



**BUSINESS
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A ROCKY MOUNTAIN INSTITUTE INITIATIVE

THE DUTCH WIND CONSORTIUM

SUCCESSFUL AGGREGATION OF CORPORATE RENEWABLES BUYERS IN EUROPE

A CASE STUDY BY ROCKY MOUNTAIN INSTITUTE'S BUSINESS RENEWABLES CENTER (BRC)

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AkzoNobel
Tomorrow's Answers Today



Google

PHILIPS



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ABOUT ROCKY MOUNTAIN INSTITUTE

Rocky Mountain Institute (RMI)—an independent nonprofit founded in 1982—transforms global energy use to create a clean, prosperous, and secure low-carbon future. It engages businesses, communities, institutions, and entrepreneurs to accelerate the adoption of market-based solutions that cost-effectively shift from fossil fuels to efficiency and renewables. RMI has offices in Basalt and Boulder, Colorado; New York City; Washington, D.C.; and Beijing.



ABOUT THE BUSINESS RENEWABLES CENTER

Rocky Mountain Institute's Business Renewables Center (BRC) is a member-based platform that streamlines and accelerates corporate purchasing of off-site, large-scale wind and solar energy. With over 200 members, including major corporations, leading renewable energy project developers, and transaction intermediaries, the BRC embodies the know-how of the industry. Today, BRC members account for over 8 gigawatts of renewable energy, and more than 93% of corporate renewables deals to date have included a BRC member. With a goal to help corporations procure 60 gigawatts of renewable energy by 2030, the BRC is at the leading edge of the fastest-growing sector of renewable energy procurement.

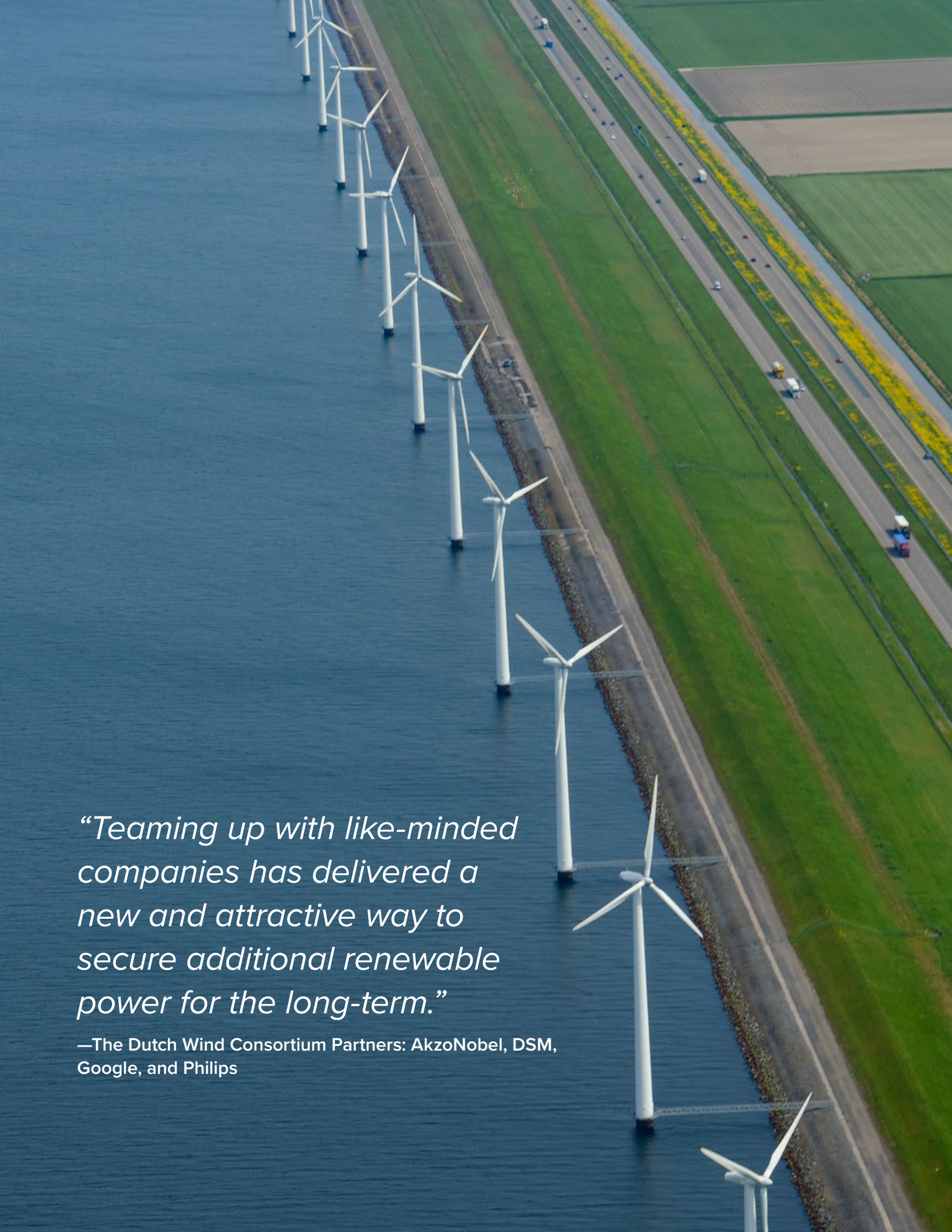
More information on BRC can be found at <http://www.businessrenewables.org>



