

RENEWABLE ENERGY INSTALLATIONS AS COLLATERAL FOR COMMUNITY ENERGY PROJECTS

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Synopsis: Energy communities develop mostly small-scale renewable energy projects, frequently on the land or roofs of other people. In financing these projects, the energy communities need inexpensive legal means to retain ownership of the renewable energy installation and to create a real security right in the installation for their lender. Relying upon solar panels on roofs of other people as a case study, this contribution comparatively examines the legal obstacles and costs involved for energy communities to achieve these goals in Germany, Italy, the Netherlands, and South Africa. This contribution shows that Dutch and Italian law generally bind the building and the solar panels together under the doctrine of accession. These legal systems require the creation of a right of superficies, which gives rise to costs for a legal professional, the civil-law notary, but tends to lower the interest rate for the community's loan. By contrast, German law will allow the energy community to deactivate the accession of solar panels by agreement, leading to lower costs for legal professionals but also potentially higher interest rates. South African law remains in a state of flux. This contribution argues that while small-scale energy projects will generally be at an economic disadvantage vis-à-vis large-scale projects, the route towards lower transaction costs for energy communities is not straightforward because it depends on the individual case whether lower costs for legal professionals will outweigh higher interest rates.

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I. INTRODUCTION

To decarbonize our economies and societies, we need an enormous amount of renewable energy. Communities of citizens that together produce renewable energy can facilitate and make a substantial contribution to this energy transition. Unlike the current system of energy supply with large-scale power plants that burn fossil fuels, such energy communities can support a decentralized and local transition because biomass energy generators, solar panels, and wind turbines can be installed at a smaller scale in many different places.[1] By participating in such small-scale energy projects, these communities make additional private capital available, increase the local acceptance of renewable energy projects, such as solar roofs and windfarms, and support local community building and economic development.[2] As energy poverty rages in both the Global North and the Global South, such communities are expected to provide more affordable energy to vulnerable citizens.[3]

Stressing their importance to the energy transition, the European Union (EU) recently recognized "citizen energy communities" under the Internal Electricity Market Directive (2019/944) and "renewable energy communities under" the Renewable Energy Directive (2018/2001). In South Africa, there is no such legislation, but recently there have been announcements of a significant expansion of

1. Stephanie Lenhart et al., *Comparing and Contrasting the Institutional Relationships, Regulatory Frameworks, and Energy System Governance of European and U.S. Electric Cooperatives*, *in* ROUTLEDGE HANDBOOK OF ENERGY DEMOCRACY 34, 34-35 (Andrea M. Feldpausch-Parker et al. eds., 2021).

2. *See, e.g.*, Anne-Lorène Vernay et al., *Energy community business models and their impact on the energy transition: Lessons learnt from France*, ENERGY POL'Y, Feb. 28, 2023, at 1-2; Valeria Jana Schwanitz et al., *Statistical evidence for the contribution of citizen-led initiatives and projects to the energy transition in Europe*, SCI. REPS., Mar. 2, 2023, at 7; Fleur Goedkoop & Patrick Devine-Wright, *Partnership or placation? The role of trust and justice in the shared ownership of renewable energy projects*, 17 ENERGY RES. & SOC. SCI. 135, 135-137 (2016).

3. *See generally* Romaric Duvignau et al., *Benefits of small-size communities for continuous cost-optimization in peer-to-peer energy sharing*, APPLIED ENERGY, Aug. 5, 2021.

renewable energy generation.[4] Already in 2023, the Department for Human Settlement announced a new policy change that all new subsidized housing will be provided with solar panels.[5] Also, there is the CHOICES project for community-driven electrification,[6] and at the provincial level, there are renewable energy independent power producers procurement and generation investment programmes.[7]

The EU Directives on energy communities compel Member States to remove unjustified obstacles to their flourishing.[8] When it comes to unjustified obstacles in the legal realm, the focus is often on restrictions and gaps in public energy regulation, such as the absence of the right for communities to share energy.[9] This contribution discusses a distinct issue: how private law obstructs the flourishing of energy communities. As all operators of small-scale energy projects, energy communities have a natural economic disadvantage compared to large-scale energy plants. They generally display lower returns and higher costs per generated energy unit because the overhead and transaction costs they incur are distributed over a lower amount of generated energy.[10]

In addition to this economic disadvantage, the small-scale nature of these energy projects may give rise to a distinctly private-law disadvantage. Energy communities often make use of land that does not belong to the community as a whole, especially for wind turbines on farmland and solar energy (PV) projects on farmland or roofs. In civil-law jurisdictions and those whose property law has been inspired by them, the so-called doctrine of accession may dictate that the owner of the land also owns the renewable energy installation.[11] This requires the energy community to incur additional transaction costs for notarial deeds or other legal

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4. Thabo Maeko, *Minister pursues renewable energy*, BUS. DAY 2 (July 9, 2024), https://bd.pressreader.com/article/281586655811507.

5. Even prior to this national policy, municipalities were providing free solar systems to some indigent households, with around 113,200 such households on record in 2019. *See* Blessings Masuku, *Rethinking South Africa's household energy poverty through the lens of off-grid energy transition*, 41 DEV. S. AFR. 467, 475-76 (2024). This follows from earlier national policies to provide solar water heaters in informal housing settlements. *See generally* Peta Wolpe & Yachika Reddy, *Urban energy poverty. South Africa's policy response to the challenge*, *in* ENERGY POVERTY AND VULNERABILITY: A GLOBAL PERSPECTIVE (Neil Simcock et al. eds., 2018).

6. *See generally CHOICES: Community Energy in South Africa*, INT'L INST. FOR ENV'T & DEV., https://www.iied.org/choices-community-energy-south-africa (last visited Feb. 10, 2025).

7. *See Independent Power Producer Procurement Programme*, MINERAL RES. & ENERGY REPUBLIC OF S. AFR, https://www.ipp-projects.co.za/Home/About (last visited Feb. 3, 2025); *Embedded Generation Investment Programme (EGIP)*, DBSA, https://www.dbsa.org/projects/embedded-generation-investment-programme-egip (last visited Feb. 3, 2025).

8. Directive 2019/944, of the European Parliament and of the Council of 5 June 2019 on Common Rules for the Internal Market for Electricity and Amending Directive 2012/27/EU, art. 16, art. 59 para. 1(z), 2019 O.J. (L 158) 125, 151-152, 182; Directive 2018/2001, of the European Parliament and of the Council of 11 December 2018 on the Promotion of the Use of Energy from Renewable Sources, art. 22, 2018 O.J. (L 328) 28, 121-122.

9. *See, e.g.*, Joshua Roberts, *Power to the people? Implications of the Clean Energy Package for the role of community ownership in Europe's energy transition*, 29 RECIEL 232 (2020); Enrico Giarmanà, *Managing Renewable Electricity within Collective Self-Consumption Schemes: A Systematic Private Law Approach*, RENEWABLE & SUSTAINABLE ENERGY REV., Oct. 16, 2023, at 4-5.

10. Jens Lowitzsch & Florian Hauke, *Renewable Energy Cooperatives*, *in* ENERGY TRANSITION, FINANCING CONSUMER CO-OWNERSHIP IN RENEWABLES 150 (Jens Lowitzsch ed., 1st ed. 2019).

11. SJEF VAN ERP & BRAM AKKERMANS, CASES, MATERIALS AND TEXT ON PROPERTY LAW 618-659 (2012); Hendrik Ploeger et al., *Circular economy and real estate: the legal (im)possibilities of operational lease*, 37 FACILITIES 653, 654 (2019).

documents to ensure the energy community retains control of the renewable energy installation and can use it as collateral for loans. This is particularly important in the case of the landowner's bankruptcy. In the worst-case scenario, the energy community would have no guarantee of controlling the renewable energy installation and/or not be able to use it as collateral, rendering the project financially and practically infeasible. Put together, these disadvantages increase the already high transaction costs of the energy communities. Large-scale energy projects, by contrast, do not suffer from the same disadvantages. They are more likely to be located on the land of the operator, can distribute higher transaction costs over more energy units, or the operator is more likely to be able to provide other forms of security.

Private property law currently imposes the unity of the ownership of the land and of objects directly or indirectly attached to it, but the energy transition in practice requires a fragmentation of these rights. This contribution comparatively examines Dutch, German, Italian, and South African law to determine where the energy community would lose ownership of the renewable energy installation when it is directly or through a building attached to another person's land, using solar panels on roofs as a case study. An examination of property rights in solar panels is particularly urgent because the ratio of transaction costs and the value of PV projects is generally higher than with other renewable energy installation. Moreover, there are different types of solar panels — (1) integrated into the façade/roof or (2) not integrated — that may be subject to different regimes. The chosen jurisdictions all foresee the doctrine of accession but choose different avenues — with Dutch law being the strictest, South African and Italian law offering a viable way out, and German law providing for an exception to accession. The comparison also has great practical value as in all these jurisdictions the energy transition is underway or at least urgently needed. In all of them, but in particular in South Africa, small-scale energy projects would be a tool to alleviate energy poverty.[12]

In jurisdictions where the renewable energy installation would belong to the landowner, this article then investigates whether and, if so, how and at what cost the energy community could retain control of it and/or use it as collateral. Finally, based on current law and scholarly debates in the examined jurisdictions, it discusses the reasons for relaxing the doctrine of accession in stricter jurisdictions to lower the transaction costs involved in the energy transition. Overall, this contribution provides a legal toolbox for ensuring the fragmentation of rights[13] that small-scale renewable energy projects need.

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12. *Cf. GOAL OF THE MONTH – Goal 7: Affordable and Clean Energy*, U.N. SUSTAINABLE DEV. GOALS (Jan. 2025), https://www.un.org/sustainabledevelopment/goal-of-the-month-goal-7-affordable-and-clean-energy-4/#:~:text=Sustainable%20Development%20Goal%207%20is,%2C%20communications%2C%20business%20and%20agriculture; Directive 2019/944, *supra* note 8, paras. 43, 59-60; Directive 2018/2001, *supra* note 8, para. 67.

13. *Cf.* Björn Hoops, *Property and the energy transition*, *in* A RESEARCH AGENDA FOR PROPERTY LAW 145, 147-48 (Bram Akkermans ed., 2024).

The remainder of this contribution is structured as follows. Section II sketches how community energy projects are financed in practice, with a focus on Germany because it has the greatest community energy sector in the EU and therefore has the most available information.[14] Section III sets out the comparative-law questions answered in this contribution. Section IV addresses the accession of solar panels in the Netherlands. Section V deals with the accession of solar panels under German law. Section VI reviews the rules on the accession of solar panels in Italy. Section VII addresses the accession of solar panels under South African law. Section VIII presents a comparison of the examined rules and a discussion of reform proposals. Section IX concludes this contribution.

II. FINANCING COMMUNITY ENERGY PROJECTS

The German community energy sector is the largest in the EU, and the financing of community energy projects in Germany is fairly well researched. Based on the available literature and empirical research, this section outlines the financing mechanisms for community energy projects to indicate the place of renewable energy installations as collateral.

