The motion acknowledges that all provinces and municipalities have their own set of values in spatial planning and that participation is not yet sufficiently dealt with. It asks the national government to collaborate with the local and provincial government in compiling a solar ladder

where roofs and industrial sites are preferred and nature, agricultural and rural sites are spared as much as possible. The motion wants this policy instrument to be embedded in the environmental act, due in 2021 conform the participation standards proposed in this future act.

#### *Ladder for Sustainable Urbanization*

The Ladder for Sustainable Urbanization is often interpreted as an instrument that can be used for solar parks. But as the motion of the House of Representatives describes, this ladder is meant for houses, offices and shops and does not imply solar parks. The original policy article ( Environmental planning act, 3.1.6 lid 2, 2012, [overheid.nl](http://overheid.nl)) describes the following steps in order of preferred to least preferred location: roofs - urban road - industrial sites - landfills - strategic soil - edge of built-up areas - farms inheritance - along infrastructure, such as ramps and exits - former landfills - agricultural land (dual use) - agricultural land (mono use) and nature sites. The latest adjustments (July, 2017), takes away the stepwise approach and focuses on a motivation from the initiator why the project cannot have the same effect with the urban area as it does in the rural area.

#### *Solar Ladder – Solar Fan – Holland Solar*

Holland Solar presented a Solar Ladder in 2017 with an updated version in 2018 (Holland Solar, 2018). This has become a leading guideline in the field of solar energy. The solar ladder motion in the house of representatives is based on these types of guidelines. The ladder indicates the order in which different roof and ground areas in the Netherlands must be used when it comes to the realization of solar energy projects in particular. Several provincial governments and NGO's have built on this ladder or created their own version. This research has focused on the Holland Solar ladder, where three categories are distinguished:

- Category 1 – Roofs: Roofs of houses, businesses and (semi-) governmental institutions.
- Category 2 – Wastelands: Grounds that concern the double use of space such as the cover of parking lots, solar panels on water basins and water without function, and the space available along Dutch infrastructure such as roads, dikes and airports.
- Category 3 – Temporary land: Land for industry, housing or agriculture that can be temporarily (i.e. for several decades) designates for the realization of ground-based solar parks.

An important note is that Holland Solar emphasizes on all three categories as important for reaching the climate targets. This implies an approach of and/or not either/or. Their 'Solar Fan' builds on this philosophy (see Figure 3). It shows an estimation of the needed land use for solar panels. In addition, it implies that when land based solar parks are constructed, the area has to promote solar panels on roofs as well. Neither the Solar Ladder nor the Solar Fan mention any guidelines on how to enhance public support.

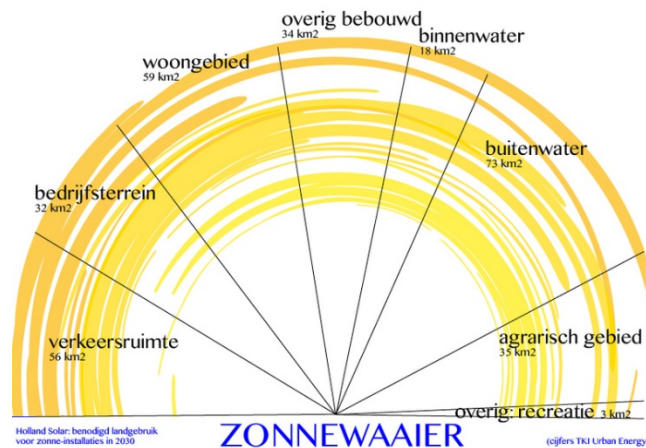


Figure 3. Solar Fan (Zonnewaaier) from Holland Solar

### *Spatial Planning Act – Environmental Act (2021)*

A recent revision of the Article 2.4 of the Crisis and Recovery Act (overheid.nl, article 2.4, 2018) includes the possibility, as an experiment, of deviating from the designated laws and regulations for innovative projects. For a solar park this means designing a zoning plan with a broadened scope. If the project contributes to innovative developments and it is sufficiently plausible that their implementation contributes to combating the economic crisis and to sustainability. This revision can be seen as an anticipation towards the Spatial planning act, due in 2021. This experimental revision grants the opportunity to change the zoning plan from 10 to 20 years, which was the case in the standard Crisis and Recovery Act. This benefits a valuable economic business case for solar parks. The revision of the law does not mention public participation as a separate condition.

### *Green Deal Participation of the Environment at Sustainable Energy Projects*

This guideline is constructed and signed by several governmental parties, the municipality and regional associations and several renewable energy technology organisations. The goal is to share knowledge and exchange experience to enhance participation processes regarding sustainable energy projects in physical and social living environment (Greendeal Participatie van de Omgeving bij Duurzame Energieprojecten, 2018). They will do this according on the basis of the following questions:

- What possibilities are there to set-up a transparent participation process that connects to and supports decision-making processes?
- How can added value be created for those involved and for the physical environment?
- How can local initiatives be formed, positioned and professionalized?

This guideline provides several leads to public participation by describing four stages for the community: informing, thinking along, participating and decision-making. It acknowledges the value of the insights in the interests, wishes and ideas of citizens and societal organisations etc. A balanced approach towards the integration is a key factor that plays an important role in the diminishing of delays in this kind of projects.

*Draft Climate Agreement: 50% local ownership*

In December 2018, a draft Climate Agreement has been delivered by 5 so-called sector tables. The agreement contains a package of measures to reduce the CO<sub>2</sub> emissions with 49% by 2030. One important measure to create public support in sustainable energy projects is the 50% local ownership rule. Underlying this measure is the thought that different stakeholders should work together and divide the risks, benefits and ownership equally. The aim should be a 50% local ownership of the production for the local community (citizens and companies). These kind of investments do imply a form of entrepreneurship by citizens which includes carrying the risks. This 50% aim might be deviated from when local or project specific reasons allow for this. At the moment of publication of this report, the draft climate agreement is being discussed in the house of representatives. Whether the 50% local ownership will make the final draft (expected in May 2019) remains to be seen.

**3.2 Types of initiators**

Solar park projects can be categorized on the basis of the type of initiator. The location of the project is also determined by the initiators. According to RVO (2016), initiators can be categorized in four types:

*Individual initiators*

Initiators who would like to implement a solar installation to increase the sustainability of their (location-bound) home, business or institution. The following characteristics apply:

- Limited size
- In accordance with consumption
- Generated energy is partially directly consumed.

*Energy cooperatives*

These are non-profit organisations who would like to develop solar energy locally (i.e. neighbourhood, town or city) and collectively with citizens and businesses.

- Cooperative / collective with (local) citizens and companies.
- Financing through crowdfunding and financial participation.
- All generated energy is delivered to the grid.

*Commercial project developers*

Initiators for whom the development and operation of a solar park is detached from the environment.

- Commercial and professional project development.
- Often, there are several locations simultaneously in development and the working area is throughout the Netherlands as a whole.
- All generated energy is delivered to the grid.
- Not all project developers have the intention to operate the solar park themselves; often, the purpose is to sell the park after it is constructed.

*Municipalities*

In their role as permit issuers, municipalities can give space to initiatives or reject permit applications. However, municipalities can also be initiators themselves by appointing solar park locations in solar plans, visions and policy, and subsequently by recruiting developing parties.



### 3.3 Inventory of Dutch solar parks

#### Cases

The website [zonopkaart.nl](http://zonopkaart.nl) provides an overview of realised and planned solar parks of all sizes in the Netherlands up and including 2017 (see figure 4). The map is based on applications of the SDE+ subsidy from the Rijksdienst voor Ondernemend Nederland (RVO). The RVO website has the latest update with the realised solar parks in 2018 (see figure 5) (RVO, 2019)

In this study, we searched for online information for every realised land based solar park to gain insights on social support, acceptance and participation. We therefore only included solar parks where information was available online (i.e. articles, newspapers, weblogs, etc.) and for which some information on support or participation was available. Furthermore we made a categorisation based on their size: small ( $\leq 3\text{MWp}$ ), medium ( $>3\text{MWp} \leq 20\text{MWp}$ ) and large ( $>20\text{MWp}$ ).