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“Teaming up with like-minded companies has delivered a new and attractive way to secure additional renewable power for the long-term.”

—The Dutch Wind Consortium Partners: AkzoNobel, DSM, Google, and Philips

01 INTRODUCTION

Why a case study on the Dutch wind consortium

Four companies—AkzoNobel, DSM, Google, and Philips—have formed a unique partnership to jointly negotiate power purchase agreements (PPAs) with wind projects in the Netherlands.

Known as the “Dutch wind consortium,” this group executed its first PPA in October 2016, enabling the construction of the 102 MW Krammer Wind Park project. The consortium signed a second PPA in December 2016, which will lead to the construction of the 34 MW Bouwdokken Wind Park project.

The consortium represents a potentially replicable model for multiple renewables buyers to aggregate

their electricity demand under a single PPA deal. This case study offers insight into the planning and execution of this model.

The BRC team interviewed AkzoNobel, DSM, Google, and Philips (the consortium partners) in June 2017 to develop this case study, which is structured as follows.

1. The consortium partners and their sustainability commitments
2. The benefits and challenges of the consortium model
3. The consortium aggregation process
4. The PPA structure of the consortium’s deals
5. Appendix I: Summary of lessons learned
6. Appendix II: Overview of the Dutch market

Aggregation of Renewables Buyers

Aggregation in a PPA is the process of two or more buyers contracting for parts of the capacity of a single renewable energy generation project.

Aggregation can be driven by buyers, for example by organizing themselves in a consortium, or offered as a service by suppliers or intermediaries.



THE CONSORTIUM PARTNERS AND THEIR SUSTAINABILITY COMMITMENTS

This section briefly introduces the four companies that form the Dutch wind consortium. Each of the partners has public sustainability commitments with specific renewable energy goals. Below is a summary of their renewable energy targets and links to additional information.



AkzoNobel

AkzoNobel, a chemicals company, is motivated by social responsibility, seeking the strategic and economic advantages of procuring energy locally from renewable sources. AkzoNobel has set goals to be carbon neutral by 2050 and achieve 45% renewable energy by 2020.

More about AkzoNobel: <https://www.akzonobel.com/about-us/what-we-do/sustainability>



Royal DSM (DSM)

DSM, a health, nutrition, and materials company, has a target of sourcing 50% of its purchased electricity from renewables by 2025, and ultimately reaching 100%. Sustainability has been one of the core pillars of DSM's company strategy for the past two decades.

More about DSM: <https://www.dsm.com/corporate/sustainability.html>



Google

Google, a technology company, is committed to sourcing 100% renewable electricity and expects to reach this goal in 2017. Google wants to lead the acceleration of renewable energy adoption and focuses on buying renewable energy on the grids where it has data centers and other significant operations.