Citizens who directly participate in the energy community, non-affiliated citizens, local authorities, energy suppliers, and institutional lenders play a major role in financing community energy projects in Germany. Members of the energy community provide funds by purchasing shares in cooperatives, which is the most common legal form among German energy communities[15] or other legal persons.[16] In most cooperatives, members are private citizens, but local authorities and companies may also provide equity through membership.[17] Energy suppliers may become members of a cooperative as well, but cooperatives tend to engage in a limited partnership (*GmbH & Co. KG*) with energy suppliers to protect the cooperative from the financial risks of larger projects and the influence of energy suppliers.[18] Members and partners directly participate in the profits of the energy community through a dividend or another form of disbursement. Many energy

14. *See e.g.*, AURA CARAMIZARU & ANDREAS UIHLEIN, ENERGY COMMUNITIES: AN OVERVIEW OF ENERGY AND SOCIAL INNOVATION 5 (2020).

15. *Bundesgeschäftsstelle Energiegenossenschaften* [*Federal Office of Energy Cooperatives*], DGRV, https://www.dgrv.de/bundesgeschaftsstelle-energiegenossenschaften/#:~:text=Die%20877%20Energiegenossenschaften%20stehen%20mit,die%20breite%20Akzeptanz%20der%20Energiewende (last visited Feb. 13, 2025).

16. Lowitzsch & Hauke, *supra* note 10, at 149; Özgür Yildiz, *Financing renewable energy infrastructures via financial citizen participation - The case of Germany*, 68 RENEWABLE ENERGY 677, 680-681 (2014).

17. Thomas Meister et al., *How municipalities support energy cooperatives: survey results from Germany and Switzerland*, ENERGY SUSTAINABILITY & SOC'Y, Mar. 18, 2020, at 2-3.

18. Rosa Fernandez, *Community Renewable Energy Projects: The Future of the Sustainable Energy Transition?*, 56 INT'L SPECTATOR 87, 96 (2021) (Due to the costs of the wind turbine, such limited partnerships are particularly common in the wind sector).

communities raise money from members and non-members alike through borrowed capital such as bearer bonds, savings certificates, and subordinated loans, which guarantee a percentage of the invested capital as return.[19]

Institutional lenders play a less prominent role here than in other sectors. Energy communities still take out loans, but mostly from cooperative banks and often in the form of subsidized loans.[20] Public authorities, such as municipalities, help create favourable conditions through guarantees and subsidies as well.[21]

To build on this literature, author Hoops has conducted empirical research on, amongst others, the financing of energy community projects.[22] Groups of citizens who together produce renewable energy in Germany were requested to fill in a questionnaire on, among other aspects, their activities, internal organization, and sources of funding. The questionnaire was available online for five months, from April to August 2023, and distributed throughout the networks of several regional associations of cooperatives and national stakeholders. 178 responses were received. After the data was cleaned to eliminate substantially incomplete or otherwise unusable responses, 127 responses were used for the statistical analysis. The descriptive statistics tools and correlation analysis tools of SPSS 28 have been applied to the data.

Respondents indicated the average share of four sources in financing their community energy projects: reserves of the community, capital increases, loans from institutional lenders, and subordinated loans. The responses are as follows.

19. Lars Holstenkamp, *Community Energy in Germany: From Technology Pioneers to Professionalisation under Uncertainty*, *in* RENEWABLE ENERGY COMMUNITIES AND THE LOW CARBON ENERGY TRANSITION IN EUROPE 127 (Frans H.J.M. Coenen & Thomas Hoppe eds., 2021).

20. Stephen Hall et al., *Financing the civic energy sector: How financial institutions affect ownership models in Germany and the United Kingdom*, 12 ENERGY RSCH. & SOC. SCI. 5, 11 (2016); Yildiz, *supra* note 16, at 680-81.

21. Meister et al., *supra* note 17, at 10; Lowitzsch & Hauke, *supra* note 10, at 149.

22. For a comprehensive analysis of the data, *see* Björn Hoops, *Internal Organisation of German Energy Cooperatives: An Analysis of 570 Statutes*, UNIV. OF GRONINGEN (Nov. 9, 2023), https://pure.rug.nl/ws/portalfiles/portal/921213955/Analysis_and_data_statutes_of_German_cooperatives_full_text.pdf.

Table 1: Average Share of a Source of Money in Project Finance (Own Design).

Source of Finance	Average Share in Project Finance (in %)	Standard Deviation (in Percentage Points)
Reserves of the Community	22.65	26.193
Capital Increases	31.66	31.153
Loan from Banks or Other Institutional Lenders	31.29	32.648
Subordinated Loans	14.39	22.689

The average figures show a slight dominance of equity in project finance and a backseat role for institutional lenders. The stark standard deviations indicate disparities among the respondents. Remarkable findings confirm these disparities. 50 out of 127 respondents (39.4%) finance their projects without resort to loans from institutionalized lenders. Seventy-five (59.1%) finance their projects without resort to subordinated loans from members. The type and size of the project and, connected to this factor, the required investment seem to explain these disparities. While the share of bank loans in project finance is substantially and significantly negatively correlated with PV projects,[23] the share of subordinated loans in financing PV projects is significantly higher than with other types of projects.[24] By contrast, the share of bank loans in financing heating[25] or wind[26] projects is significantly higher than with other types of projects. Hydropower projects are less likely to use subordinated loans than other types of projects.[27] The size and price of the heating, hydropower, and wind projects may be behind these correlations. The more renewable energy capacity a respondent has, the less likely it is for the respondent to rely on equity[28] and the more likely they are to rely on loans from institutional lenders.[29]

One of the reasons energy communities and, at least, commercial institutional lenders do little business with each other is the required security. Security rights in shares of a legal person that owns the installations may be ruled out by law or

23. Spearman correlation coefficient -0.482, p=0.99.
24. Spearman correlation coefficient 0.23, p=0.99.
25. Spearman correlation coefficient 0.3, p=0.99.
26. Spearman correlation coefficient 0.206, p=0.99.
27. Spearman correlation coefficient -0.202, p=0.95.
28. Spearman correlation coefficient -0.187, p=0.95.
29. Spearman correlation coefficient 0.28, p=0.99.

lead to additional transaction costs for creating a legal vehicle for this particular purpose.[30] Revenue streams could be assigned to the lender, but only with difficulties. If the energy community acts as an energy supplier or rents out their renewable energy installation to the inhabitants of a building, the revenue may, depending on the contract with the inhabitants, be uncertain due to fluctuating amounts of generated energy and/or energy prices. If the energy community feeds the electricity into the public grid, guaranteed feed-in tariffs, if any, give a little certainty but are increasingly insufficient to cover the loans. By contrast, security rights in land or the renewable energy installations such as a hypothec or a pledge, which are *in-rem* security rights in immovable or, respectively, movable property in civil-law jurisdictions, can play an important role in project finance because they represent enduring value and, if the loan is secured by a hypothec, allow for lower interest rates.[31] From this angle, biomass and hydropower projects are less problematic for project finance because they tend to be carried out on the property of the energy community or at least on the property of one of the members, such as a farmer or municipality.[32] Solar and wind projects are more problematic because they are more often located on the property of a third party because the community does not own a suitable location of a suitable size. It is essential that it should be both possible and inexpensive to create security rights in such projects to help energy communities access the resources of commercial institutional lenders.

III. COMPARATIVE QUESTIONS

For a comparative examination, the discussion of each jurisdiction must answer the same societal questions.[33] The first question is whether the owner of the land automatically becomes the owner of the solar panels once they are attached to the land or roof. Ownership is a term specific to civil-law jurisdictions and those whose property law is inspired by civil law,[34] but this is not problematic as all examined jurisdictions recognize a similar concept of ownership, even if the detailed rules on ownership may differ slightly. Ownership also entails the power to create security rights in the owned object. If the landowner is also owner of the solar panels, the energy community will lose control of them and not be able to

30. *See* Gesetz betreffend die Erwerbs- und Wirtschaftsgenossenschaften [Genossenschaftsgesetz] [GenG] [Cooperative Act] Oct. 16, 2006, BGBL I at 2230, §§ 22, 76, last amended by Gesetz, Oct. 23, 2024, BGBL I at 323, art. 22 (Ger.) https://www.gesetze-im-internet.de/geng/GenG.pdf; Art. 2:34 BW (Neth.); Art. 3:228 BW (Neth.).

31. Under the Basel Accords, banks have to maintain less equity relative to the value of the loan if the loan is secured by a hypothec or other security right in immovable property. This enables banks to charge a lower interest rate.

32. Depending upon the jurisdiction, municipalities and other public bodies own or tend to own plots along rivers. Biomass facilities can be connected with a farming business and have a less significant impact upon the environment than wind turbines.

33. MATHIAS SIEMS, COMPARATIVE LAW 13 (2014).

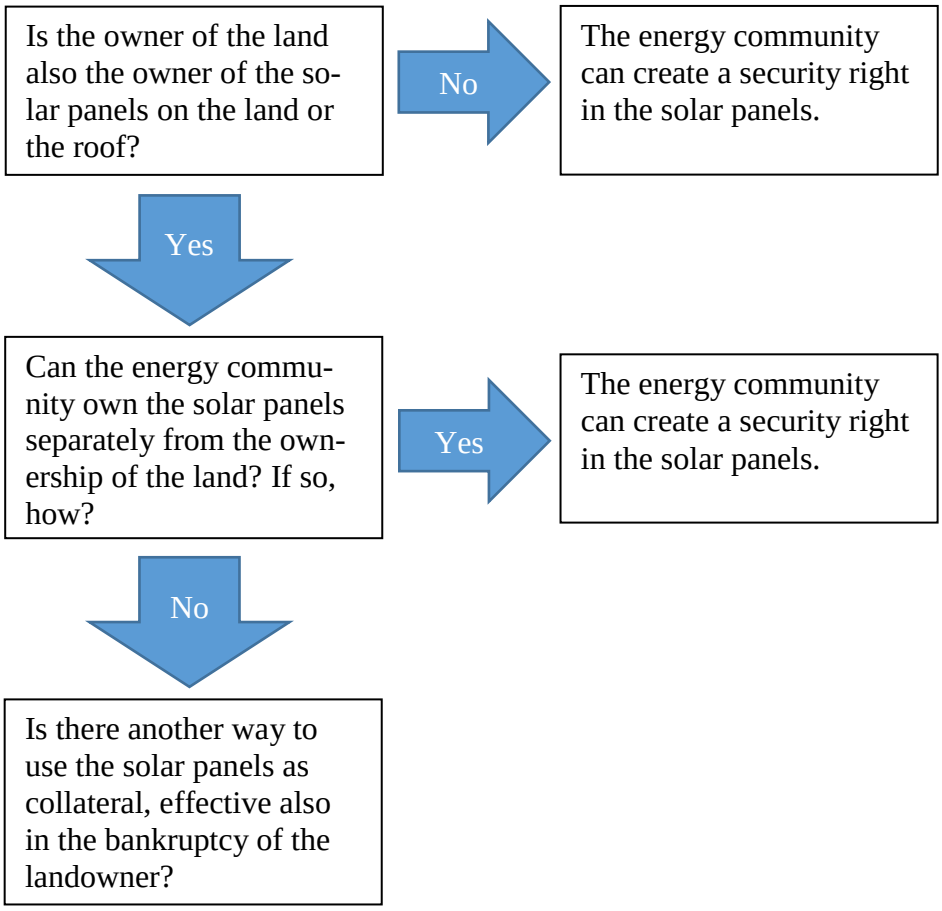
34. VAN ERP & AKKERMANS, *supra* note 11, at 306 (South Africa is a mixed jurisdiction (meaning it has elements of both civil law and common law), but its property law system closely resembles that of a civil law jurisdiction).

create a security right in the solar panels. If the landowner is not owner of the solar panels, the energy community will retain control of them and be able to create a security right.