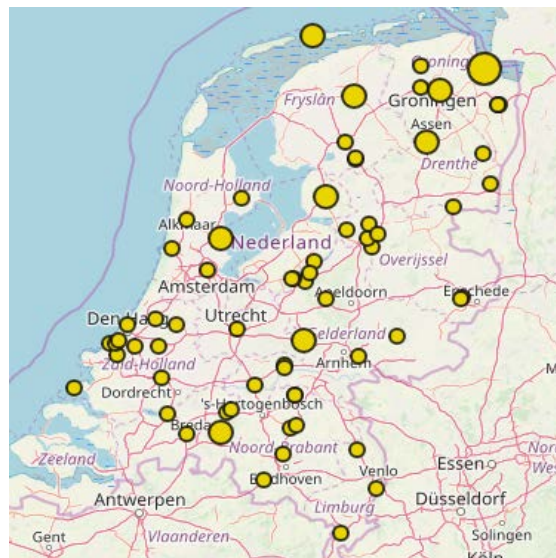


Figure 4. Overview of realised solar parks in the Netherlands until 2018 (zonopkaart.nl, 2018)



Figure 5 Overview of realised solar parks in the Netherlands in 2018 (RVO, 2019)

### *Small ( $\leq 3\text{MW}$ )*

#### Vierverlaten solar park, Municipality of Groningen

The local energy cooperative 'Grunneger Power' initiated the Vierverlaten solar park (2,1 MWp) together with the Municipality of Groningen and ENGIE. This solar park is one of the largest in the Netherlands that is owned by citizens and businesses (van Akkeren, 2018). Here, citizens are able to buy solar panels and would receive an annual fee for their generated electricity. More than 350 citizens bought solar panels. Through crowdfunding, investors provided a loan to the local energy cooperative to invest in solar panels. The proceeds of the investment are guaranteed and therefore independent of the solar yield and the electricity price (van Eme, 2018). In 2018, the municipality of Groningen is responsible for the energy management, including the generation of renewable energy. However, the intention is that with Grunneger Power, the solar panels are transferred to the residents of Groningen within 5 years. This means that the pre-funded amount will return and can be invested in new sustainable initiatives (revolving fund). In addition, the solar park site is sown with herbs and flowers and in addition to all solar panels, there will be sheep and bees. The sheep will mow the grass and the bees will produce honey. Sustainable energy is therefore not the only asset that the Vierverlaten solar park will produce (ENGIE Services, 2016).

#### Tweede Exloërmond solar park, Municipality of Borger-Odoorn

This solar park (1,3 MWp) was the first one located in Drenthe and it is constructed in the land of a farmer, who had the plan for years, however arranging permits and subsidies proved to be more difficult than expected (Stegen, 2015). The farmer had no complaints over the solar park and nothing is seen from the public road. There is also no annoyance from glare. Additionally, sheep and pigs are freed to graze the grounds, and because there is space between the solar panels, grass will still grow (Albers, 2016; GroenLeven, 2016).

#### IJsselmuiden, Municipality of Kampen

For the IJsselmuiden solar park (2,71 MWp), the project developer submitted the permit application, but due to delays from the municipality to provide permission, the subsidy expired. Moreover, there is an issue between horticulturists and the municipality. The horticulturists believe that the land must be available for the expansion or construction of greenhouses, while the mayor sees it as a way to generate more sustainable energy and as a productive use of inactive land (Selles, 2018).

#### Hengelo, Municipality of Hengelo

This is the largest solar park in Twente, with a land size of 34 hectares football pitches (1 MWp). The solar park is located close to the site of waste processor Twence, which is has become a producer of green energy (RTV Oost, 2018).

#### Heeten, Municipality of Raalte

The energy cooperative Edona received subsidy for the realization of a solar park in Heeten of about 2MWp. The energy cooperative carried out extensive studies into the optimal handling, shape, location, technical layout and landscaping of the solar park, within the existing frameworks and pre-conditions. The solar park consist of an area of 4.5 ha, of which 3 ha will be covered with the solar panels and the rest used for landscaping. The solar park area has been excavated and with the

released ground, an earthen wall will be made with a green hedge and fence. As a result, the solar panels are virtually hidden from view. The energy cooperative is continuously creating support for the solar park. They for instance interviewed residents and local stakeholders (including framers) on their objections and wishes regarding the solar park (Tertium, 2015). Local residents and businesses can invest in the solar park, hence producing their 'own' sustainable electricity and making a contribution to the sustainability of the village.

#### *Medium (>3MW ≤20MW)*

##### Harculo, Municipality of Zwolle

In Harculo, local residents opposed the plans for a 15 ha solar park (15 MWp), as the solar panels would not fit the green landscape. Residents' concerns are the visual impact and reflection of the sun. However, a local resident mentions that it is better than wind as they do not make noise. For others, there appears to be no problem but they do not like it when it is built right next to their house as they prefer to look at nature. Some residents think that it could have been worse as the space could have been used to build an office building (Stegenga, 2018).

##### Woldjerspoor, Municipality of Groningen

The solar park is located in the former Woldjerspoor waste disposal site in Groningen and it is the largest solar park on a former landfill site in the Netherlands (12 MWp). The location has received an important function in the transition to sustainable energy and in addition, the solar park supplies electricity to a hydrogen station (GroenLeven, 2017a). The solar park was an initiative of Afvalbeheer Regio Centraal Groningen (ARCG), the province of Groningen and GroenLeven.

##### Emmeloord, Municipality of Noordoostpolder

The solar park of 14 hectares is the largest in Flevoland (12,5 MWp). The Municipality of Noordoostpolder is very satisfied as it makes an important contribution to their ambition to be energy-neutral by 2030. The aim is to allow companies in the area to benefit from it (GroenLeven, 2017b).

##### Ameland, Municipality of Ameland

This solar park (6 MWp) was an initiative from the municipality of Ameland, the Amelander Energy Cooperative (AEC) and Eneco, as a step towards an energy-neutral Ameland in 2020. They received a lot of support among the people in Ameland. The energy cooperative provided social support and all communication around the project to be as transparent as possible, showing every step in the process openly and honestly. At the beginning, there was a fear that the park would have negative consequences for tourism on the island. However, they decided to build the solar park at the Ballum airport so no nature area was at risk of decay and they also built an earthen wall around it. The AEC offered Amelanders and owners of recreational homes to participate in the solar park via a bond loan, which resulted in many interested people (HIER opgewekt, 2016).

#### *Large (>20MW)*

##### Delfzijl, Municipality of Delfzijl

This solar park in Delfzijl, Groningen (30 Mw), consists of 30 hectares (RTV Noord, 2017).

### *Solar park cases on the participation ladder*

The participation ladder of Arnstein (1969), described in paragraph 1.5, provides a way to classify public participation energy projects on an eight rung scale. The level of detail of the eight steps of this ladder did not match the online information we could gather. However, we could find information on the three levels of *nonparticipation*, *degrees of tokenism* and *degrees of citizen power* that summarize these eight rungs.

Regarding the distribution of costs and benefits, we could find information for most described cases. Moreover, all reviewed cases show at least a level of tokenism where citizens are informed and heard by decisionmakers. When citizens are unsatisfied and resist the plans, the challenge at this level is to change the status quo and enhance their right to decide. For example, when there are no complaints at first glance, this might hint at minor resistance and citizens being heard. But when at the same time there is no mention of any citizens being involved in the decision-making, complaints can come up later in the process.

The example of Hengelo solar park falls under the tokenism category. Citizens expressed their concerns and they were heard. The solar park was built in the end. In Ameland citizens were given the opportunity to financially participate in the solar park and there was transparent communication on every step of the project. But the citizens were not granted with decision-making power.

Citizen power is expressed at the Vierverlaten solar park, where citizens together with the surrounding companies own the solar park, putting them in the decision making seat. The solar park in Heeten also displays a certain degree of citizen power where the citizens in the energy cooperative were able to decide to leave space for alternative landscaping.

## 4 Results from expert interviews

The energy justice framework used for the literature review shows that there is no uniform approach to study solar park cases on public support. Moreover, as mentioned before, energy justice on solar parks is a topic that is currently gaining momentum and there is not yet much information available, in particular for the Netherlands. Therefore, to be able to achieve a deeper understanding of the current state of solar parks in the Netherlands, ten expert interviews were carried out with selected stakeholders from different organisations (more details over the interview protocol and interviewees are described in paragraph 1.4.3, and Annex II and Annex III).