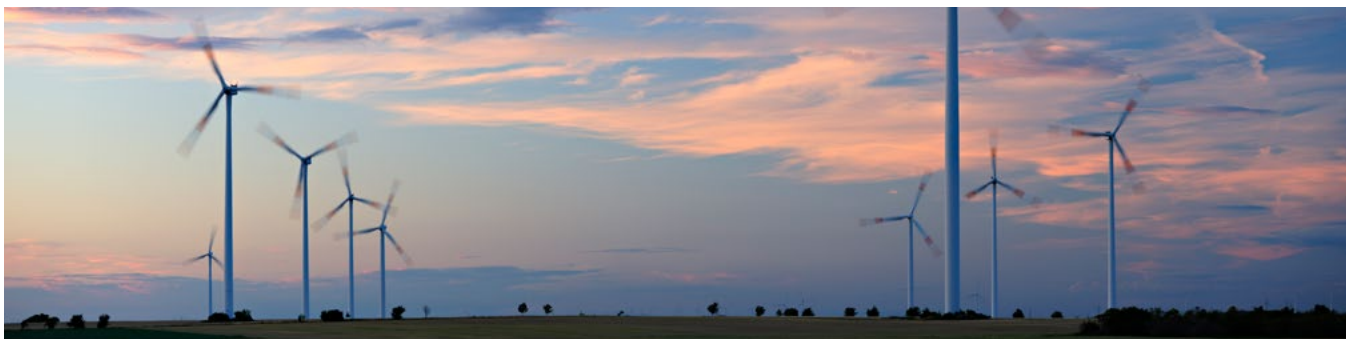
More about Google: <https://environment.google/>



Royal Philips (Philips)

Philips, a health technology company, has committed to carbon neutrality for its global operations by 2020, which includes purchasing 100% of electricity from renewable sources. This is part of Philips' five-year sustainability program, "Healthy people, sustainable planet."

More about Philips: <http://www.philips.com/a-w/about/sustainability.html>



THE BENEFITS AND CHALLENGES OF THE CONSORTIUM MODEL

This section provides an overview of the advantages of pursuing PPA deals collaboratively through a consortium model, and some of the main challenges faced by AkzoNobel, DSM, Google, and Philips in setting up and managing a consortium.

THE BENEFITS OF A CONSORTIUM APPROACH

The consortium partners feel there are distinct advantages to acting as a consortium and procuring renewable electricity in aggregation. The most important benefits include:

Advantages of the consortium model

- Economies of scale
- Saving and sharing costs
- Portfolio diversification and risk management
- An easily replicable structure

Economies of scale

Through the consortium, each partner contracts 25% of the renewable generation project's output. By working together, the consortium partners enabled the development of a larger project than certain individual members had appetite for, benefiting from economies of scale and consequently access to more favorable pricing.

Saving and sharing costs

The consortium partners shared expertise in a range of areas, including commercial structure, accounting, legal, and deal negotiation. Pooling knowledge reduced the cost of external advisors (when compared to each partner undertaking a separate transaction). To the extent that external advisors were required, the partners shared equally the fees and transaction costs.

Portfolio diversification and risk management

Procuring a smaller portion of a project's output can support building a more diversified renewable PPA portfolio. This aggregated approach provides more

favorable risk exposure when compared to signing a larger PPA as the sole off-taker.

An easily replicable structure

The consortium's first transaction required reaching an agreement on governance before moving on to scanning the market for projects and deal negotiations. Because of this, the first deal, from inception to closing, took 36 months.

This time investment paid off: the consortium partners put in place a flexible, nonincorporated consortium that allows for simple procurement of multiple PPAs. The second PPA of the consortium took around six months.