If the law binds the solar panels and the land together, the community would have to legally separate the ownership of the solar panels from the landownership in order to retain control of the solar panels and be able to create a security right in them.[35] The second question therefore is how, if at all, the energy community can achieve this goal. If there is no such option, the last question is whether there is another legal instrument pertaining to the solar panels that would ensure the community's control of the solar panels and protect their lender's interests in the landowner's bankruptcy.

The following chart summarizes the questions:

Figure 1: The Comparative Questions (Own Design).



35. *Cf.* Ploeger et al., *supra* note 11, at 658-59.

IV. THE NETHERLANDS

The landowner in the Netherlands owns not only the land but also, amongst other objects, the buildings and plants on the land. However, the exact boundaries of landownership remain unclear.

Since the introduction of the new Dutch Civil Code (*Burgerlijk wetboek*; BW) in 1992, a lively debate has ensued about what objects are regarded as forming one unit with the land for the purposes of property law. Dutch courts tend to expand the boundaries of landownership, interpreting the Dutch rules on the components of a thing (*bestanddeelvorming*) and vertical accession (*verticale natrekking*) widely.[36] For instance, in a notorious 1997 judgment, the Dutch Supreme Court (*Hoge Raad*) ruled that an easily removable portacabin that was only connected to the soil through tubes and cables fell under the landownership.[37] Refer to sub-section VIII.A below for a discussion of the goals of these two legal figures.

This expansive interpretation of the rules on accession, which is used here as an overarching term to refer to both legal figures together, poses an obstacle to new business models in the energy transition. This obstacle not only faces energy communities or other entities using land or roofs not owned by themselves but also homeowners who have to take out a loan for the solar panels or for whom it is more affordable to rent instead of owning the solar panels on their roofs. If the landowner automatically becomes owner of the solar panels when the panels are put on the roof, the energy community, the lessor of solar panels, or the lender will lose their security. Further legal steps would be required to ensure that the parties can use the solar panels as collateral and are protected in case the landowner goes bankrupt.

Sub-section IV.A sets out the *status quo* of accession under Dutch law. Where the landowner becomes owner of the solar panels, it may be an option for the energy community to become owner of the solar panels through a right of superficies (*opstalrecht*). Sub-section IV.B examines the extent to which the parties can create a right of superficies with respect to the solar panels. Sub-section IV.C points to some alternatives to the right of superficies that have been developed in legal practice.

A. Accession: The Status Quo

The Dutch rules on accession provide two mechanisms whereby the landowner can also become owner of other objects. The first mechanism is laid down in Art. 3:4 and Art. 5:3 BW, which read as follows in English:[38]

> Art. 3:4 BW
> (1) A component of a thing is anything commonly considered to form part of that thing.
> (2) A thing attached to a principal thing in such a manner that it cannot be separated therefrom without substantial damage to either, is a component of that thing.
> Art. 5:3 BW

36. B. Hoops, *Een rechtseconomisch perspectief op natrekking in de energietransitie en de transitie naar de circulaire economie*, 41 NTBR 298, 300-01 (2020).

37. HR 31 Oktober 1997, ECLI:NL:HR:1997:ZC2478 (Neth.).

38. *Translated in* HANS C.S. WARENDORF ET AL., THE CIVIL CODE OF THE NETHERLANDS (2d ed. 2013).

> To the extent that the law does not provide otherwise, the owner of a thing is owner of all its component parts.

Through this first mechanism, objects attached to a building or another work on the land can become component parts of that building according to Art. 3:4 BW. As the landowner owns that building or work, s/he would own that object as a component part of the building under Art. 5:3 BW because a component part of the building the attached object itself loses its identity and ceases to exist in property law.[39]

Even where the landowner does not become owner through the first mechanism, their landownership may include an object through the second mechanism, vertical accession. Article 5:20(1) lit. e BW and Art. 3:3(1) BW govern this mechanism and read as follows in English:

> Art. 3:3(1) BW:
> The following are immovable: land, unextracted minerals, plants growing on land, buildings, and work durably united with land, either directly or by incorporation with other buildings or works.

> Art. 5:20(1) lit. e BW:
> The ownership of land includes: . . . buildings and works forming a permanent part of the land, either directly or through incorporation with other buildings or works, to the extent that they are not part of an immovable thing of another person.

The second mechanism labels buildings and works that are durably united with the land or with a building or work on the land, as immovable, according to Art. 3:3(1) BW. Under Art. 5:20(1) lit. e BW, the landowner, in principle, owns all immovable things on their land.

In order for the landowner to become owner of the solar panels, only one of the two mechanisms would have to kick in.[40] Solar panels that are integrated into the façade or roof could be component parts of the building under Art. 3:4(2) BW and thus belong to the landowner. Generally speaking, integrated solar panels can only be removed from the roof with substantial damage to either the building or the panels. However, many integrated solar panels in Dutch practice are made from light materials and can be removed easily.[41] The question would then be whether the integrated solar panels are commonly considered to form part of the building. In 1991, the Dutch Supreme Court gave two criteria for assessing whether a machine used for industrial purposes and attached to cables and tubes in a factory formed part of the building.[42] The Supreme Court held that if the factory were considered incomplete and unfit to serve its purpose without the machine, there would be a strong indication that the machine formed part of the factory. Also, if the machine has been tailored to serve or fit in the factory, the machine is very likely to be a component of the factory. Integrated solar panels are

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39. S.E. BARTELS & A.I.M. VAN MIERLO, ASSER 3-IV: ALGEMEEN GOEDERENRECHT 65, 88-93 (17th ed. 2022).

40. S.E. BARTELS & A.A. VAN VELTEN, ASSER 5: EIGENDOM EN BEPERKTE RECHTEN 84 (16th ed. 2017).

41. EMIEL VAN SAMBEEK ET AL., FINANCIERBAARHEID VAN INNOVATIEVE ZON-PV CONCEPTEN (2021).

42. HR 15 November 1991, ECLI:NL:HR:1991:ZC0412, para. 3.7 (Neth.); *see also* HR 28 Juni 1996, ECLI:NL:HR:1996:ZC2116 (Neth.).

very likely to be components of the building under either criterion. As they serve as roof tiles or part of the façade, their removal would leave a hole in the building's roof or façade. A house, to name a practical example, with holes in the roof cannot serve as a home. For this reason, the house would be considered incomplete without the integrated solar panels. Also, integrated solar panels must be tailored to the specific type of roof or façade. All this strongly indicates that integrated solar panels are components of the house. The Amsterdam Court of Appeal came to the same conclusion in 2018.[43] The energy community would thus lose their ownership and face legal obstacles to securing their position.

Non-integrated solar panels, by contrast, are not components.[44] They can be installed on every roof and can be easily removed. Moreover, a building without solar panels is still considered complete as long as it is connected to the electricity grid. Note, however, that this may change should the generation and supply of electricity become totally decentralized. Future public regulations that require solar panels on the roof in order for the owner of a building to meet energy efficiency standards, may also render the building incomplete without solar panels.

While non-integrated solar panels are not components, vertical accession appears likely to deprive the energy community of their ownership. The applicable requirement is that solar panels are durably united with the land under Art. 5:20(1) lit. e BW. There is no doubt that solar panels are indirectly connected to the land through the building.[45] With respect to the durability of the connection, parliamentary history shows that the connection will be durable if the type and design of the solar panels indicate that they are intended to stay on the land permanently.[46] However, the actual intention of the parties is only decisive to the extent that this intention is visible.[47] It is irrelevant whether the solar panels can be removed.[48]

With respect to non-integrated solar panels, one could argue that the solar panels have a limited lifetime of around twenty-five years and that the energy community that leases the roof does not intend for the solar panels to stay on the roof permanently. However, the lease is not visible. The type and design of the solar panels rather indicate the opposite because they are attached to the roof in a stable manner. The fact that they can be removed easily is irrelevant. Also, the house has to be equipped with special facilities for the electricity generated by the solar panels, and the solar panels are visibly linked to the house and the electricity

43. Hof 26 Juni 2018, ECLI:NL:GHAMS:2018:2113, para. 3.3 (Neth.).

44. K.L.G. Berger & W.L.J. Kremer, *Zonnepanelen: stimuleringsmaatregelen en verhuurscenario's*, 19 BOUWRECHT 127, 131 (2017).

45. *See* HR 15 Januari 2010, ECLI:NL:HR:2010:BK9136 (Neth.); *see* HR 24 December 2010, ECLILNL:HR:2010:BO3644 (Neth.); E.F. Verheul, *Eigendomsvoorbehoud, bestanddeelvorming en natrekking*, 7053 WPNR 237, 241 (2015).

46. C.J. VAN ZEBEN ET AL., PARLEMENTAIRE GESCHIEDENIS VAN HET NIEUWE BURGERLIJK WETBOEK - BOEK 3: VERMOGENSRECHT IN HET ALGEMEEN 70 (1981).

47. *Id.* at 69.

48. HR 31 Oktober 1997, ECLI:NL:HR:1997:ZC2478, para. 3.3 (Neth.); HR 25 Oktober 2002, ECLI:NL:HR:2002:AE6999, para. 3.4.2 (Neth.).

grid. These are aspects that the Dutch Supreme Court used to substantiate a durable connection in its case law.[49] Arguably, the landowner would also become owner of the non-integrated solar panels, and the energy community would lose their ownership of the solar panels.[50] It should be noted though that there are recent judgments of lower courts that draw the opposite conclusion.[51]

B. The Right of Superficies: The Status Quo

The right of superficies could separate the ownership of the solar panels from the landownership.[52] The right of superficies is a limited property right, based upon an agreement with the landowner and good against the whole world, that allows a person who is not the landowner to install and own an object that is durably united with the land. In this way, the right of superficies accommodates fragmented interests in the land. As holder of a right of superficies with respect to the solar panels, the energy community could keep their ownership and create a security right of hypothec in the solar panels. The downside of this option is the costs involved — the parties have to go to a notary, sign a notarial deed, and have it registered in the public records.[53] While these increased costs could reduce the number of buildings with solar panels, standardization has substantially reduced costs over the past years. While in the past, each notary drew up their own deed at high costs for the parties of around 6,000 EUR, there is now a model deed recognized by the Royal Association of Notaries (KNB) and the Dutch Association of Banks (NVB) that has driven down costs for a right of superficies to 1,500 EUR.[54]

In addition to costs, another hurdle is whether a right of superficies can actually be created for all types of solar panels. For this purpose, solar panels have to qualify as a "work" under Art. 5:101(1) BW,[55] which determines the objects for which a right of superficies can be created. It is settled that solar panels that are not integrated can be the object of a right of superficies.[56] By contrast, it is disputed whether a right of superficies can be created to separate the ownership of

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49. HR 31 Oktober 1997, ECLI:NL:HR:1997:ZC2478, para. 3.2 (Neth.).