This chapter captures the results from the ten expert interviews based on the analysis of the interview data. All data is gathered by interpretively transcribing the interviews. Section 4.1 consists of insights on energy justice from the interview results divided into distributional and procedural justice. Section 4.2 provides insights from the experts on Dutch policy on a municipal, provincial and national level. Then, section 4.3 covers the insights regarding the different types of initiators. Lastly, section 4.4 looks at the lessons that solar park projects can take from wind park projects and section 4.5 gives insights on solar park examples provided by the interviewees.

### 4.1 Insights on energy justice

The answers from the interview questions were ordered in comments that are linked to distributional and procedural justice. The two tenets are divided in categories, with sub-categories if necessary, to further clarify a subject that was mentioned often by the interviewees. Since the questions were constructed around the energy justice tenets and other research questions, most of the answers' specific questions could be fitted within the intended categories. However, some parts of the answers showed more similarity with another category.

#### ***Distributional justice***

##### *Costs and benefits*

Participants mentioned various costs and benefits from solar parks. These are summarized in Table 2. As for the costs, most interviewees mentioned the aesthetical change of the environment as a cost for local residents. Several interviewees had the opinion that impact on ecology was a cost for the environment. Furthermore, several comments were made about opportunities to improve the ecology with solar parks. This was mostly mentioned in combination with enhancement of the surrounding flora and fauna or the replacement of industry, agricultural land or wasteland. Financial benefits for the land owner and the residents are associated with benefits by several participants (see sub-section on insights over financial participation). Another benefit that was often mentioned is the possibility to combine solar parks with other ways of land use such as other renewable technologies e.g. wind energy.

Table 2. Aggregated insights on costs and benefits from the expert interviews. Note: Costs and benefits stated in the table are specifically for solar parks. Other costs and benefits in comparison to wind energy are included in section 4.4

Costs	Benefits
Aesthetics: visual impact on landscape (i.e. industrial view instead of nature)	Job generation: encourage local employment in construction and maintenance of the solar park.
Ecological impact: <ul style="list-style-type: none"> <li>- Crops underneath solar panels grow less well due to shadow.</li> <li>- Solar panels may eventually have a negative effect on the crop retention of water and nutrients.</li> <li>- Soil degradation</li> </ul>	Ecological solar parks and multiple land-use, for example: <ul style="list-style-type: none"> <li>- Installation of insect hotels</li> <li>- Growing crops</li> <li>- Monitoring of birds</li> <li>- Raise the groundwater level</li> <li>- Solar park as an improvement of the ground quality in comparison to agricultural purposes</li> </ul>
Competition with food production: less agricultural land available	Electricity generation close to consumption
High grid connection costs	Financial participation
Space deprivation due to large space required	Contribution to the sustainable energy transition and sustainability goals
	Productive use of unused land (e.g. edge of highways)
	Stimulation of a local fund to finance sustainability loans
	Temporary land-use
	No noise pollution
	Energy independency
	Ownership (e.g. production resource for landowners or farmers)
	Improved landscape view over an industry terrain (horizon view as solar panels are low)
	Aesthetics can be adapted based on preference (e.g. solar panels colours)
	Possible combination with already existing wind parks
	Solar parks are a mean towards independence on a geopolitical level from oil and gas producing countries

#### *Distribution of costs and benefits*

Regarding the distribution of the costs and benefits, several interviewees stated that the landowner has more advantages than the local residents. But this is also the case with other projects such as the construction of buildings or greenhouses. The landowners are taking the risk and the project developers must also make a profit. Thanks to the SDE+ subsidy, landowners and project developers can make a profit. But this subsidy has been decreasing, which leads to less financial support for participation possibilities. According to several interviewees, in wind energy on land,

the business case margins are usually more positive, which leaves more space for investments in public participation. The branch association mentions that sometimes in the eyes of the local residents, the project developers enrich themselves at the expense of the aesthetics of the environment.

An interviewee from a provincial government stated that there used to be few adverse effects for solar parks. However, as space becomes increasingly scarce, more disadvantages are emerging. The relationship between advantages and disadvantages is becoming increasingly difficult to balance due to the lack of necessary knowledge, resources and control. The interviewee from the national government mentions that there is insufficient knowledge about the ecological effects. Also, the provincial government emphasizes that more research is needed into what type of agricultural land can be utilized for solar parks, and the same goes for ecological sites. For instance, some provincial governments are evaluating their solar park guidelines to see how they can include the community. In 2018, no Environmental Impact Assessment (EIA) is required for solar parks. Nevertheless, the interviewed consultancy firm emphasizes that these kind requirements may be imposed on projects, but we must be careful that these requirements do not lead to less solar park projects being realized. This might be in conflict with the goals for the energy transition to fight climate change.

#### *Financial participation*

According to the interviewees participation in general and also financial participation is a potentially strong engine for the energy transition, when it comes to public support and acceptance. However, this differed greatly from area to area, where (expected) demographic shrinkage areas require less participation. In these areas there is fewer employment and there is a more aging population according to the interviewees from the national government.

Financial participation represents one of the building blocks for solar park projects, as public support and involvement prescribe that local residents benefit from the project. This enhances public engagement according to the provincial government. Nevertheless, financial participation must fit within the business model and this is becoming more difficult now. According to the branch association, there is less subsidy available from the SDE+ scheme. The citizen association ODE decentralized initiated the requirement to give local citizens and companies at least 50% ownership over the production of sustainable energy. Some stakeholders consider this unacceptable as the local environment would benefit without bearing the risks. Within the municipalities of the pilot in the province of Brabant, the financial participation model is based on a percentage of the park where the local environment can become owner. The interviewee from the national government states that this is 25%, applied by all participating municipalities.

In 2018, the discussions in policy refer to 20% or even 50% participation by local residents, especially in larger projects such as 50 MWp-scale. However this is very difficult with investment costs of 50 or 60 million euros. Collecting such amounts from local residents in the municipality is often not realistic. Local funds and cooperation with energy cooperatives are also options and these should also be discussed with municipalities. The refurbishment of a community centre is sometimes preferable to direct financial compensation. For example, in the North of the Netherlands, employment is important and rural integration is less of a priority,

but this differs per region. That is why customization must be provided and local policy must be drawn up. There is, however, a difference between a solar farm and greenhouse horticulture or a transport building, since there is no need for financial participation here. There is also a difference between fossil fuels and renewable energy. The land profit is higher when sustainable energy is placed above ground and landowners can earn more with this energy source than with natural gas. This is due to a small drilling well for natural gas compared to the acres needed for renewable energy projects. For a project developer, achieving the required percentage of financial participation is a bigger challenge because a loan must be requested from the bank before you know how much your investment is going to be. This may depend on how many local residents participate. One of the interviewed commercial project developers has worked on a bond system that can be applied to solar parks. This requires cooperation with experienced parties because these kinds of systems are difficult to construct. There is no standard, each municipality has its own requirements and understanding of support. The interviewee from the national government states that the margin and thus the profit sharing for participants is smaller for solar than for wind.

Furthermore, the NGO we interviewed has incorporated the ambition to acquire 50% local ownership from the draft Climate Agreement. The project developer must then do his utmost to realize this and then consult with the municipality about whether this is also feasible. When this is included in the municipalities' policy, it is up to the initiators to take this into account. The landowner shares the project with a local cooperative, but this ownership involves investing, so also bearing the risks. An example of this is the municipality of Voorst, where the local cooperative will participate as soon as there is an agreement from the municipal council.

One of the commercial project developers gives local residents the opportunity to participate financially in the project. For this, they make 25% of the project available, this is often used by renewable energy cooperatives. It takes place at the start of the project and not at a later stage where the investment risks are present. This means that investments are made for offering this opportunity and 25% of this is taken into account. It can go up to 50%, although this has been an exemption. The financial participation opportunities that are offered fit the business case. The commercial project developer argues that it is important that the project is supported locally and that neighbourhood associations and other local initiatives carry a substantial part of the 25%. Otherwise there is the risk that a national cooperative invests and this does not contribute to the local support.

The interviewee from the consultancy firm argues that in some smaller agricultural communities it is difficult to create a large percentage of local property. The municipal boundaries are often the maximum that is considered local. The 50% local property rule as stated in the draft Climate Agreement does not always have to be the key to more support. It is also possible to see if resources from a project are used in a balanced way. What does local ownership mean and does this automatically imply development risks for the co-investing party? Another way of sharing profit may be a better solution. There is an unequal division when one party bears the investment risks and after the construction other stakeholders can share in the benefits.