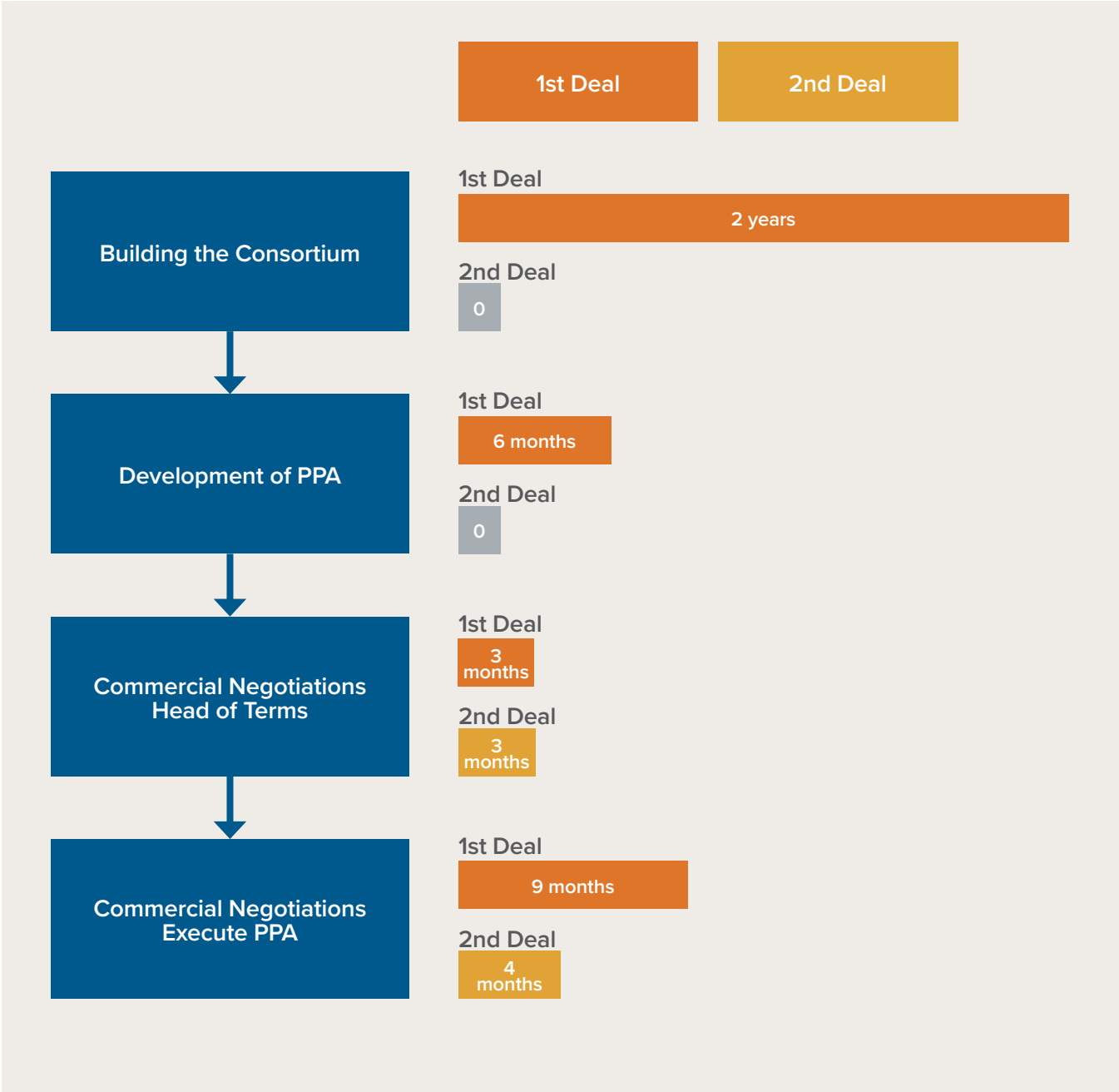
Gary Demasi, director of data center energy and location strategy at Google, sums it up: "Working in a consortium enables individual companies to tackle bigger projects. Once you put the structure together, that can be quite powerful, as it allows for replicability."

The development timeline of both transactions shows how the consortium partners succeeded in creating a replicable structure, with significant time and cost savings.

Developing consortium governance and negotiating the first PPA contract together took three years. The same contract structures were employed for the second transaction, saving more than two years of time and cost.