50. Berger & Kremer, *supra* note 44, at 131; *cf.* HR 27 September 2013, ECLI:NL:HR:2013:CA0813, para. 3.3.3 (Neth.).

51. *See generally* Rb Overijssel 3 September 2024, ECLI:NL:RBOVE:2024:4694 (Neth.); Rb Overijssel 15 November 2022, ECLI:NL:RBOVE:2022:3361 (Neth.).

52. Art. 5:101 BW.

53. *See* Art. 3:89 BW; *see also* Art. 3:98 BW.

54. A.H.G. Wilod Versprille & M. Wever, *Verduurzaming in de notariële praktijk: het standaardmodel opstalakte zonnepaneleninstallatie*, *in* DUURZAAM WONEN: KNB PREADVIEZEN 2019, at 141 (L.C.A. Verstappen & F.J. Vonck eds., 2019). That said, this assessment is in part too simplistic because, often, solar panels are installed on condominiums (a property split in apartment rights; *appartementsrechten*). For a right of superficies to be created, at least a four-fifth majority will have to change the deed of division, leading to lengthy and costly procedures.

55. This provision reads as follows in English: "The right of superficies is a right *in rem* to own or to acquire buildings, works or vegetation in, on or above an immovable thing owned by another."

56. Hoops, *supra* note 36, at 300-01.

solar panels that are part of the façade or serve as roof tiles. While the parliamentary history and some authors indicate that component parts cannot be made independent through a right of superficies,[57] more recent literature advocates for a more generous and nuanced approach to the creation of the right of superficies.[58]

Even this approach, however, offers little hope for integrated panels for now. It sets two requirements for a "work." First, the thing is sufficiently identifiable.[59] Secondly, separating the ownership of the thing from the landownership must be economically acceptable. Economic acceptability pertains to one of the goals of accession.[60] Accession is supposed to protect the added value of uniting two things.[61] The value of the bricks of a house when they together form the house is higher than the aggregated value of all detached bricks. By turning the bricks into one legal unit, accession deters the owner or other persons, in particular their creditors, from taking the house apart and thereby preserves this added value. Economic acceptability as a criterion is intended to prevent the right of superficies, which separates the ownership of an object from the landownership and thus makes it easier to remove that object, from frustrating this goal of accession.[62] See sub-section VIII.A below for a more detailed account of the goals of these criteria.

The *status quo* in the debate about the two criteria seems to be that the solar panels will only be sufficiently identifiable if there is some degree of physical separation or independence of the solar panels.[63] Unlike non-integrated ones, integrated solar panels could not meet this requirement. Whether or not the separation would be economically acceptable would therefore be irrelevant. There could thus be no separate right of ownership and no hypothec on integrated solar panels under the *status quo*. A right of emphyteusis (*erfpacht*), which confers a right to use the solar panels as if its holder were owner and on which a hypothec can be created, is no option either for the same reasons.[64]

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57. VAN ZEBEN ET AL., *supra* note 46, at 355; H.D. PLOEGER, HORIZONTALE SPLITSING VAN EIGENDOM 217 (1997); E.C.M. Wolfert, *Bestanddeel of zaak? Over het onderscheid en de samenhang tussen de artikelen 3:4 en 5:20 BW*, 6523 WPNR 191 (2003); E.C.M. Wolfert, *Bestanddeel of zaak? Over het onderscheid en de samenhang tussen de artikelen 3:4 en 5:20 BW*, 6525 WPNR 279 (2003).

58. BARTELS & VAN VELTEN, *supra* note 40, at 248; P.J. van der Plank, *Is het mogelijk art. 3:4 BW bestanddelen te verzelfstandigen door middel van het vestigen van een recht van opstal*, 7108 WPNR 399 (2016); W.M. Kleyn, *Wat is onroerend en wat is roerend?*, JBN, Nov. 1, 1995.

59. *See, e.g.*, van der Plank, *supra* note 58, at 402; *see also* PLOEGER, *supra* note 57, at 213.

60. F.J. VONCK, DE FLEXIBILITEIT VAN HET RECHT VAN ERFPACHT 61 (2013); *cf.* H.W. Heyman & S.E. Bartels, *Is een huis bestanddeel van de grond? Een rechtsgeleerde dialoog tussen H.W. Heyman en S.E. Bartels*, NTBR, Sept. 1, 2006, at 7 n.8.

61. P.J. VAN DER PLANK, NATREKKING DOOR ONROERENDE ZAKEN 133 (2016); W.H.M. REEHUIS & E.E. SLOB, PARLEMENTAIRE GESCHIEDENIS VAN HET NIEUWE BURGERLIJK WETBOEK - INVOERING 3, 5 EN 6, BOEK 3: VERMOGENSRECHT IN HET ALGEMEEN 76 (1990).

62. VONCK, *supra* note 60, at 61.

63. *Cf.* A.J. Mes et al., *Eigendom van onroerende zaken, met name natrekking (titels 1 en 3)*, *in* BOEK 5 BW VAN DE TOEKOMST 159 (L.C.A. Verstappen ed., 2016); *see generally* Rosalie Koolhoven, *Gebouwen en hun bestanddelen in een meer circulair goederenrecht: Van een wegwerpeconomie naar een kringloop van hoogwaardige, modulaire producten die worden verdienstelijkt*, *in* CIRCULAIR BOUWEN 5, 35 (2018).

64. VONCK, *supra* note 60, at 61.

C. Alternatives

Where, as is the case with integrated solar panels, a right of superficies cannot be created to separate the ownership of the solar panels from the landownership, notaries and other legal "architects" have to come up with unorthodox designs. A contract of lease, for instance, gives the lessee a right to remove improvements under Art. 7:216 BW.[65] The energy community could lease the roof or façade on which the solar panels will be placed. However, this right or the contract of lease itself cannot serve as security for the bank of the energy community.[66] The lease contract could be linked with a step-in right for the bank so that if the energy community defaults on their loan, the bank can assign the lease to a new operator of the solar panels.[67] In addition, such solutions are only now being refined and, unlike the model deeds for the right of superficies, still require expensive legal "tailoring." The parties will thus have to incur considerable additional costs, while lenders are reluctant to embrace unorthodox designs. This poses an enormous legal obstacle to developing renewable energy installations and related business models further.

V. GERMANY

The German Civil Code (*Bürgerliches Gesetzbuch*; BGB) stipulates what forms part of a thing in sections 93-96 BGB. Sections 946-947 BGB provide who the owner is of a thing that is composed of different things that were the object of separate property rights before they were combined. An important difference from Dutch law is that both of these groups of provisions connect to "essential components" (*wesentlicher Bestandteil*) as the criterion for what forms the object of the right of ownership. While German law thus only applies one criterion, Dutch law applies two criteria, specifically "common opinion" and "durable unity" with different outcomes.

Buildings are essential components of the land under section 94(1) BGB. As the solar panels are put on the roof of a building, the essential question is whether they constitute essential components of the building. Section 93 BGB stipulates that essential components of a thing are any objects that cannot be separated from the thing without destroying or changing the nature of the objects or the thing. Section 94(2) BGB specifically adds regarding buildings that the objects that serve the construction of the building and remain integrated into it after completion, constitute essential components of the building and, as a consequence, the land.

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65. This provision reads as follows in English: "Up until the eviction the lessee is entitled to undo and remove the changes and additives he has introduced, provided that the leased property is brought back to a condition which at the end of the lease period reasonably can be regarded as being in conformity with its original state."

66. C.H.A. van Oostrum, *(On)zekerheden bij het financieren van het product-als-dienstmodel*, 28 ONDERNEMING EN FINANCIERING 27, 41-42 (2020); R.M. Wibier, *Servitization en goederen- en insolventierecht*, 7326 WPNR 416, 421 (2021) (A pledge can be created in rights to remove based upon contract).

67. M.M.G.B. van Drunen & I.C.J. Hoving, *Opstalloos financieren van dakprojecten voor zonnepanelen*, 7387 WPNR 689 (2022).

Integrated solar panels are, without any doubt, essential components of the building because they form part of the roof or façade and the building would not be complete with a hole.[68] By contrast, solar panels that are not integrated are generally not essential components of the building because they can be removed without substantial damage and the building will still serve its purpose.[69] Such solar panels will only be essential components if they exclusively provide this specific building with electricity and no electricity is fed into the public grid.[70] The rationale behind this conclusion is that the solar panels cannot serve their purpose without the building.

Non-integrated solar panels are generally independent things, and the energy community will remain their owner.[71] Such solar panels can be the object of a security transaction. For security purposes, the ownership of solar panels can be transferred to the lender of the energy community. Once the energy community has paid off their debt, they will get the ownership back, either automatically or upon a transfer.[72]

By contrast, under section 946 BGB, solar panels that are an essential component of the building are, by operation of law and against the will of the parties, owned by the landowner. The energy community would lose the ownership. That said, German law provides for an important exception to the qualification of objects integrated into buildings as essential components. Section 95(2) BGB preserves the legal independence of things where they are only integrated into the building "for a temporary purpose" (*zu einem vorübergehenden Zweck*). This exception also applies where energy communities use somebody else's roof or façade for their integrated solar panels and non-integrated solar panels that do not feed electricity into the public grid. The temporary purpose, based upon the intentions of the party installing the solar panels,[73] must be clear from the factual circumstances and the legal relationship between the energy community and the

68. BGB § 94, as interpreted by Christina Stresemann, *in* MÜNCHENER KOMMENTAR ZUM BÜRGERLICHEN GESETZBUCH, para. 32 (Franz Jürgen Säcker et al. eds, 9th ed. 2021) [hereinafter MÜKO-BGB]; BGB § 94, as interpreted by Jörg Manfred Mössner, *in* BECK-ONLINE.GROSSKOMMENTAR BGB, para. 24.1 (Beate Gsell et al. eds., 2023) [hereinafter BECKOGK-BGB]; Oberlandesgericht [OLGZ] [Higher Regional Court] Nuremberg Oct. 10, 2016, ECLI:DE:OLGNUER:2016:1010.14U1168.15.0A, para. 24. (Ger.).

69. BGB § 94, as interpreted by Christina Stresemann, *in* MÜKO-BGB, para. 33; Oberlandesgericht [OLGZ] [Higer Regional Court] Nuremberg Oct. 10, 2016, ECLI:DE:OLGNUER:2016:1010.14U1168.15.0A, paras. 24-27 (Ger.); Oberlandesgericht [OLGZ] [Higher Regional Court] Oldenburg Sept. 27, 2012, ECLI:DE:OLGOL:2012:0927.12W230.12.0A, para. 5 (Ger.).

70. BGB § 94, as interpreted by Jörg Manfred Mössner, *in* BECKOGK-BGB, paras. 26, 26.1; BGB § 94, as interpreted by Christina Stresemann, *in* MÜKO-BGB, para. 33.

71. BGB § 97, as interpreted by Christina Stresemann, *in* MÜKO-BGB, para. 33 (Noting that non-integrated solar panels qualify as accessories (*Zubehör*) of the building in terms of § 97 BGB). This entails risks in case the landowner sells and transfers the land and the building with "accessories" (presumed under § 311c BGB). Buyers acting in good faith may acquire the solar panels even though the energy community is owner of the solar panels; §§ 926, 932-936 BGB. For this reason, a model contract by *NÜMANN+SIEBERT Rechtsanwälte* (on file with author) foresees the registration of a servitude in favour of the energy community, which would prevent the good faith on the part of the buyer.