The provincial government sees that financial participation differs per solar park case and elements such as financing capacity and certain risks can limit the possibilities for financial participation. In addition, not everyone is always happy with the end result. At present, local residents can invest in solar park projects, however it is still too early to draw conclusions on which financial participation methods work best and what results the different methods yield. Usually, solar park projects that are developed by energy cooperatives have a positive influence on financial participation. In that case a local resident buys a solar panel that is installed elsewhere. It is difficult however to finance the solar park locally. A good way to accelerate the process is through crowdfunding, but crowdfunding is constructed at a national scale, whereas the local residents are the ones who should participate.

### ***Procedural justice***

#### *Information disclosure*

##### *Procedure*

Most of the time, a solar park project starts with an initiator approaching a landowner. This land can be owned by the municipality, but a local agricultural entrepreneur as a landowner is the most common case in the Netherlands. For most initiators the information disclosure procedure starts, just like for other building projects, with a regular spatial planning procedure where the municipality has to approve a permit. This procedure includes publishing the project plans and informing the local environment. The interviewees state that at this point in time it is wise for the initiator to involve the local residents and neighbouring farms in order to create support for the project. It varies per solar park who takes care of the information provision. Some municipalities are pro-active in approaching stakeholders whilst others adopt a wait-and-see attitude, and they let the initiator of the project take care of it. Other municipalities involve a consultancy firm or require the initiator to come with a plan, as they also take into account the effect on the objectives of the municipality.

##### *Providing information*

According to the branch organisation, a traditional information evening may not always be suitable, as it mainly involves only sending information. This will only provide feedback from a general story, which is difficult to process in the development of the project. The project developers state that they are responsible for listening to the concerns of local residents, acknowledging their needs and come up with alternatives within the borders of the business case, while the interviewee from a research institute stresses that it is important to find the story behind the resistance. This involves recognizing the point of view from the residents, that is often location specific. The discrepancy occurs when decision makers look at a project from a general point of view, trying to cooperate in something that has worked in previous projects. Residents look at more issues, like the historical frame and their attachment to a place.

In the interviews an example was given, where five municipalities are constructing a coordinated policy for the region. A consultancy firm presented two maps of the area with options for wind and solar energy, and with possible challenges. They first presented these maps to the civil servants of the municipalities. In the next step the plans will be presented at three evenings at three different locations, not

municipality specific, where local residents will be present and are asked where they see possibilities for sustainable energy landscapes, including solar parks. During these evenings, questions and suggestions will be gathered, after which the plans are adjusted and presented again at to the community. On the basis of this last meeting, policy can be drawn up that can be sent back to the municipal councils.

One interviewee mentions that from the experience with wind energy, a condition has been developed whereby everyone within a radius of 1.5 km is invited to an information evening. Here the location itself is discussed, two or three alternative configurations for a fit the project in the environment, and different possibilities for participation. This information evening is a starting point for the exchange of information with individual local residents. Sometimes this results in taking separate pictures from the resident's house to clarify to what extent their view is influenced. A Q&A session is held during information evenings and a website is created for each solar park. The local residents have no influence in the amount of acres or location of the solar park, but there is room for adjustments in the configuration and sometimes on the amount of solar panels. This may be done with natural integration such as biodiversity or increasing the distance between the solar panels. These kinds of decisions are made in collaboration with a landscape architect who plays a vital role in the license provision from the municipality.

#### *Framing*

For the disclosure of information, it is also important how the message is framed and conveyed. According to the interviewee from the national government, participation is sometimes a way to influence the spatial planning task. This might be avoided by letting the initiator approach the project as an economical environmental task that can be met by analysing what sustainable energy solution would fit best in a specific area. If he communicates this as a stimulation of the local environment in a responsive way, resistance might be diminished. Also try to connect to local developments, so that multiple goals can be realized for the community.

Sustainable energy projects in demographic shrinking areas, for example, should initiate a positive movement, keeping money locally by balancing the right costs and benefits, training local people and providing jobs on the project. This can have a positive effect locally, however it differs per location due to the level of education, number of available jobs, etc. Here the energy transition can enhance the development of a municipality or region.

The municipality project leader states that there are area funds where revenues from the energy parks go to local associations or charities. In this way, the benefits are not limited to the individuals that are able to invest, but are spread through the region. Funds can be used for the local football club, the church / mosque or nature development. It is important that people see that the project has a positive effect on their surroundings. Another advice is to connect to the perception of the residents by asking them questions on how they experience this change in their environment. They first want to be heard before the initiator talks about the trade-offs.

### *Objectivity, adequacy and timing*

How local residents are informed about the installation plan of a solar park differs per project and project developer. Some project developers may only approach the local residents once the proposal is approved by the municipality / province. Several interviewees stressed that the timing of informing the local residents is a real challenge for initiators of a solar park. In terms of timing, local residents should be informed before application procedure for an environmental permit is started. When the permit process is started, the details of the park are almost entirely known, diminishing room for participation. Although this permit process obligates the project developer to inform the public and publish information, several interviewees mention that this should not be the first contact with local residents. However, the quality and degree of development of the project plays a crucial role in the moment of approaching to local residents. Therefore project developers find this very difficult, as there is no perfect timing in involving the local residents. It is acknowledged that there is a thin line between involving local residents before having concrete plans or at a later stage, but there seems to be a trend where the point of contact is brought to the beginning of the process.

The interviewee from the consultancy firm advocates for a mapping of the environment and first contacting the municipality. If there are no objections, then contacting local residents is the next step. This is still far before applying for the permit. The project developer is in the lead with the communication process, the consultant can also assist in this. It is important that there is single point of contact for the project from the development side, preferably the project developer himself. Yet other interviewees suggest to first approach the local residents and present the municipality with a plan that is supported by the majority of residents.

### *Participation paradox*

One interviewee highlights the importance of having a balance because on one hand, projects that are not sufficiently worked out might not be taken seriously and on the other hand, highly detailed projects might cause local residents to feel less involved. This is also referred to as the *participation paradox*, which entails that when you inform local residents too quickly with a simple set-up, they are unable to make an informed judgement. If this is done later in the process when the plan is more elaborated, residents might feel left out because everything is already defined and there is a perceived lack of involvement.

### *Discrepancies between decision makers and residents*

According to the interviewee from a research institute, the core of the problem is the distribution of the costs and benefits. This is currently unbalanced. The decision makers often communicate this challenge from a procedural side, whether the procedures, permits and the law are addressed. The citizens take little interest in this point of view, focussing on recognition. It is important that they are recognized for their share in the burdens. This is where history, identity issues, city versus country play a role. Compensation is an example of the discrepancy that occurs between the communication of decision makers with local residents. When residents are not acknowledged in their position and sentiment regarding their environment, something like a financial compensation can be perceived as a bribe. This is location specific, and what works in a particular province or region does not necessarily work in the others.

### *Mobilising local knowledge*

Some provincial governments oversee how the local residents are involved, which local experts were consulted and what knowledge they had to offer. If local residents are looking for specific expertise, the municipality or province can put them in contact with the right expert. For instance, agricultural nature protection and meadow bird associations can provide valuable knowledge about the area according to several project developers. The interviewee from the consultancy firm mentions that local knowledge is still too limited and local residents with specific knowledge, like a local ecologist, could become more involved in projects that apply to the direct environment.

According to the interviewee from the provincial government, the way in which project developers approach local residents differs per local area and the municipalities have an important role to play in advising the project developer. Involving the landowner with its local knowledge of the social structure and the natural environment in the conversation with local residents might be beneficial. The local residents are, strictly speaking, the people whose land borders the park. But to avoid exclusion, a project developer mentioned that the initiator should investigate the topographic map and use the local knowledge of the landowner in the selection of people who will be affected. In a next step the landowner is asked to personally approach the residents on a short notice with the announcement that there are plans for a park and that they will receive an invitation letter from the project developer for an information evening. A relatively new trend are the tenders by landowners (municipalities, agricultural entrepreneurs), in which they construct a list of demands declaring for the participating project developers to meet. These are generally also the landowners who pay more attention to public support and participation. For example, they can also mobilize supporters to reach the broad public.