Overall PPA execution time was halved the second time around, thanks to having governance and contract structures already in place. The time required to negotiate terms with the project developer was not materially reduced.

FIGURE 1
DEVELOPMENT TIMELINE OF THE CONSORTIUM'S TWO PPAS



THE CHALLENGES WITH THE CONSORTIUM MODEL

Setting up and managing a consortium of buyers is not without its difficulties. Below is a summary of the key challenges faced by the consortium partners and the solutions they adopted.

The following section of the case study, the consortium aggregation process, deals with challenges and solutions in greater detail.

Challenges with the consortium model

- Partner selection
- Complexity of transaction
- Governance structure
- Ongoing management

Partner selection

Partners with strong motivation and commitment should be selected to ensure the success of the initiative. AkzoNobel, which initially conceived the consortium idea, achieved this by reaching out to companies with shared values, including a strong commitment to sustainability.

Complexity of the transaction

The complexity of a new transaction structure can be initially difficult for consortium partners and project developers alike. To overcome this challenge, the consortium partners worked closely with each other and with the developers, sharing in-house knowledge and expertise.

Governance structure

Finding an appropriate governance structure to be agreed on among the consortium partners took almost two years. In the end, the consortium partners opted for a very simple governance structure that allowed them to proceed with deal negotiations.

Ongoing management

The ongoing management of the consortium requires coordination at two levels: between consortium partners, and within each company. The consortium partners have successfully established clear rules and processes to allocate roles and powers.



04 THE CONSORTIUM AGGREGATION PROCESS

This section of the case study documents the process of how the four companies went from the initial idea of a consortium, to looking for prospective partners, to setting up and managing a successful consortium that has executed two deals to date.

THE SELECTION OF THE RIGHT PARTNERS

In 2014, AkzoNobel began considering new strategies for meeting its renewable energy commitments. In alignment with its corporate culture of support for collaborative opportunities, the AkzoNobel energy team envisioned a consortium of buyers procuring renewable electricity together from projects in the Netherlands.

With the help of a consultant, AkzoNobel set out to recruit partner companies. It felt it was essential that its partners be like-minded and strategically aligned. The ideal partner's profile included a strong brand and sustainability culture, and similar electricity load in the Netherlands.

A shared strong commitment to sustainability has been essential to ensure cultural fit and motivation throughout the aggregation process. "We looked for companies with strong sustainability leadership," said Marcel Galjee, energy director at AkzoNobel. "Similar culture, goals, and passion are essential to ensure a good fit between the people."

Lessons learned on how to find the right partners

- Alignment of strategy and goals is an effective way to screen potential partners
- Working with strong brands lends credibility and power in negotiation
- Cultural fit enables easier and more functional working relationships

Additionally, having companies with strong brands as partners was important to lend credibility to the initiative and add power in negotiation. It has also provided project developers with trusted names when seeking finance, which the consortium partners hoped would reduce the cost of financing, thereby reducing the price of the renewable energy.



From left to right; Simon Braaksm, Marc Oman, Hans Westerveld, Joost Sandberg, Sim van der Linde. Photo courtesy Sim van der Linde, DSM.

THE CHOICE OF WIND PROJECTS IN THE NETHERLANDS

The consortium partners emphasized their common strategic interest in securing cost-effective renewable electricity in the Netherlands. AkzoNobel, DSM, and Philips are Dutch companies with significant power consumption in their domestic market, while Google operates energy-intensive data centers in the country.

The consortium partners have all made public pledges to achieve renewable electricity targets. Sim van der Linde, project director at Royal DSM said, “We decided to set a specific target for renewable electricity because having more specific targets is instrumental to change. It drives focus and attention, and it helps accelerate progress.”

Seeking innovative ways to procure renewables, the consortium partners had already independently approached their local electric utilities to explore their options. These traditional suppliers offered them bundled renewable energy and guarantee of origin (GO) certificates, the equivalent of U.S. renewable energy certificates (RECs), at a premium on the regular electricity tariff.