72. BGB § 930, as interpreted by Fabian Klinck, *in* BECKOGK-BGB, paras. 64-66, 198-203.

73. BGB § 95, as interpreted by Jörg Manfred Mössner, *in* BECKOGK-BGB, para. 9.

landowner. If the energy community contractually leases the roof or façade from the landowner, it will be presumed that the solar panels are only temporarily integrated into the building and belong to the energy community that installed them.[74] Importantly, this presumption even holds where the lease concerns the whole lifetime of the solar panels.[75] Also, even a very solid connection with the building, as is the case with integrated solar panels, does not stand in the way of a temporary purpose.[76] To further ensure that the solar panels will be the property of the energy community, the parties should agree that the energy community will remove the solar panels after their lifetime has expired.[77]

Things that are not essential components due to their integration with a temporary purpose can serve as collateral in the same way as other independent things. The energy community can transfer them for security purposes to their lender.

VI. ITALY

Italian law presents yet another solution. Two interacting provisions govern the ownership of solar panels attached to the roof or façade. Under Art. 812(1) of the Italian Civil Code (*Codice civile*; CC), buildings and other works (*costruzioni*) are immovable property if they are permanently or temporarily united with the land. Unless the law or a valid title provides otherwise, the ownership of the immovable property vests in the owner of the land, according to Art. 934 CC. This provision is an expression of the doctrine of accession (*accessione*).

In order for the solar panels to become immovable, they must be connected, directly or indirectly, with the land in such a way that they lose their physical autonomy and that a separation would substantially change the building.[78] In practice, neither the strength of the connection with the land nor its permanent or temporary nature will be decisive for the qualification as immovable property. Rather, it is of particular importance whether the solar panels perform a valuable function for the land.[79] Based upon this criterion, there does not seem to be much doubt that both integrated and non-integrated solar panels will, in the vast majority of cases, be immovable property because they provide electricity. Confirming this conclusion, a notice issued by the Italian tax authority in 2013 qualified solar panels on roofs as immovable property.[80]

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74. *Id.* § 95(1); BGB § 95, as interpreted by Christina Stresemann, *in* MÜKO-BGB, para. 18; BGB § 95, as interpreted by Jörg Manfred Mössner, *in* BECKOGK-BGB, paras. 10.1, 44.

75. BGB § 95, as interpreted by Jörg Manfred Mössner, *in* BECKOGK-BGB, para. 10.3; *see id.* at n.122.

76. BGB § 95, as interpreted by Christina Stresemann, *in* MÜKO-BGB, para. 18; BGB § 95, as interpreted by Jörg Manfred Mössner, *in* BECKOGK-BGB, paras. 10.2, 11.

77. BGB § 95, as interpreted by Jörg Manfred Mössner, *in* BECKOGK-BGB, para. 10.2.

78. ANDREA TORRENTE & PIERO SCHLESINGER, MANUALE DI DIRITTO PRIVATO 188-189, 299 (Franco Anelli & Carlo Granelli eds., 25th ed. 2021).

79. Art. 812 c.c., as interpreted by Rosamaria Ferorelli, *in* CODICE CIVILE COMMENTATO (Mariconda Vincenzo & Alpa Guido eds., 2013).

80. AGENZIA DELLE ENTRATE, IMPIANTI FOTOVOLTAICI – PROFILI CATASTALI E ASPETTI FISCALI (Dec. 19, 2013), https://def.finanze.it/DocTribFrontend/getContent.do?id={3B5AB640-E772-44BB-BB0B-2B9FBA269ED9}.

Under Art. 952 CC, the parties can create a right of superficies (*superficie*), permanent or limited in time, for the energy community to have the right to put the solar panels on the roof or façade and to separate the ownership of the solar panels from the landownership. In practice, this limited property right is frequently used for solar panels.[81] Once the right of superficies has been created, a right of hypothec (*ipoteca*) can be created in favour of the lender of the energy community.[82] These legal acts will involve substantial costs for the notarial deeds and their registration,[83] estimated to be 4,000 EUR for notarial fees, 9% of the project value for the registration and 0.25% of the loan taken out in banking taxes. Unlike in the Netherlands, there is no apparent discussion about whether integrated solar panels as part of the roof or façade can regain their legal independence. There does not seem to be any ground in the rules on the right of superficies on which to distinguish between integrated and non-integrated solar panels.

VII. SOUTH AFRICA

Energy communities are not yet common in South Africa, but there is significant social and political interest in moving to green energy alternatives, especially in light of the national energy crisis under the national energy provider, Eskom.[84] As its lower middle and middle class generally cannot afford to acquire solar panels as alternative electricity systems, removing legal obstacles to accessing financial resources for households and energy communities should be a key priority if the anticipated unbundling and partial privatization of Eskom and the decentralization of energy in South Africa are to be a success.[85]

Sub-section VII.A explains that it is unclear whether accession would take place and who would be owner of the solar panels. Unlike Dutch and Italian law, South African law has not received a comparable right of superficies from Roman law.[86] Sub-section VII.B sets out alternative mechanisms for energy communities to retain control of the solar panels and to create security rights in them.

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81. TORRENTE & SCHLESINGER, *supra* note 78, at 311; Francesca Bartolini, *Le comunità energetiche - I contratti di godimento per lo sviluppo delle comunità energetiche*, 12 GIUR. IT. 2781 (2023).

82. Art. 2810(1) n.3 c.c. (It.).

83. Art. 2643 c.c. (It.).

84. *See generally* Rural Maintenance (Pty) Ltd and Others v. Eskom Holdings SOC Ltd and Another (2023/027739) [2023] ZAGPJHC 354 (20 April 2023) (S. Afr.) (Illustrating tensions where a solar plant in the town of Frankfort in South Africa lost a case against Eskom on a technicality, resulting in it being forced to dump solar generated electricity even though Eskom was unable to provide electricity for the residents of the town.).

85. See, e.g., Masuku, *supra* note 5, at 482; *see generally* Wolpe & Reddy, *supra* note 5. Some sectional title schemes do make use of solar panels to provide sectional title holders with electricity, but this is usually only in well-off schemes. In such a case, the body corporate of the sectional title scheme would pay for and install the solar panels, usually funded by levies from the sectional title holders.

86. C.G. VAN DER MERWE, SAKEREG 538 (2d ed. 1989).

A. Accession

South African law has received the rule of *superficies solo cedit*, whereby everything that has been erected on land is regarded as forming part of it.[87] One of the most influential and prevalent manifestations of this rule is accession by building (*inaedificatio*).[88] Accession by building is a form of original acquisition of ownership and pertains to the permanent attachment of moveable things to immovable property.[89] On the basis of this maxim, the owner of the land becomes the owner of the acceded structure, since the movable property loses its independent identity by becoming "an integral part of the immovable."[90] As there is no statute stipulating whether solar panels affixed to land or a building would be owned by the landowner and no longer by the energy community, the question will be decided with reference to the common law as it has been developed by the South African courts. The following sub-sections set out this test and apply it to solar panels.

1. The Common Law Test of Accession

A three-pronged test is used to determine whether a thing has attached to the building. This test has been developed in South African law with reference to Roman, Roman-Dutch, and arguably also English law.[91] The three factors to consider are:

i) the nature and purpose of the movable thing.

ii) the manner and degree of attachment of the movable thing to the immovable thing.

iii) the intention of the owner of the movable thing in respect of the attachment of their thing to the land or immovable property at the time of attachment.[92]

The application of these three factors (and the respective weight attached to each of them) have caused practical difficulties in South African law for several decades, with the test leading to diverging approaches in case law.

Early case law such as the 1915 case of the Appellate Division, *Macdonald Ltd v Radin NO and the Potchefstroom Dairies and Industries Co Ltd*,[93] is regarded

87. GUSTAV MULLER ET AL., SILBERBERG AND SCHOEMAN'S THE LAW OF PROPERTY 166 (6th ed. 2019); *see* CYRIL GODFREY HALL, MAASDORP'S INSTITUTES OF SOUTH AFRICAN LAW: VOL II - THE LAW OF PROPERTY 36 (9th ed. 1971) (The rule of superficies solo cedit is also sometimes stated as the *mazim omne quod inaedificator solo cedit*).

88. *See* VAN DER MERWE, *supra* note 86, at 245.

89. MULLER ET AL., *supra* note 87; *but see* Ina Knobel, *Accession of movables to land, South African law and Dutch law*, 45 CILSA 77, 87 (2012) (Contesting accession by building).

90. USS Graphics (Pty) Ltd and Others v. Urban Print Factory (Pty) Ltd and Others (30921/2019) [2023] ZAGPJHC 1119 (14 February 2023) para. 17 (S. Afr.).

91. VAN DER MERWE, *supra* note 86, at 247.

92. MULLER ET AL., *supra* note 87, at 166.

93. MacDonald Ltd v. Radin NO and the Potchefstroom Dairies & Industries Co Ltd 1915 (454) AD (A) at 466 (S. Afr.).

as the primary authority for the "traditional approach" to accession in South African law.[94] In *Konstanz Properties (Pty) Ltd v Wm Spilhaus en Kie (WP) Bpk*,[95] the court explained that the traditional approach does not consider the third (subjective) factor when the first two factors provide a definitive answer that accession had occurred.[96]

The traditional approach is contrasted to a new approach, which emphasizes the subjective intent in the third factor of the test.[97] This new approach was adopted in cases such as *Theatre Investments (Pty) Ltd v. Butcher Brothers Ltd*[98] and *Melcorp SA (Pty) Ltd v. Joint Municipal Pension Fund (Tvl)*,[99] where the court considered that all the evidence had to be evaluated together and that the court should then decide, on a balance of probabilities, whether the annexer intended for the movable to be permanently affixed.[100] Under the new approach, the intention of the annexer is paramount, and the other factors are factors from which the intention can be determined.[101]

Academics such as *Van der Walt* and *Sono* have been critical of the view of a clear-cut shift from a traditional to a new approach in respect of the subjective intention.[102] According to *Van der Walt* and *Sono*'s analysis, the factors have always been interlinked to some degree, with evidence pointing to the position that "both early and recent cases have emphasized, more or less strongly, the intention of the owner of the movable to determine whether or not accession had occurred."[103] *Van der Walt* and *Sono* do stress that the objective factors remain important.[104]

2. The Adjustment of the Test to Industry Practices

The traditional three-pronged test is arguably difficult to apply in a predictable fashion since there is limited clarity on the weight and relevance of the individual factors. The unpredictable nature of this area of South African property law is well illustrated by the case of *USS Graphics (Pty) Ltd v Urban Print Factory*

94. Konstanz Properties (Pty) Ltd. v. Wm Spilhaus en Kie (WP) Bpk 1996 (3) SA 273 (A) (S. Afr.).

95. *Id.*; *see also* MULLER ET AL., *supra* note 87, at 168.

96. Konstanz Properties (Pty) Ltd. v. Wm Sphilhaus en Kie (WP) Bpk 1996 (3) SA 273 (A) at 281 (S. Afr.); *see also* AJ van der Walt & Nhlanhla L. Sono, *The law regarding inaedificatio: A constitutional analysis*, 79 THRHR 195, 196 (2016); Knobel, *supra* note 89, at 79.

97. van der Walt & Sono, *supra* note 96, at 196.