## **4.2 Insights on Dutch policy**

### ***Municipality level***

In practice, some municipalities have specific expertise, while others require more advice from the province. Some municipalities use the policy from the province as guideline for constructing local policy. An advice from the consultancy firm to the municipality is to lay down a policy outline for solar parks with certain matters open for discussion. For example, the preferred area can be specified but the preferred features and areas can be under discussion. Also, the way the project is set up, such as communication with the local residents and the building requirements can be described in policy, but there should be room for creativity in the market.

The NGO interviewee builds on this, where they advise to first formulate a local policy/vision and then develop a policy. Many municipalities with areas fit for solar parks have no policy, and when they do, it often lacks the conditions under which solar parks can be developed. This argument finds support from the branch organisation, where a higher efficiency and steeper learning curve can be reached amongst municipalities that form policy. A policy can also be seen as a form of protection for local government officials, where a deliberate policy can be used against commercial project developers that might be looking for a quick win at the expense of the local environment.

Local policy can be made more efficient when municipalities would take over policy aspects that work at other municipalities. These kind of policies can enhance the members of the council in taking a stand in favour of the sustainable energy projects by emphasizing on its necessity. This can be used as a counter argument against commercial project developers who take advantage of a municipality for the quick win.

One interviewee states that policies can ensure that authorities (i.e. municipalities, provinces) will communicate more with the market. However, the policy preconditions are not always checked on technical or financial feasibility in the market. Hereby local stakeholders have been involved in the policy making but project developers or other stakeholders from the market are not involved. This is a missed opportunity since they have to bring the policy in practice.

The project leader for the municipality project gives the example of five municipalities that are in the process of constructing an equal policy on energy landscapes, including solar parks. This way it is possible to create a level playing field and prevent the project developers from going into different municipalities to see where the lowest standards are to develop a solar park. A sense of justice can be achieved by, for example, equate the standards for a local fund.

### ***Province level***

The interviewee from IPO mentioned that no agreements have yet been made in the field of solar parks because the Climate Agreement process is currently taking place. There will be a 'technology neutral agreement' for the generation of renewable energy as part of the Climate Agreement. Until now solar parks are no exception to other projects for which spatial planning policy applies. For all these projects, an Environment and Planning Act will be introduced in which participation is becoming increasingly important. All provinces are busy writing an environment and planning vision, or have already completed that process, to meet this act. The interviewees from the provincial government and NGO stated that the provinces of Flevoland and Overijssel have specific policies that the municipalities can use, whereas Gelderland lacks specific provincial policy for solar parks. For provinces that do not have this, the discussion is different for every municipality.

According to one of the project developers, there is an increasing need for guidelines and it cannot be long before solar parks will get its own code of conduct. The branch organisation believes that the amount of resistance against solar parks without such a code will delay the energy transition substantially. The northern provinces have drawn up their own manifest. This is a nice initiative, where involvement of local residents by initiators plays an important role. The environmental federations are also involved here in search for a combination between ecology and sustainable energy. The manifest can be signed by initiators like project developers. Furthermore, project developers are also actively approached by environmental federations to make use of their knowledge in fitting solar parks.

It would be beneficial when the province would add more clear guidelines in their frameworks for solar parks. However, this is difficult as the municipality is the

competent authority when it comes to solar parks. It is also possible that a municipality has no public participation included in its policy, thus having a negative impact. The interviewee from consultancy firm emphasizes that a large provincial area where a strict framework is used has a small chance for succeeding for a lack of room for local input.

#### *RES (regional energy strategies)*

In 2019, the regional energy strategies will be established. Here, ambitions on sustainable energy are defined per region which, according to one of the interviewees, might make it easier for project developers as they can connect the projects to these ambitions. What often happens, is that a project developer approaches a municipality that does not yet have a policy for solar parks, which slows down the process.

The RES does put extra pressure on the municipalities, who are usually understaffed, as there are often only one or two officials responsible for the sustainable energy portfolio. Furthermore, it is often seen that there are very ambitious regions that come up with a nice roadmap, such as in North Limburg. This may not be put in to practice by municipalities, who instead make their own policy.

#### **National level**

##### *SDE+*

The branch organisation mentioned that the SDE+ will stop in 2025 and it is expected that the industry continues without subsidies. This can only be realized with the expected continuation of the price drop for solar panels or the increase of electricity prices, or both effects together. An option would be to replace the subsidies with tenders by that time so the government remains in control.

##### *Solar ladder (Zonneladder)*

One of the commercial project developers states that the solar ladder is not a good idea. It would not work in practice to favour solar energy on roofs because these kind of projects with multiple roof owners take longer. About 30% of the roofs are technically suitable. The next step on solar ladder after roofs is the area neighbouring the living environment. Since many people live here, these kind of projects usually meet an above-average amount of resistance. Hence, a project in the middle of an outer area has the preference of this commercial project developer.

According to the interviewee of a NGO, the solar ladder seems more of a tool since you need both roof and ground-based solar panels. There is also no official solar ladder, but a motion to make the solar ladder official policy has been adopted by the House of Representatives. They will see if and how to incorporate this in national policy. The NGO uses part of the solar ladder and expresses the need for more national conformity. Another example is the preference within the solar ladder to combine ground mounted solar parks with other landscape features; this is very dependent on the local situation and landscape.

##### *Green Deal participation*

The national government interviewees mentioned the Green Deal participation where, amongst others, examples are developed of how to achieve public

participation, such as thinking about where the solar park can be placed, issuing shares, etc. Four stages are defined: informing, contributing ideas, participating, and deciding. The contributing ideas stage and the participating stage will probably become more extensive. The deciding stage will be harder to reach for residents. In the Green Deal, a whole range of opportunities for participation are given, which should ultimately be included in the first draft of the Environment and Planning act. The Green Deal takes into account spatial integration, cost efficiency and participation.

#### *50% local ownership*

The proposal of 50% local ownership from the draft Climate Agreement is met with scepticism by most of the interviewees. One of the commercial project developers mentioned that it is possible and part of their policy to make the community for at least 25% and sometimes even 50% owner of the solar park. The other initiator interviewee states that in practice these kinds of percentages are very hard to reach, especially in small municipalities with a low financial reach. They perceive the target of 50% local ownership under the current circumstances as too ambitious. The branch association underlines this where most of their members perceive this as unrealistic, especially when the community does not carry the risks attached to the investment.

#### *Centralized vs decentralized policy*

Currently, according to the national government interviewee all municipalities are reinventing the wheel separately. A large amount of information on how to incorporate public participation is similar and could be arranged centrally. However, in Drenthe for instance, people are not in favour of a top-down approach. Provinces and municipalities can manage it more decentral when the central government has the preconditions in order such as financing, network connection and knowledge hubs. The knowledge hub can also be established by research institutes like PBL and ECN part of TNO. An important feature are the fees (or costs for the permits to build a solar park) that differ between municipalities. Some municipalities use the low costs to attract initiators offering discount on fees. These costs should be the same to avoid an unfair competition according to interviewees from the national government.

The branch association mentions that with a decentralized policy, there are too many variations in requirements per project and per municipality. This increases the uncertainty for the initiators and goes in the expense of standardization and quality of projects. For initiators this implies a lot of customization per project that increases the costs. On the other hand, a more decentralized approach gives citizens and the market more influence over the policies. With a more centralized policy, it is possible to realize more continuity in the projects with lower risks, cost reduction and public support as outcomes.

According to the research institute, research is being done on the Social Impact Assessment (SIA) for ways to secure public participation. Improvements can be made to enhance the institutionalization, however this can lead to resistance on how to implement this. The EIA policy reflects this, where resistance towards this policy centred around the absence of certain environmental aspects. Another example is the Crisis and Recovery law that has been interpreted as a mean to force the municipality into changes in their spatial policies. Any form of

institutionalization can contribute to an improvement of democracy and to greater sustainability, but their seems to be a limit to progressive reaction towards this. The spatial planning act could be a more progressive response to the crisis and recovery law.

### 4.3 Stakeholders

Based on the descriptions in the interviews, an actor map was constructed to view the most important connections between the stakeholders (see figure 5). This overview is not extensive: all of the stakeholders are eventually dependent on and connected to each other. The map emphasizes the direct connections between stakeholders, that interviewees mentioned. Except for the grid operator, all stakeholders were interviewed and thus are represented in the research. We did not interview a grid operator since the distance between their role and the public seemed to be somewhat distant. We did not include the public as a stakeholder, but they are of course an important party.