The consortium partners decided that procuring renewable electricity in the form of traditional electricity tariffs combined with GOs did not meet their strategic objectives because it lacked cost-competitiveness and a direct link with renewable energy generation projects. It also did not meet the consortium partners’ wish to bring new, additional renewable energy capacity online.

Instead, a direct PPA contract with a new renewable project was a more appealing option to buy cost-effective electricity, and to acquire GOs for their corporate sustainability goals. Wind projects offered the most attractive economics and became the companies’ first choice.

THE CHOICE OF A SIMPLE GOVERNANCE MODEL

The consortium uses a simple governance structure. A consortium agreement, executed alongside each PPA, sets out the basic terms for cooperation for each deal. On an ongoing basis, consortium governance involves a steering group, a working group, and a rotating chair on behalf of the consortium partners.

A consultant initially recommended that a newly incorporated entity be set up for the consortium. After over a year of seeking agreement on the terms for incorporation, however, the partners realized that such a structure was not only difficult to agree upon but actually not required to pursue deals.

“The key catalyst in narrowing down the options for the consortium’s governance was an attractive project opportunity that came up, forcing the consortium partners to act,” said Sim van der Linde, project director, DSM.

The partners’ eagerness to start negotiating PPA terms with project developers drove the adoption of a simple consortium agreement. This allowed the partners to negotiate multiple deals using the same aggregation structure, by executing very similar consortium agreements alongside each PPA.

The willingness to move past governance discussions into real negotiations with developers also helped select the concretely interested parties. Other companies took interest in the consortium and initiated conversations with AkzoNobel, but were unable to move forward at the same pace as the four partners.

In the words of Joost Sandberg, renewable energy development manager, AkzoNobel: “There was a natural process in partner selection that worked really well. While it took time to get there, it was not the consortium that pushed people out; instead, it asked people if they were in.”

THE ROLE OF EACH PARTNER IN THE CONSORTIUM

Having set out basic terms for cooperation, the four consortium partners organized deal negotiation and execution based on collaboration and division of responsibilities. They all had in common an eagerness to be actively involved.

“You need to find partners who are eager and willing to take the lead. Having companies who join just for the benefits will not work,” said Marjolein Lemmens, legal counsel, DSM.

The four consortium partners worked closely together to define a common approach to PPA negotiation, drawing from each company’s in-house expertise and prior experience with PPAs, both in the Netherlands and internationally. They jointly discussed, refined, and agreed upon the final PPA commercial and legal structure.



Photo courtesy Tijmen Keesmaat

On certain activities, the partners agreed that a division of responsibilities would be in the interest of the consortium, and allowed individual companies to take the lead in specific areas where they had expertise and strength. Individual consortium partners led on the following aspects of PPA deal negotiation:

- Communications – AkzoNobel
- Legal – DSM and Google
- Accounting – Philips

Economic valuation was part of each buyer’s internal decision-making, and the partners worked together to research and establish a common set of model assumptions. Each partner subsequently conducted independent financial modeling.

Lessons learned on how to manage a consortium

- Look for partners that are committed and willing to share the workload
- Keep governance simple, focus on what is required to procure energy
- Open conversations with developers early on to help drive an optimal structure to transact deals
- Ensure external advisors are focused on your business needs/objectives



Photo courtesy Tijmen Keesmaat

THE ROLE OF EXTERNAL ADVISORS

The consortium engaged external advisors to provide support in specific areas. Advisors played a valuable role, helping the consortium partners find renewable energy project opportunities and providing independent legal advice.

The consortium hired a consultant to review the Dutch market for attractive project opportunities, help the partners to shortlist approximately ten prospective projects, and facilitate preliminary conversations with project developers.

The developers of the two selected projects, Krammer Wind Park and Bouwdokken Wind Park, handled requests for offers from prospective buyers. With the consultant's support, the partners made successful bids.

ENSURING INTERNAL ALIGNMENT

The effectiveness of each deal team in securing support and formal approvals within their own organization has also been critical to the success of the consortium.

Before seeking approval from an executive committee or board, the deal teams worked with their accounting and legal departments and their treasury and communications teams to properly evaluate risk and develop a sound business case.