98. Theatre Investments (Pty) Ltd and Another v. Butcher Brothers Ltd 1978 (3) SA 682 (A) (S. Afr.).

99. Melcorp SA (Pty) Ltd v. Joint Municipal Pension Fund (Tvl) 1980 (2) SA 214 (WLD) (S. Afr.).

100. Theatre Investments (Pty) Ltd and Another v. Butcher Brothers Ltd 1978 (3) SA 682 (A) at 688 (S.Afr.); *see also* Unimark Distributors (Pty) Ltd v. Erf 94 Silvertondale (Pty) Ltd 1999 (2) SA 986 (TPD) (S. Afr.) (confirming the existence of these approaches and the discussion by Van der Walt & Sono).

101. Knobel, *supra* note 89, at 80 (see the brief overview of a possible third approach, where the purpose of the annexation is considered the most important consideration, but this approach has garnered limited support, and we do not discuss it further here.); *see also* MULLER ET AL., *supra* note 87.

102. van der Walt & Sono, *supra* note 96, at 203; *see also* Warren Freedman, *The test for* inaedificatio*: what role should the element of subjective intention play?*, 117 S. AFR. L.J. 667, 670 (2002).

103. van der Walt & Sono, *supra* note 96, at 203.

104. *Id*.

(Pty) Ltd,[105] where the High Court considered whether a large printing machine had attached to the building. This case provides an interesting set of facts to consider the application of the test to determine whether *inaedificatio* had taken place and specifically brings to the fore the role that commercial interests and industry customs and standards can play.

The court referred to the three relevant factors to consider in its inquiry to determine whether accession had taken place, namely the nature of the thing, the manner of its attachment, and the intention of the owner of the movable at the time of its annexation.[106] The court correctly stated that the first two factors are objective while the third factor is subjective in nature.[107] Relying on *Macdonald Ltd v Radin NO and the Potchefstroom Dairies and Industries Co Ltd*,[108] the court further stated that every case stands to be considered on its own facts,[109] presumably meaning that it is a contextual inquiry with the factors acting as guidelines rather than definitive rules. The court's approach could also be taken to mean that precedent is of limited value in this area insofar as every case is unique, and the three-pronged test highlights the importance of the specific factual context in which accession must be considered.

Finally, the court stated that the subjective intention factor is often regarded as the most important, due to it being the deciding factor in the event of an uncertain or equivocal result when applying the first two factors to a particular set of facts,[110] but pointed out that it accepted that the "requirements" are interlinked.[111] The interlinked nature of the factors is highlighted by the fact that if the first two factors yield a clear answer ("a clear inference of [objective] intention"), then "there is no need to consider evidence pointing to a contrary subjective intention."[112] This is reminiscent of the traditional approach discussed in the previous sub-section.

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105. *See generally* USS Graphics (Pty) Ltd and Others v. Urban Print Factory (Pty) Ltd and Others (30921/2019) [2023] ZAGPJHC 1119 (14 February 2023) (S. Afr.) (This case discussion is based on Elsabé van der Sijde & Sameera Mahomedy, *Property Law*, 4 YEARBOOK S. AFR. L. 1181, para. 2.3 (2023), and the authors have benefited from a discussion with the Pretoria Property Law Reading Group on 25 July 2023, which was led by Prof. Warren Freedman).

106. *Id.* para. 18 (citing P.J. BADENHORST ET AL., SILBERBERG AND SCHOEMAN'S THE LAW OF PROPERTY 140 (4th ed. 2003)).

107. USS Graphics (Pty) Ltd and Others v. Urban Print Factory (Pty) Ltd and Others (30921/2019) [2023] ZAGPJHC 1119 (14 February 2023) para. 18 (S. Afr.).

108. MacDonald Ltd v. Radin NO and the Potchefstroom Dairies & Industries Co Ltd 1915 (454) AD (A) at 466 (S. Afr.).

109. USS Graphics (Pty) Ltd and Others v. Urban Print Factory (Pty) Ltd and Others (30921/2019) [2023] ZAGPJHC 1119 (14 February 2023) para. 18 (S. Afr.).

110. *Id.* para. 19; *see also* MULLER ET AL., *supra* note 87, at 167.

111. It is unclear why the court's language shifted from factors to requirements since the three prongs of the test for accession are not requirements and this terminology is best avoided. The court's earlier use of factors is apt.

112. USS Graphics (Pty) Ltd and Others v. Urban Print Factory (Pty) Ltd and Others (30921/2019) [2023] ZAGPJHC 1119 (14 February 2023) para. 19 (S. Afr.). (first citing MacDonald Ltd v. Radin NO and the Potchefstroom Dairies & Industries Co Ltd 1915 (454) AD (A) at 467 (S. Afr.).; and then citing Unimark Distributors (Pty) Ltd. v. Erf 94 Silvertondale (Pty) Ltd. 1999 (2) SA 986 (T) at 998G–I (S. Afr.)).

In *USS Graphics*, the printer in question weighed ninety-eight tons and was installed in the building with the intention of operating at that location for the life cycle of the machine, approximately ten years.[113] Correspondingly, the owner of the building made substantive changes to the building to accommodate the machine, which was not bolted down but held in place by its weight.[114] It would take up to two weeks to dismantle the printer, with reassembling taking up to two months.[115] Another machine would have to be shut off for a period of time, or even potentially dismantled, to remove the printer from its location.

To reach its decision, the court made reference to the opinions of two expert witnesses, noting specifically that the machines were regarded as "intrinsic to the business, but not to the functioning of the building,"[116] and that "[i]t is not unusual for structural changes to be made to buildings before installing or moving printing presses of this nature. These changes may include removing or replacing walls or windows and strengthening foundations."[117]

In respect of industry standards, industry experts commissioned by the applicants informed the court that "[e]ven Web Offset or Newspaper presses which may occupy several floors of a building, are not considered to be permanent fixtures, but rather separate moveable entities which can be moved and re-assembled elsewhere."[118] It could not be treated simply as a big heavy machine: it had to be considered as a big heavy machine *in the printing industry*.

The court accepted that it was customary ("standard practice") in this industry for these machines to be dismantled and removed at significant cost to repair the damaged premises and that they were not regarded as permanent fixtures. In doing so, the court developed the test for the first factor — the nature of the thing. The court's approach to the second factor — the manner of attachment — was also generous and influenced by the industry custom: despite its removal causing significant damage to the building, the court was willing to regard the machine as not having attached. Although it would be difficult to remove, it was not impossible and not contrary to expectations in the industry. In this respect, the court sought to ensure that the judgment was fair, practical and in line with industry standards.[119]

The court's engagement with industry standards is an interesting and potentially positive development in property law: courts fulfill a crucial role in ensuring that the rules and principles of property law are fair and suitable to modern commercial realities. One of the criticisms of the "new" approach, where all factors are considered together on a balance of probabilities or where intention is the most important, is that it can give undue weight to the intention of the owner of the

113. *Id.* paras. 20.1-20.2.

114. *Id.* paras. 20.3-20.4.

115. *Id*. para. 20.5.

116. USS Graphics (Pty) Ltd and Others v. Urban Print Factory (Pty) Ltd and Others (30921/2019) [2023] ZAGPJHC 1119 (14 February 2023) para. 20.7 (S. Afr.) (emphasis omitted).

117. *Id*. para. 21.2.

118. *Id*. para. 21.3.

119. *Id*. para. 29.

movable property.[120] This can conflict with the publicity principle, which emphasizes objective, not subjective, intent.[121] In considering industry standards when applying the "nature of the thing" and the "manner of attachment" factors, further weight can be given to objective factors that reflect the objectively determined expectations of the parties that can be ascertained by third parties.

Based upon these facts in the context of the specific industry, the court held that the first two factors did *not* point to a definitive result. Following the traditional approach,[122] the court went on to consider the third factor, the intention of the owner of the movable.[123]

In the case, the owner of the factory had purported to sell the printing machine. The court held that they could not have held any subjective intention that the printer had attached to the building, since it would have been regarded as having lost its independent identity and therefore would have been impossible to transfer separately.[124] In sum, the court held that none of the factors of the test indicated that accession had taken place and that the printing machine was a movable.[125]

A similar approach to that of *USS Graphics* was followed also in *Choppies Supermarkets (SA) (Pty) Limited v Heriot Properties (Pty) Limited*,[126] where the court held that racks and shelving had not attached to the immovable property, despite significant costs involved in removing them.[127] Furthermore, the court regarded the agreement between the parties "that the shelving and racking fell within the ambit of a covering notarial bond,"[128] a form of security for movable property, as indicative of the racking and shelving being able to be removed and held that accession had not taken place.

3. Application to Solar Panels

The legal position regarding attachment of solar panels to immovable property has not yet been clarified through statute or case law and is therefore still an open question in South African law. Courts are likely to continue following a flexible approach, taking all three factors into account. Given that the test is highly contextual and will be influenced by all the facts of a specific matter, it is worth

120. *See* Freedman, *supra* note 102, at 667 (Analyzing the implications of the subjective element of the test).

121. van der Walt & Sono, *supra* note 96, at 205.

122. *See generally* van der Sijde & Mahomedy, *supra* note 105 (discussing the court's lack of engagement with key cases such as Konstanz Properties (Pty) Ltd. v. Wm Sphilhaus en Kie (WP) Bpk 1996 (3) SA 273 (A) (S. Afr.)).

123. USS Graphics (Pty) Ltd and Others v. Urban Print Factory (Pty) Ltd and Others (30921/2019) [2023] ZAGPJHC 1119 (14 February 2023) para. 22 (S. Afr.).

124. *Id*. para. 25.

125. *Id*. para. 27.

126. Choppies Supermarkets (SA) (Pty) Ltd v. Heriot Properties (Pty) Ltd (015457/2024) [2024] ZAGPJHC 1654 (1 March 2024) (S. Afr.).

127. *Id*.

128. Deeds Registries Act 47 of 1937 § 102 (S. Afr.) (A notarial bond under the Deeds Registries Act 47 of 1937 is "[a] bond attested by a notary public hypothecating movable property generally or specially").

considering factors that might influence how the three prongs of the general test are applied.

First, based on *USS Graphics* and *Choppies Supermarket*, discussed in the previous sub-section, the fact that removal might cause damage to the immovable property is not likely to be a deciding factor by itself. Second, the intention of the parties will remain prevalent, especially where there is evidence that both parties had that specific intention. Third, the development of an industry standard or practice might carry weight if or when the matter finally comes before a court.

Brits has put forth the view that solar panels could go the way of geysers, which, while easily removable, are considered a fixture.[129] This makes sense for rooftop solar systems on detached houses, which are most common in South Africa at the moment, but would be inconvenient for energy communities putting solar panels on roofs of third parties. However, as *Brits* indicates, the potential weight given to the subjective intent of the parties could mean that a situation could arise where two identical solar panels systems are installed in identical ways, but, due to the subjective intention factor, one could attach to the immovable property while the other may not.[130] Such uncertainty may be a significant barrier to accessing financing for the installation of solar panels. *Brits* rightly argues that a desire of financiers to retain ownership cannot dictate the outcome of the accession test as this would amount to "the tail wagging the dog," although *Brits* does recognize that in the past, courts have considered the existence of an agreement to retain ownership, a secured credit financing strategy, significant.[131] This constitutes a criticism of the court's approach in *Choppies Supermarket*, where the court considered the existence of a notarial bond significant.