Figure 5. Stakeholder actor map based on the interviews conducted in this report

### 4.4 Insights on types of initiators

During the expert interviews, emphasis was also given to the difference in public support between parks with different types of initiators. Certainly there is a difference in public support and participation when different parties initiate the solar park. For instance, the interviewee from the provincial government stated that an energy cooperative as initiator involves the local residents early in the process. This creates more public support and positively affects the duration of the process. Therefore, their solar park projects are smaller in size and contain a longer process



time. Solar parks that are initiated by local energy cooperatives are more successful because they automatically take the social effect into account. The consultancy firm interviewee adds to this that the financial incentive is also less strong when the energy cooperative is the initiator. All the surplus earned with the project can be used to fit the solar park as well as possible in the area.

Municipalities often leave the public involvement to the energy cooperatives, and they work together with project developers. In practice, large-scale solar parks have less public support. The energy cooperative is usually too small to take the time and money to initiate a large-scale project. These large scale projects tend to have less support from local residents, who are unsatisfied with the commercial developers. The NGO mentions that there is no energy cooperative in the province of Gelderland that has managed to realize a large land-based solar park (>20MW). In general cooperatives have more support but this support is location dependent. A solar park on a wasteland does create more support in comparison to an agricultural area with high food production.

It is often said that support from energy cooperatives is better (sub-region de Kempen). However, it can sometimes be the case that the support is mainly reinforced by people who were already interested or have a neutral stand toward sustainable energy initiatives. The question is whether the silent minority will also become more enthusiastic when it is set up by an energy cooperative compared to a commercial project developer. The interviewee from the national government states that it is also important to look at the composition of the energy cooperative. The question is whether the residents whose property borders the solar park participate and you have to be aware of the fact that not all residents are able to participate.

Furthermore, the interviewee from the NGO states that both the municipalities and project developers are not always trusted by the local residents. The interviewee from the national government acknowledges this by stating that it matters from which party the message is conveyed. The national government is not always considered neutral, where the project developer is often seen as a party that benefits financially. A local person from a cooperative is then essential for credibility.

The branch association gives the example of the landfill site in Lochem where resistance has arisen against a commercial developer and the example of a local initiative that has received no resistance. The difference here was the local sentiment towards the intended place. As an initiator, it is important to understand the current situation and the historical context. The best way to do this is when municipalities select certain areas in consultation with the citizens, hereby making way for project developers who do not have to go in that level of detail. A project developer argues in the same direction with the example of Hogeveen. Here the municipality has drawn up a clear policy whereby the project developer can clearly follow certain steps. The consultancy firm does however warn project developers that a certain level of background knowledge on the community and environment is required.

The core challenge, stated by a project developer, is that a landowner takes the initiative and the project developer designs it in such a way that the solar park

actually fits there. The interviewee from the provincial government gives Flevoland as an example, where in almost all cases the landowner takes the initiative together with the project developer and goes to the municipality. This works well with the support from the municipalities. The grid operator also plays an important role in this, and the project developer must approach this party to see if a project can be realized. There are project developers who select areas with a smart geographical information system (GIS) program. In the example of Sluis, the landowner contacted the municipality and the local residents so that the project was locally embedded.

The national government interviewee proposes the option to not just let a project developer advocate for a solar park, but to have multiple options available for the community to choose from. This is difficult, because then a project developer has to deal with the local process which might not be ideal. A combination with guidance from the municipality is then a better option.

#### **4.5 Lessons from wind energy parks**

Many of the interviewees expressed that prior to their activities in the solar energy sector, they gained experience in the wind energy sector. Most interviewees have described the wind energy sector as a full grown market that has learned from most of its lessons, whereas the large scale land based solar park projects have just started to occur. As the interviewee from the consultancy firm puts it, the land based solar park market is where the wind energy market was 10-15 years ago. Even so, its spatial impact cannot be underestimated. Many of the lessons described below are built on first hand practices. In contrast to wind energy where the provincial government is the leading authority, the municipality fulfils this role for solar energy parks.

A statement from the national government indicates that some municipalities do this by stating that to achieve their sustainable energy goals they first introduce a wind park to the environment. If this is met with strong resistance, they propose a solar park as an alternative with less potential resistance. Since wind and solar parks are obvious technologies in the foreseeable future to reach the provincial and local sustainable energy goals, they often compete in the spatial domain and within policies of municipalities and provinces. Both have a considerable impact on the landscape and one of the solutions put forward by the interviewees is combining the two technologies in one spatial task. One of the commercial project developer employees explains that they inform people living in a certain distance of a project. They have taken this distance from their wind park projects and use it with the solar park projects. In addition, the timing in combining the two forms of sustainable energy in a landscape is delicate since the community might feel overwhelmed. An advice from a commercial project developer is to start the talks on a solar park when the wind park license is obtained. Some policies and code of conducts combine these two technologies in one document.

The interviewee from the sector organisation explains that wind energy parks have learned the hard way to give the community a saying in the design of the project within the possibilities of the business case. Furthermore, wind parks have a code of conduct (NWEA, 2016) that supports initiators in how to construct a wind park with public support. The solar sector organisation is drafting such a code with the

input from professionals. The importance of a similar code of conduct is emphasized by several other interviewees.

The enhanced level of participation in wind parks can be a valuable lesson for proceedings of solar parks according to the provincial government interviewee. The interviewee from the NGO stresses that keeping the conversation going with the community and treating them 'as your own neighbours' might lead to a strong connection even when it comes to the biggest local opponents. A more practical lesson that several interviewees mention are the adjustments needed in the grid for these large energy parks. This remains a spatial challenge for the energy landscapes in general.

The interviewee from the NGO describes that wind parks have experience with the 50% local ownership rule, where the initiator should make the community co-owner for at least 50%. Several interviewees have stressed that it has proven to be very difficult to reach this percentage for initiators. One of the reasons provided is the lower profit margin in solar parks compared to wind parks. The consultancy firm says that they have to explain to the municipalities that due to these financial restraints not all the environmental demands of the municipalities can be met.

#### **4.6 Examples of solar parks**

Most interviewees were able to back up their story with examples of solar parks where stakeholders were incorporated in the process. The interviewee from the provincial government described the solar park in the Finsterwolde municipality with a history of social differences between landowners and their employees. One of these landowners did his best to gain public support, but the municipality was very passive. This gave a very small group of citizens the opportunity to create resistance against the planned solar park. The landowner did not have a good relationship with this small group to start with. It can be seen as an example of where the historical and cultural context played an important role. The municipality plays an important role and might have had more influence by emphasizing their sustainable energy goals to their citizens.

The municipality of Hoozeveer has a clear policy on constructing a solar park. From the project developer's point of view, this provides clear guidelines that can be followed. It helps to explain why a type of sustainable technology is chosen for a specific area. The community asks for this and a clear policy helps the municipality to explain it. The local government is best positioned to explain the local context.

In one of the solar parks at Voorst, an NGO was asked to play a role in diminishing the resistance of the community. The policy makers of the municipality had a focus on solar energy and a reserved attitude towards wind energy. But with the absence of a clear policy and vision, this particular solar park was rejected by the local council. The question is whether this council will accept the solar park with the additional adjustments made in the project plan, or that they first demand an established local policy. An interesting development in this example is that wind energy has made its way to the negotiations in the meantime. To create a level playing field, several municipalities might work together in constructing a policy for a certain region. The policy project developer gave an example where one of the reasons to put this in motion is to prevent commercial project developers playing

the municipalities out against each other. This can create a level of injustice, with different possibilities at every municipality. One of the examples of municipalities working together is an local fund to strengthen the community; this can be the same percentage at every municipality that is part of this policy.

## 5 Conclusions

*Which factors are determinants for the public acceptance of solar park projects in the Netherlands?*

The balanced allocation of benefits and costs is crucial for renewable energy projects such as land based solar parks. In the literature and interview results, the main benefits from solar parks include job generation, ownership, lower energy prices, sustainability and energy security. While the main costs that may, to some extent, influence the acceptance of solar parks, are the aesthetic impact, land use, electricity costs and ecological impact. Compared to wind energy, in general, there is less effect on the environment with solar parks in comparison, less noise pollution and less aesthetic impact. However, the space requirement is higher.

When providing information, the timing of information is very important and seems context and place dependent. There is no consensus on when to provide information and the participation paradox shows the complexity of the matter. But in general the moment of involving the community by an initiator has substantially been brought forward since the first large wind park and land based solar parks first appeared.