To secure internal alignment, the consortium partners found it useful to involve colleagues early in the process, and to harness individuals' personal interest in renewable energy and sustainability, as a way to create additional positive momentum.

"Internal buy-in is vital. Involving accounting, legal, and treasury before you present to an executive committee will make your case stronger," said Simon Braaksma, senior director, group sustainability, Philips.

05 THE PPA STRUCTURE OF THE CONSORTIUM'S DEALS

The consortium has signed two wind PPAs, contracting 102 MW of capacity in October 2016 and 34 MW of capacity in December 2016, with identical PPA structures. This section of the case study dives deeper into the deals' features, the way the buyers have managed risk, and the accounting issues faced.

THE DISTINCTIVE FEATURES OF THE CONSORTIUM'S DEALS

In addition to the buyers, three other parties played a role in the transaction: the **project developers**, which secured project finance based on the strength of the project's contract suite, including the consortium's PPA; the **Dutch government**, contributing a green top-up; and a **third party** hired to deliver the electricity produced by the projects into the buyers' portfolios. A visual representation of the transaction structure is on the following page.

New wind projects are financed and built

The consortium's PPAs have enabled the development of two wind projects by committing to the purchase of the electricity produced for 15 years. This helps the project developers that build and operate the projects secure project finance. When operational, Krammer and Bouwdokken together will add 136 MW of new renewable capacity to the Dutch grid.

A price collar system manages price risk

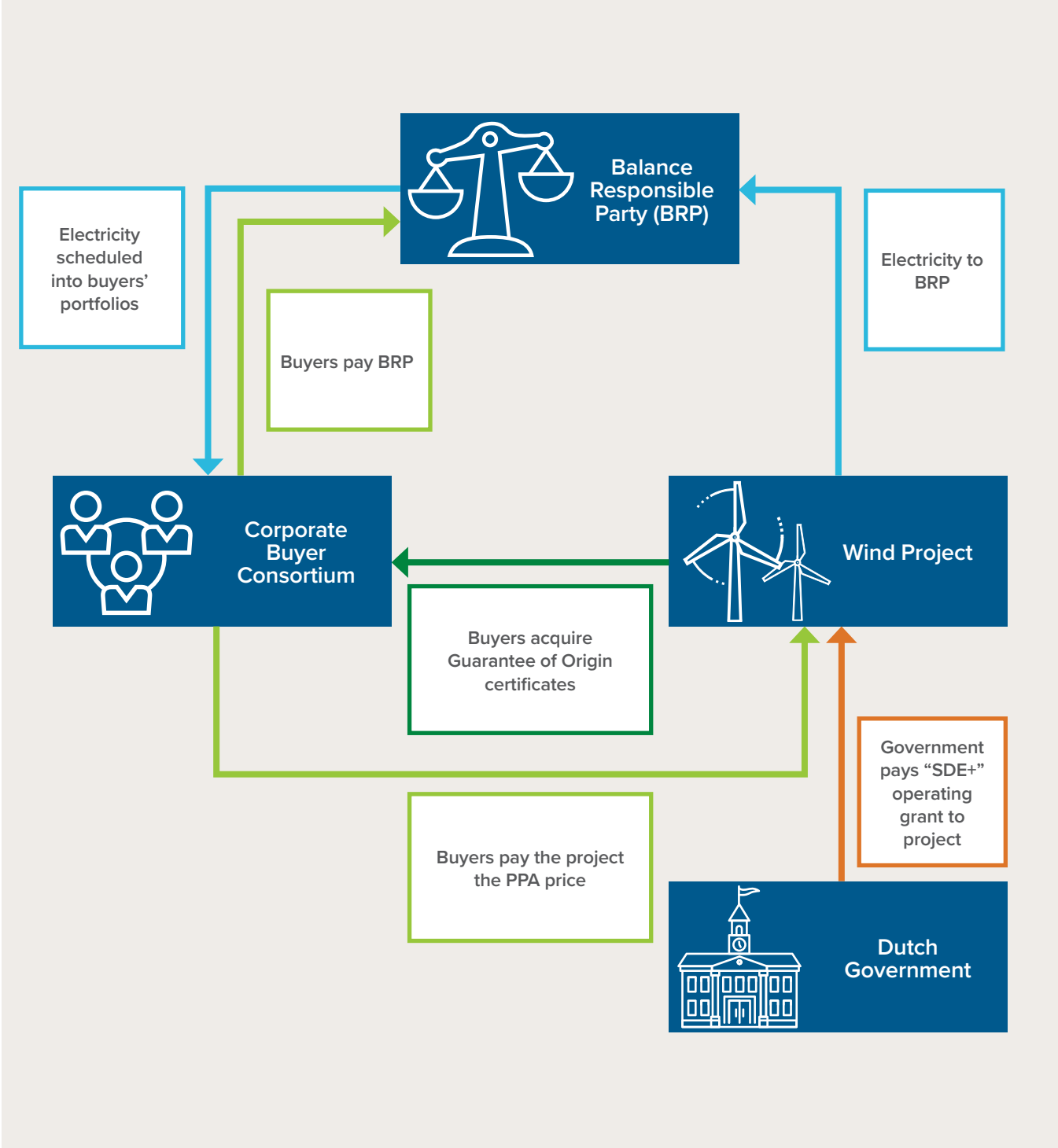
The consortium partners pay a PPA price based on the wholesale electricity prices traded on the Dutch APX energy exchange. Unlike most corporate PPAs in the U.S., this is a variable price that fluctuates based on supply and demand on the APX.