The legal position of owners of solar panels installed on third-party property is thus unclear in South African law, which affects the possibilities of creating security rights to finance the installation of said panels. What can be said at this point is that save for legislative interference, the legal position will have to be clarified by the courts on a case-by-case basis and would be determined with reference to the type of solar panels, the way that they are attached to the property, and the intention of the owner of the solar panels at the time of building. Moreover, if energy communities developed a strong "industry practice," there is some authority, albeit only at the High Court level, that this may be taken into account. We submit that if non-integrated solar panels are installed on third party property in a manner easily removable, with minimal or no damage to the existing structure, and with the intention to remain movable, the courts are likely to and should accept that these installations are movable property, if only to preserve existing energy community business models. By contrast, integrated solar panels are, in our view, very likely to be immovable property.

129. Reghard Brits, Rooftop Solar Panels: Movable or Immovable? (2024) (unpublished manuscript) (on file with authors).

130. *Id.*

131. *Id*.

B. Instruments for Energy Communities to Retain Control and Create Security Rights

Depending on contextual factors, it might be possible for solar panels on roofs to be immovable or movable property in South African law. We therefore discuss the possibilities for the energy community to retain control of the solar panels and to create real security over them in both scenarios. Business models for energy communities with solar panels can fund their installation by selling "shares" in the specific project, via a so-called "crowd-sale" or "crowd-fund."[132] However, due to limitations of scalability of such an approach, we conclude that traditional means of financing, via secured credit, remain prevalent.

1. Immovable Property

We first consider the scenario where solar panels are deemed to have attached and therefore form part of the immovable property of a third party. We recall that South African law does not recognize a right of superficies.[133]

In South African law, it is possible to create a security right over immovable property by way of a mortgage bond. A mortgage bond is a "bond attested by the registrar specially hypothecating immovable property."[134] Section 102 of the Deeds Registries Act 47 of 1937 includes in the definition of "immovable property" a registered long lease (of at least ten years). This provides a useful mechanism for energy communities to retain control of solar panels and obtain funding for them: the energy community could negotiate to register a long lease over the immovable property or a part thereof, such as the roof, and then register a mortgage over the long lease (which would include operation of the solar panels).[135]

One limitation to note is that, where immovable property is already burdened with a mortgage, the first mortgagee has the right to prevent the debtor from further burdening the property without the mortgagee's consent. This power could preclude energy communities from being able to register a mortgage bond over a long lease.

There are also costs involved in registering a mortgage bond, but the costs would not be prohibitively high, depending on the value of the transaction and duration of the agreement, which cannot be for less than ten years. For example, the costs of registration for a loan worth one to two million South African rands (roughly, 50,000 to 100,000 euros) amount to 1,544 rands (roughly, 80 euros), and the conveyancer is supposed to charge 24,560 to 34,485 rands (roughly, 1,300 to

132. *See, e.g.*, *Completed solar projects*, SUN EXCH., https://sunexchange.com/projects/ (last visited Nov. 17, 2024).

133. VAN DER MERWE, *supra* note 86, at 538.

134. Deeds Registries Act 47 of 1937 § 102 (S. Afr.); *see also* G. MULLER ET AL., GENERAL PRINCIPLES OF SOUTH AFRICAN PROPERTY LAW 286 (1st ed. 2019) [hereinafter GENERAL PRINCIPLES OF SOUTH AFRICAN PROPERTY LAW].

135. *See* REGHARD BRITS, REAL SECURITY LAW 28 (2016) (discussing the definition of "immovable property" for purposes of a mortgage bond).

1,730 euros) according to the Law Society's Guidelines.[136] The registration of the mortgage bond provides notice to third parties, who can ascertain the burdens imposed on a property by accessing the deeds registry for a fee of the equivalent of five euros per deed.

2. Movable Property

If the solar panels are movable, the energy community remains owner but cannot use a mortgage bond to create a real security right. In cases where solar panels are classified as movable property, a notarial bond must be used to create a real security right.[137] The Deeds Registries Act provides for two types of notarial bonds: a special and a general notarial bond.[138] The former creates a real security right over specified assets, while the latter creates a general security right over all of the debtor's movable assets.[139] Notarial bonds that comply with the Security by Means of Movable Property Act 57 of 1993 provide a fully enforceable real security right, while bonds that do not fully comply with this Act will require for the bond to be "perfected" through the transfer of physical control of the movable property.[140] The costs of registration and conveyancing are roughly the same as with a mortgage bond.

Insofar as notarial bonds allow for the creation of a real security right over movable property without having to deliver the property to the creditor, they present a useful mechanism for energy communities seeking to finance a solar panel installation of third-party property through a secured finance transaction.[141] The legislative framework providing for registration of the notarial bond provides adequate notice to third parties. While there is an expense involved in creating a notarial bond, costs do not appear to be prohibitively expensive, with prices depending on a variety of factors, ranging from the size of the law firm used to the complexity of the transaction. It is our understanding that the total cost would not be disproportionate to the value of the solar panel installation and lease. However, as energy communities are not common in South Africa at this stage, it is difficult to draw any firm conclusions on whether this would provide a viable financing mechanism.

In addition to the option of creating and registering a special notarial bond over the movable property, a further option would be a retention of ownership

136. *See* Deeds Registries Act of 1937: Amendment of Regulations, GN R.4447 of GG 50239 (29 February 2024); L. SOC'Y OF S. AFR., CONVEYANCING: CONVENTIONAL DEEDS (ACT 47/1937) – GUIDELINE OF FEES (May 27, 2024), https://www.lssa.org.za/wp-content/uploads/2024/05/CONVEYANCING-FEE-GUIDELINES-27-MAY-2024.pdf.

137. South African law recognizes pledge as a way of creating a real security right over movables, but since it is a possessory form of real security, in the absence of attornment, it does not provide a useful solution to the question of financing solar panel installations on third-party property. *See* BRITS, *supra* note 134, at 108, 121-137.

138. Deeds Registries Act 47 of 1937 § 102 (S. Afr.)

139. GENERAL PRINCIPLES OF SOUTH AFRICAN PROPERTY LAW, *supra* note 134, at 303.

140. BRITS, *supra* note 135, at 230, 262-263.

141. GENERAL PRINCIPLES OF SOUTH AFRICAN PROPERTY LAW, *supra* note 134, at 318; *see also* BRITS, *supra* note 135, at 23.

agreement. In this case, the transfer of ownership is contractually suspended until the agreed purchase price has been paid.[142] These agreements are also known as hire-purchase agreements or installment agreements.[143] The retention of ownership of the movable property thus operates as a form of real security over the property: in the event of non-payment, the creditor would be entitled to reclaim the property using the *rei vindicatio*.[144] These agreements are subject to legislative control. For example, the National Credit Act 34 of 2005 can apply if the contract falls within the scope of the Act, and the Insolvency Act 24 of 1936 has a special provision for dealing with installment agreements in the event of the debtor's insolvency.[145]

VIII. REFORM

The review of the four jurisdictions shows that while they all use a doctrine of accession to determine the extent of a right of ownership and share similar criteria, the application of these criteria or special statutory provisions leads to diverging outcomes. While an express provision in the German Civil Code allows for party autonomy to break open accession to a large extent, the other jurisdictions do not have such a provision. Under Italian and Dutch law, the landowner will be owner of both types of solar panels. By contrast, accession under German law only targets integrated solar panels. To make the energy community owner again, a right of superficies can be created for all types of solar panels in Italy. By contrast, current Dutch law only provides for this way out to owners of non-integrated solar panels. South African law veers closest to German law insofar as the intention of the owner of the movable thing is taken into account, but the fate of solar panels in property law remains unclear, with integrated solar panels much more likely to be owned by the landowner than non-integrated ones.

This review shows that Dutch property law cannot facilitate the financing of, in particular, integrated solar panels through the option of security rights in the solar panels. Italy does facilitate such transactions but at the expense of substantially higher transaction costs in the form of notarial fees. In South Africa, there are financing mechanisms available for both scenarios, but it depends on the development of the common-law doctrine of accession whether or not energy communities can stay owner of the solar panels. Only under German law can energy communities create security rights in the solar panels with ease as German law gives effect to the parties' intention to attach the solar panels only temporarily.

It would be too simplistic to state that the doctrine of accession in Italy, the Netherlands, and South Africa and the right of superficies in the Netherlands have to be adjusted only to facilitate the work of energy communities. Such a statement easily invites resistance from property-law scholars who seek to protect doctrine from possibly temporary trends outside the legal arena. The Netherlands in particular has seen a large legal debate about such changes in recent years. The fol-

142. GENERAL PRINCIPLES OF SOUTH AFRICAN PROPERTY LAW, *supra* note 134, at 319.

143. *Id*.

144. *Id*.

145. *Id*.

lowing sub-sections discuss the arguments presented in favour of deactivating accession and, in the Netherlands, of a greater scope for the right of superficies. These arguments spring from the goals of accession (sub-section VIII.A), the recognition of common practices (VIII.B), improvements of the system of land registration (VIII.C), and a priority for party autonomy (VIII.D). An argument against deactivating accession across the board could be that for loans secured by rights in immovable property based upon a notarized and registered deed, such as solar panels targeted by accession, institutional lenders tend to charge lower interest rates.[146] The higher the value of a renewable energy project, the more likely it is for lower financing costs to outweigh the additional transaction costs caused by accession.

A. The Goals of Accession

In the reviewed jurisdictions, accession pursues up to four goals: protection of the *status quo*, the clear delineation of objects and property rights in them, the promotion of legal certainty, and the preservation of the economic value of the combination of objects. It is these legal goals that will increasingly require an approach different from the current one as the energy transition progresses.

The first goal, the protection of the *status quo*, is mentioned separately in the Dutch literature.[147] Traditionally, accession turns a composition of things owned by a single person into a single legal unit and thereby deters the owner or other persons from breaking the units apart. In the energy transition, by contrast, accession binds together what the parties do not want to be bound together *and* deprives the energy community of their ownership. Instead of protecting the *status quo*, accession turns out to undermine it. From the energy community's point of view, a more lenient interpretation of accession would be in order.

The second goal is legal certainty, which can be divided into two sub-goals. First, legal certainty can mean clarity. Accession needs to provide clear and stable rules on property law relations.[148] This sub-goal says very little about the content of these rules and only requires clarity and stability. The second sub-goal, by contrast, concerns the content of the rules. Accession is supposed to protect the confidence in the appearance of unity created by the connection between the land and a building or another thing so that third parties are not surprised by invisible rights in legally separate movable things.[149] The goal of legal certainty also underlies the criterion of sufficient identifiability for the right of superficies and its restrictive scope under Dutch law, excluding in particular rights of superficies with respect to integrated solar panels. Separating components from a building, it is

146. *See supra* note 31.

147. *See, e.g.*, IZAAK KISCH, BESCHOUWINGEN OVER DE ONDERSCHEIDING TUSSCHEN ZAKELIJKE EN PERSOONLIJKE RECHTEN 294 (1932).

148. *See, e.g.*, VAN DER PLANK, *supra* note 61, at 135; BGB § 93, as interpreted by Jörg Manfred Mössner, *in* BECKOGK-BGB, para. 5; Freedman, *supra* note 102, at 673; VAN DER MERWE, *supra* note 86, at 257.