In the Netherlands, new financial participation models are appearing, however it is difficult to construct these systems because there is no financial participation policy at the moment. Local policies, e.g., requiring up to 50% local participation are challenging to realize and can represent a burden for project developers. Nevertheless, local ownership brings engagement and increases public support.

*How are local residents involved in the development of solar parks in the Netherlands?*

This involvement depends on the type of initiator. Local residents are sometimes the initiator of a solar park when they are part of an energy cooperative. Their level of involvement often depends on the level of professionalization of the cooperative. These initiators aim for the highest degree of community engagement.

The agricultural entrepreneur as one of the most common landowners, has an interesting position as an initiator. He or she is usually a local resident, embedded in the municipality where the involvement of the community can be determined by the relationship of the landowner with the local environment.

Most commercial project developers carry-out information evenings where they listen to concerns from local residents, acknowledge their needs and propose alternatives within the margins of the business case. The involvement of citizens differs per project and project developer, and in the possibilities they offer on financial participation like local funds and obligations, configuration options and ecological add-ons. A shift towards a more community centralized design seems to be at hand. In practice, most involved parties are aware of the policy changes at hand where participation will be one of the requirements. Although some good examples can be found in this report, neither existing literature nor interviewing Dutch experts make it possible to give a more definitive advice on the most vital

determinant, or optimal way of participation when it comes to solar parks as of yet. The findings of this report imply that the recognition of residents through early consultation and integration provides better standardized and 'communitized' policies. This clears the way for more fairly perceived processes of sustainable energy parks and a more just perceived distribution of local costs and benefits. The necessity of proven viable business cases where local benefits are monetized is pertinent, if important stakeholders such as project developers should take this approach.

*How does the current policy and context in the Netherlands have an impact on participation by local residents in the development of solar parks?*

The current state of the Dutch policy on land based solar parks is decentralised. Partly driven by the resistance against large scale wind parks, it was decided to shift the authority from a provincial governmental level for wind parks to a local government level for solar parks by granting the municipalities and their local councils the competent authority. Unfortunately, the current status amongst many municipalities is an absence of policy on land based solar parks. In several cases this had led to delay of projects thus frustrating sustainable energy targets. This research focuses on national guidelines and policy instruments and to what extent they include public participation and support.

With the absence of national policy guidance, practitioners found ways to provide guidelines on how to incorporate public support. One of the drivers is the draft Climate Agreement, that describes public participation as an important requirement, resulting in measures like the 50% local ownership rule. Another driver is the Spatial Planning act, due in 2021. This act makes public support mandatory for projects like land based solar parks. However, it explicitly does not provide clear guidelines on how to enhance participation. The act does provide a guideline containing examples of projects with participation means. In practice, a lot of projects take participation into account and work in line with this future act.

The land based solar park sector is becoming more professionalised, but it is still less developed compared to the wind energy sector. In practice these sectors are often compared, especially when it comes to handling public resistance. The wind energy sector has a code of conduct that contains guidelines on how to improve public support, something that can be beneficial for land based solar parks as well. The rapid changes in the last few years in the solar park sector has evoked political reactions with the solar ladder motion in the house of representatives and policy changes like the amendment in the Crisis and Recovery law. The only guiding national policy document so far is the SDE+ subsidy, which does not include any requirements for public support or local ownership for solar parks. Several stakeholders have suggested an investigation of the ability to include public participation in a solar park project plan as a requirement in the application of the SDE+. On the other hand, since the municipalities are the competent authority, the question remains whether a national policy such as the SDE+ should directly interfere in this process by influencing local participation. The proposed national Code of Conduct for solar parks can be a less strict alternative.

Currently, most municipalities are working separately on their policies, which is considered positive as citizens have more influence. However, it brings many variations in requirements per project and municipality with increasing uncertainty and costs for project developers as a result. Therefore, there needs to be a balance between centralized and decentralized policies, with room for cross-learning opportunities between municipalities, provinces and regions. Especially stakeholders concerned with implementing these policies opt for a more centralized policy that can bring more continuity scaling-up possibilities in the projects.

## 6 Discussion

### 6.1 Limitations of the energy justice framework

The literature review on solar parks cases is relatively limited, especially in connection to energy justice. There is a relatively small body of research of land based solar parks (Carlisle et al., 2016; Mundaca et al., 2018; Roddis et al., 2018; Sareen & Haarstad, 2018; Chiabrando et al., 2009; Miller, 2012). This forced this research to include some sources regarding solar energy in general. Furthermore, the study of Dolter & Boucher (2018) that conducted workshops to investigate guidelines for solar energy projects, thus creating a hypothetical situation. The current research recognizes the differences between solar energy programs and specific land based projects. Furthermore, hypothetical workshops might provoke different sentiments than real life projects do.

These limitations can be attributed to very recent deployment of large-scale solar parks and the novelty of the topic of energy justice. There is more literature on wind farms available. However due to the limited scope and time, this literature was not extensively explored in this study. Furthermore, we found no uniform or standardized approach to study solar park cases thoroughly on public participation and acceptance. In this study, we used the energy justice framework as a holistic approach to achieve a deeper understanding of these social factors on solar parks. As mentioned, recognition justice was not included in this framework. Nevertheless, several interviewees mentioned recognition as an important aspect of the sentiment present in communities when it comes changes in their environment.

We chose to use the energy justice in a normative way and acknowledge the limitations of this approach. The energy justice framework is at the heart of the literature review as well as the questionnaire. As researchers we have taken the liberty to place some of the answers to a question based on a certain energy justice component, under a different component. We are aware of our own value connotation in this matter. Even so, we have chosen to assess the energy justice components interpretively and recognize the thin line between some of the categories, especially with the procedural justice tenet.

### 6.2 Case studies

We encountered difficulties on applying the energy justice framework to existing solar park cases in the Netherlands due to lack of information available. Most information on Dutch solar park cases was gathered from the media (e.g. online newspapers, blogs) which lacked objectivity or inclusive overviews in most cases. Also for the literature review, no solar park case provides detailed information on all the components of energy justice. An extensive case study in the Netherlands on the frame of energy justice would be recommended. In addition, a national platform is recommended to document more detailed information and data on solar park cases from each Province. The zonopkaart.nl website provides a good overview of realized and in progress solar parks in the Netherlands, but this source has not been able to keep up with the rapid development of projects in the Netherlands. Our research demonstrates the unique challenges for land based solar parks compared



to roof based systems and proposes a source that provides detailed up to date information on social factors.

This research has used the Arnstein (1969) participation ladder as an indicator of public participation. Due to the limited scope and time and the little information available for Dutch cases, the focus was more on a broader interpretation of the ladder than to provide each case with a classification. Furthermore, this research is aware of the bias that some of the non-scientific media sources might have. One of the interesting findings is that a level of decision-making power granted to citizens is hardly ever reached within solar park projects. They are sometimes allowed to decide on the distance of the panels or some features within the parks, but they cannot decide on the location of the park or whether there should be a solar park at all. This would imply that the highest level of the Arnstein (1969) ladder is not reached in any of the observed cases.

### 6.3 Stakeholder interviews

We decided to limit the number of interviews and did not include a grid-operator. But at the beginning of 2019 the importance of the local and national grid operator showed. Several areas in the North-East part of the Netherlands are not able to connect more land based solar energy parks to the grid due to the risk over overcapacity. This technical issue is caused by the relatively low population density in these areas and a traditionally smaller grid capacity.

We portrayed the different types of initiators separately, but in practice most examples were carried by a combination of these initiators. A commercial project developer always needs to consult a landowner, whether this is an agricultural entrepreneur or a governmental body. An agricultural entrepreneur often needs a commercial project developer to construct a viable business case and when a municipality initiates a solar park they connect with an commercial project developer or an energy cooperative. All these processes and collaborations lead to different levels of public acceptance, since all these parties have a level goodwill and trust within the community.

One of the reoccurring themes in the interviews was the discussion on the terminology. Terms like public support (Dutch: *draagvlak*) and acceptance (Dutch: *acceptatie*) were often debated by interviewees, stating that these terms were not commonly used practice. Some of the suggestions that were made: level of participation (Dutch: *participatiegraad*) or process participation (Dutch: *procesparticipatie*). This terminology allows for a measurement of the amount of citizens involved and an evaluation of their participation. Participation seems to have a preference over public support, since it implies the active involvement of the environment instead of only supporting a certain course of events. Another term is 'added value' for the environment. This also applies to citizens that are actively engaged in the process. Furthermore, acceptability instead of acceptance is proposed. The important difference is that the act of acceptance might include a form of resignation while acceptability can be part of the quality of a project.