149. *See, e.g.*, VAN DER PLANK, *supra* note 61, at 136; PLOEGER, *supra* note 57, at 34; BRITS, *supra* note 135, at 4.

said, cannot be made visible in a reliable and cost-effective manner.[150] By contrast, the importance of legal certainty as a goal of accession under German law is limited as the parties can deactivate accession through agreements on a temporary attachment under section 95 BGB.[151]

The first sub-goal discourages change in general because energy transitions and other forms of change entail uncertainty and litigation. However, once a more lenient interpretation of accession favouring the energy transition has been consolidated, this sub-goal would no longer pose an obstacle as long as the new interpretation with respect to renewable energy installations is clear. Moreover, the goal of ensuring stability would protect the consolidated interpretation. Particularly in the Dutch context, the second sub-goal at first glance appears to be an even bigger obstacle to a shift towards new rules because it seems that the confidence protected by accession that solar panels are legally bound to the building and land will persist in the energy transition. However, this is a misconception. As the energy transition progresses, common perception, for example in line with common practices in relevant economic sectors discussed in sub-section VIII.B, is likely to shift and people will no longer be surprised to find solar panels not forming a legal unit with a building. There would thus no longer be a justification for consolidating one legal unit. That said, a more lenient interpretation will nevertheless bring about more uncertainty because rights in movables are not registered and therefore invisible. However, as registers evolve, they can also include information on things that are attached to buildings, but do not form part of the land. Registers can already display rights of superficies pertaining to solar panels without major problems or costs. This shows that at least a more generous approach to the right of superficies would already now in no way contravene legal certainty. See also sub-section VIII.C below on improved systems of land registration.

The last goal of accession most clearly shows the need for reform from within. As already explained in sub-section IV.B above, accession is meant to preserve the added value of the unity of two things.[152] The same goal underlies the restrictive scope of the right of superficies.[153] However, in the energy transition, accession itself deters parties from combining solar panels and buildings — and thereby the creation of the very added value that it is supposed to protect. As several scholars have pointed out,[154] a more lenient interpretation of accession would thus reflect this goal better in the energy transition than the current approach.

The same reasons justify a more generous approach to the right of superficies in the Netherlands and, specifically, the second requirement for the solar panels to be qualified as a "work." As discussed in sub-section IV.B above,[155] the separation

150. VONCK, *supra* note 60, at 61.

151. BGB § 946, as interpreted by Martin Schermaier, *in* BECKOGK-BGB, para. 14.

152. *See, e.g.*, VAN DER PLANK, *supra* note 61, at 133; REEHUIS & SLOB, *supra* note 61, at 76; BGB § 93, as interpreted by Christina Stresemann, *in* MÜKO-BGB, para. 1.

153. VONCK, *supra* note 60, at 61.

154. Koolhoven, *supra* note 63, at 20, 44; Mes et al., *supra* note 63, at 164.

155. *See supra* Section IV.B.

of the ownership of the solar panels through a right of superficies must be economically acceptable. The familiar goal of this requirement is to prevent the added value created by a combination from being destroyed.[156] This goal would suggest that it should not be possible to create a right of superficies with respect to a brick because the loss of value caused by the brick's removal from the wall exceeds the value of the brick itself or the value it could add to another wall. In the context of solar panels, however, legally separating the solar panels from a building can actually preserve the value created by the combination of solar panels with buildings. If a right of superficies cannot be created for integrated solar panels, such panels are less likely to be financed, leased, or put on the roof of a third party. Hence, the additional value of the combination of such panels with a building is less likely to accrue. A restrictive scope for the right of superficies thus contravenes the goals that the requirement of economic acceptability is supposed to promote in this case.[157] The requirement itself is thus a strong indication for a more generous scope for the right of superficies.

B. Common Practices

Standard practices in an economic sector or other common practices have received particular attention under Dutch and South African law[158] as an argument to deactivate accession while ensuring legal certainty.[159] In the Netherlands, to ensure that solar panels, integrated or otherwise, do not form a single unit with the building, in addition to merely arguing for a reinterpretation of "common opinion" or "durable unity," scholars point to the *Radio Holland* judgment of the Dutch Supreme Court from 1979.[160] This judgment concerned movables installed in a ship. The essence of this judgment is that common practices whereby the owner of the ship does not acquire, but only leases movables installed in their ship, can create a common opinion that such movables do not form part of the ship. Scholars argue that once solar panels on the roofs of third parties or leases of solar panels have become common practice, common opinion would change and solar panels would stay movables independent from the building.[161] This proposal is related to the argument that as the energy transition progresses, the perception that a physical unit of a building and a solar panel implies a legal unit will fade away and will thus no longer be in need of protection.

C. Improved Systems of Land Registration

Dutch scholars also point to innovations in the field of land registration to show that deactivating accession will not pose a threat to legal certainty. Even

156. VONCK, *supra* note 60, at 61; *cf.* Heyman & Bartels, *supra* note 60, at 7 n.8.

157. *Cf.* Koolhoven, *supra* note 63, at 49; Mes et al., *supra* note 63, at 162.

158. For South African law, *see supra* Section VII.A.2.

159. *See, e.g.*, Koolhoven, *supra* note 63, at 36; Mes et al., *supra* note 63, at 162; VAN DER PLANK, *supra* note 61, at 25-26.

160. HR 16 Maart 1979, ECLI:NL:HR:1979:AC6518 (Neth.).

161. Mes et al., *supra* note 63, at 165; M.A.B. Chao-Duivis, *Privaatrechtelijke aspecten van de circulaire economie in het bijzonder circulair bouwen (Deel II)*, 154 TBR 1032, para. 7.3 (2017).

though they have yet to be introduced as public systems for information on land, the "3D-Kadaster"[162] and building passports like Madaster[163] are promising tools to ensure the publicity of rights in movables attached to buildings. Such systems would take away the need to rely on perceptions of the physical world for determining the shape of legal units, while at the same time preserving legal certainty.

With respect to the scope of the right of superficies, this argument already holds water with the current system of land registration in the Netherlands. It seems odd to rely upon the difference between components of a building and other immovable things to delineate the scope for the right of superficies. To ensure legal certainty, the first requirement for "works" in terms of Art. 5:101(1) BW, *i.e.*, they be identifiable, should instead be based upon what can actually be clearly circumscribed in a notarial deed and the land registration system and can then be identified in physical reality without significant problems.[164] Integrated solar panels definitely meet this requirement.[165]

D. Priority for Party Autonomy

The justifications for a reform presented up to here aim at deactivating accession with respect to solar panels on roofs generally. Another basis for a reform would be to let party autonomy prevail against the appearance of unity between the roof and the solar panels.

German law, through section 95 BGB, gives precedence to party autonomy if the purpose of the attachment is only temporary. Where objective factors cannot resolve the issue, the South African test of accession also gives precedence to party autonomy.[166] In the Italian literature, *Busani* has argued that a contractual lease that involves the right to put solar panels on the roof, to use and maintain them, and to remove them at the end of the contract, can deactivate the accession of the solar panels.[167] This would allow for security transactions, in the form of the creation of a pledge (*pegno*) in the solar panels, without the need to resort to a right of superficies. This argument would effectively introduce a rule that resembles section 95 BGB into Italian law. However, both the highest court (*Corte di Cassazione*) and doctrine have refused to give such a contractual arrangement third-party effect and thus to enlarge the party autonomy in shaping the objects of property rights in this way.[168]

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162. Mes et al., *supra* note 63, at 181; *see* A. Mes, *Driedimensioneel eigendom*, 7043 WPNR 1189 (2014).

163. Benjamin Verheye, *Toekomst van de circulaire vastgoedeconomie*, 1 TPR 107, 174-75 para. 42 (2019); Chao-Duivis, *supra* note 161, para. 7.3; Mes et al., *supra* note 63, at 164; *see Transforming the future of building together*, MADASTER, https://madaster.com/ (last visited Feb. 10, 2025).

164. Koolhoven, *supra* note 63, at 47.

165. Mes et al., *supra* note 63, at 161.

166. *See supra* Section VII.B.2 (discussing the relevance of ownership retention agreements in South African law); *see also* BRITS, *supra* note 129, at 4-5 (Prioritizing party autonomy is not uniformly regarded as the appropriate approach in South African law).

167. Angelo Busani, *Impianto fotovoltaico costruito su fondo condotto in locazione e principio di accessione*, 3 NOTARIATO 315 (2012).

168. Art. 934 c.c., as interpreted by Onofrio Troiano, *in* CODICE CIVIL COMMENTATO; ANTONIO GAMBARO, IL DIRITTO DI PROPRIETÀ 760 (1995).

In line with the view of the Italian courts, Dutch law sticks to the irrelevance of the parties' intentions. If parties could separate the ownership of things attached to the soil by agreement, the separation would not be visible to third parties. Unlike in Germany, the value judgment in the Netherlands seems to be that this would too greatly reduce legal certainty as to what the right of ownership includes.[169] Another aspect worth considering is that as accession impacts small-scale and large-scale projects differently, as indicated in the introduction to this section, a provision like section 95 BGB could offer small-scale projects the flexibility to avoid transaction costs for deactivating accession, while leaving accession in place for large-scale projects that would like to pay lower interest rates on their loans.

IX. CONCLUSION

Energy communities and other operators of small-scale renewable energy projects are in need of accessible financing opportunities and low transaction costs. In addition to equity and subordinated loans from members as well as subsidies, loans from commercial institutional lenders play an increasingly important role as the size of the project grows. However, such lenders will often require collateral, and the most suitable form of security in the energy community context tends to be a security right in the renewable energy installation.

When the energy community lack a suitable location for their renewable energy installation, such as a roof for their solar panels, they will have to place it on somebody else's land. The doctrine of accession can then deprive the energy community of their ownership by making the landowner owner of the renewable energy installation. If the *lex rei sitae* offers the option of a security right in a suitable limited property right, such as the right of superficies, the energy community can create a security right but at the expense of high transaction costs for notarial deeds. If there is no such option, the energy community will obtain no loan, pay higher interest rates, or have to provide more expensive forms of security.

This survey of Dutch, German, Italian, and South African law shows various approaches to this issue. German law will allow the energy community to deactivate the accession of solar panels by agreement because of the limited lifetime of solar panels, providing the security transfer of the renewable energy installation to the lender as an accessible form of security. Depending on the development of South African common law, South African law may also follow this route. By contrast, Dutch and Italian law make the landowner owner of the renewable energy installation but offer the right of superficies as a solution at the expense of higher transaction costs. That said, Dutch law adds an additional hurdle. Energy communities may not be able to create a right of superficies with respect to integrated solar panels and other components of the building. Even more creative legal tools will be needed for the energy community to provide security in such cases.

In the literature, scholars have made several arguments in favour of a reform, to deactivate accession in many cases. They rely upon the goals of accession, the development of common practices, improvements of the systems of land registration, and the importance of party autonomy to argue that energy communities and

169. VAN DER PLANK, *supra* note 61, at 136; PLOEGER, *supra* note 57, at 34; *cf.* Schermaier, *in* BECKOGK-BGB, *supra* note 68, § 946, para. 14.

other actors should remain owner of their renewable energy installations. These proposals are promising and should be considered by courts and legislatures in the course of a careful examination of their potential drawbacks, such as higher interest rates for loans secured by rights in movable property.