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## 8 Appendix I - Energy justice framework

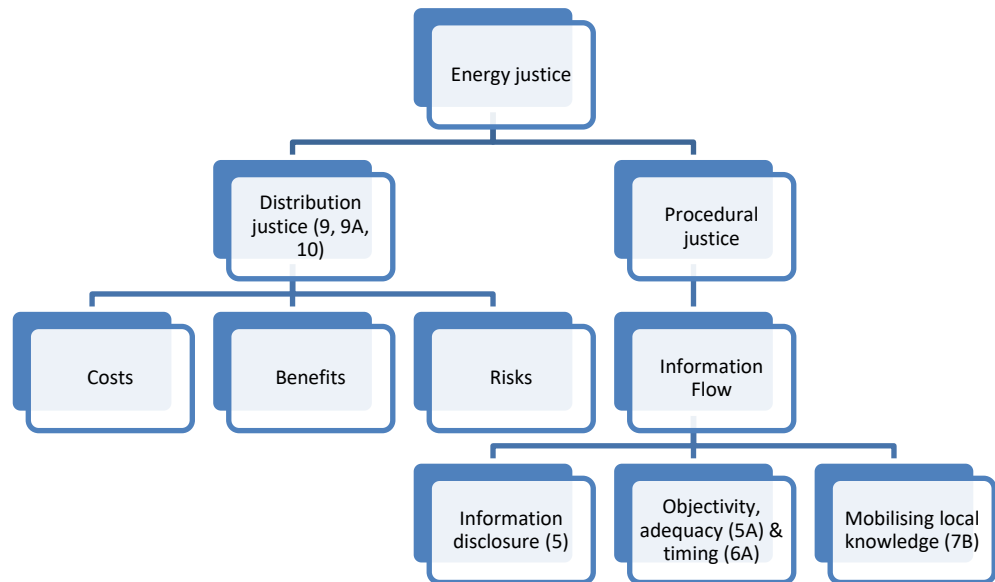


Figure 5. Energy justice framework. Interview question numbers linked to the components between brackets

To be able to link the interviews to the energy justice framework, a questionnaire of 14 questions was constructed (see Annex II). The interview consisted of some introductory questions, followed by questions linked to features of procedural justice focused on the component information flow and distribution justice, focused on the cost and benefits (see Figure 5). The answers to these question were used to answer the research questions 1.3.1 and 1.3.2.

We asked what policies were familiar, what advantages and disadvantages this policy contained and whether these policies would contribute to public participation. The answers to these questions provided information to answer research question 1.3.3. Since different parties can initiate a solar park, we asked the interviewees whether they think that these different initiators have a different level support by the public. This could be linked to research sub question 1.3.3.1. The last interview question was connected to sub research question 1.3.3.2, and asked to interviewees to compare the more mature sector of wind parks with the solar park sector. Some questions contained sub questions to further explore the subject or to cover an aspect of the framework.

## 9 Annex II – Interview protocol

### Opzet interview



**Scope:** Bij projectontwikkelaar meer vragen over specifiek zonnepark. Bij beleidsmaker/overheid de vragen over het framework (zie comments vragen Voorbeeld zonnepark) meer in algemene zin, dus op nationaal niveau stellen)

### **Introductie**

Hallo, mijn naam is .... Ik werk bij de afdeling Energietransitie Studies van ECN/TNO. Zoals gezegd doen wij onderzoek naar zonneparken en naar hoe omwonenden bij dit type projecten betrokken worden. Het doel van ons onderzoek is om een overzicht te krijgen van de status van zonneparken in Nederland en het draagvlak vanuit omwonenden. We zijn bezig met 10 interviews met verschillende experts. Deze interviews werken we uit en daar maken we een verslag van.

Heeft u de informatie email gelezen?

Opsturen verslag en commentaar geven. Toestemming opname.

De opzet van het interview: introducerende vragen, draagvlak zonneparken, beleid

Het interview duurt maximaal 1 uur.

### *Vragen*

1. Op welke manier bent u betrokken bij zonneparken op land?

### **Draagvlak**

Hoe komt u in uw huidige functie in aanraking met draagvlak van omwonenden voor zonneparken?

A. In hoeverre wordt dit vanuit uw organisatie ondersteund?

2. In hoeverre speelt het draagvlak van omwonenden een rol bij het realiseren van een zonnepark? [evt. doorvragen naar een positief en een negatief voorbeeld]

A. Wat waren de succesfactoren bij het positieve voorbeeld?

B. Wat waren de valkuilen bij negatieve voorbeeld?

3. Denkt u dat het voor het draagvlak uitmaakt welke partij heeft het zonnepark initieert? Licht toe. (indelen in één van de vier categorieën: gemeente, coöperatie, lokale initiatiefnemer zoals boer of een commerciële partij/projectontwikkelaar)
4. Op welke manier worden omwonenden in het algemeen geïnformeerd over de zonneparken?
  - A. Welke overwegingen zijn er gemaakt bij welke informatie er aan de burgers werd verstrekt?
5. In welk stadium worden de bewoners bij het project betrokken?
  - A. Welke overwegingen zijn gemaakt bij het besluit over op welk moment de burgers in het proces betrokken werden?
6. Welke partijen worden er betrokken bij de informatievoorziening richting te omwoners?
  - A. Waar wordt deze keuze op gebaseerd?
  - B. In welke mate wordt de kennis van de omgeving/lokale experts hierin meegenomen?
7. Welke invloed heeft draagvlak (van burgers) op de ontwikkeling van het zonnepark (positief en negatief)?
8. Welke voor- en nadelen levert een zonnepark volgens u op? (niet alleen financieel, denk aan fonds, lokale voorzieningen (investering in sportclub/dorps huis, laadstation, investering lokale economie, inzet braakliggend terrein, maatschappelijk samenhang, bewustwording), zelfvoorzienend)
  - A. Wat vindt u van de verdeling van de voor- en nadelen van het zonnepark tussen de verschillende belanghebbenden? Waar wordt deze keuze op gebaseerd?
9. Wat is uw mening over financiële participatie van gemeenten en omwonenden bij een zonnepark? Kent u een voorbeeld van een project waarbij omwonenden financieel participeren?

### **Beleid**

10. Welke wetgeving/beleidsvoering heeft betrekking op het creëren van draagvlak bij zonneparken?

11. Welke voor- en nadelen kunt u noemen van dit beleid? *(welke voor en nadelen zou wet- en regelgeving kunnen hebben?)*

A. Denkt u dat het creëren van draagvlak efficiënter of minder efficiënt verloopt met wet- en regelgeving?

12. In hoeverre draagt het huidige beleid bij aan het betrekken van omwonenden bij de ontwikkeling van zonneparken? Op welke manier? Zou dit beter kunnen/moeten?

13. Wat zijn volgens u de belangrijkste ontwikkelingen op het gebied van zonneparken in Nederland?

A. Wat zou er volgens u moeten veranderen?

B. Welke lessen kunnen de zonnepark projecten van andere technologieën leren?

Afsluiting:

- Bedanken voor interview
- Rapport beschikbaar
- Weet u nog iemand die wij voor ons onderzoek zeker zouden moeten spreken? Bespreken welke kandidaten we nog nodig hebben.



## 10 Appendix III - Stakeholder interviews

Table 1. Overview of stakeholders and interview date

	Stakeholder	Number of interviews	Date of interview
1	Branch association	1	30-10-2018
2	Provincial government	1	31-10-2018
3	IPO	1	02-11-2018
4	Commercial project developer	2	05-11-2018 20-11-2018
5	National government	1	05-11-2018
6	NGO	1	13-11-2018
7	Consultancy	1	30-11-2018
8	Research institute	1	06-12-2018
9	Policy project developer (municipality)	1	07-12-2018

These 10 interviews were divided amongst 9 stakeholder categories. Three of the interviews were held with two people connected to the same organisation. All of these interviewees were directly involved in the process of land-based solar parks. The approach of semi-structured interviews provided the opportunity for more extensive explanation or clarification on an interviewees' view. The duration of the interview was approximately an hour. Eight of the interviews were done through videoconferencing and two interviews were done face to face.