To manage price risk, the consortium partners and the developers have negotiated a price collar. When prices move below an agreed floor, the buyers pay a premium to boost prices. Conversely, when prices rise above a ceiling, buyers receive a discount. This system is intended to protect the project's revenues, while also shielding the buyers from higher prices.

Photo courtesy Tijmen Keesmaat



FIGURE 2
DEAL STRUCTURE OF THE CONSORTIUM'S PPAS



The projects receive the government's feed-in tariff

The Dutch government's "Stimulating Sustainable Energy Production" (*Stimuleren Duurzame Energieproductie*) support mechanism, known as SDE+, provides additional revenue to wind project developers for a period of 15 years. Appendix II: Overview of the Dutch market, offers more detail on how the mechanism works.

For the buyers, SDE+ enhances project economics and reduces the developer's reliance on PPA revenue to secure financing, therefore reducing the PPA price. For simplicity, the tenor of the consortium's PPAs matches the SDE+ 15-year timeline. The consortium partners sought a project in the Netherlands to align with their load and secure SDE+ support.

Buyers sign four identical PPA contracts

The consortium negotiated the PPAs as a group; however, each partner signed a separate contract with the project developer. The four contracts are identical: each partner takes an equal share of each project's output, and has the same terms, including price. This standardization reduced negotiation costs for the consortium buyers and also made things easier for the developer. The consortium also appointed a single point of contact for operational questions to ensure effective communications with the wind farm owner/operator.

Buyers purchase electricity and renewable attributes

In the consortium PPAs, the buyers take delivery of the electricity produced by the wind projects under a direct PPA. This is allowed by the full liberalization of the Dutch electricity market (see Appendix II). The PPA price also includes delivery of the GO certificates for all the electricity generated to the buyers.

The balance responsible party

In the Dutch electricity market, a licensed party needs to be responsible for scheduling the delivery of the electricity. Known as a balance responsible party

(BRP), paid by the buyers, the BRP schedules the output of the wind projects into each buyer's energy portfolio and balances from the volumes on the APX wholesale market.

HOW THE BUYERS MANAGE RISK

This section discusses how the consortium partners manage major types of risk in PPA transactions: price risk, risk of termination or default, availability and performance, basis risk, and congestion and curtailment risks.

Price risk

For a project developer, price risk is the chance that the PPA price will drop below the levels needed to finance and run the project. For a buyer, price risk is related to the price rising above the levels deemed to make the initiative economically viable.

To manage price risk, the buyers and the developers have agreed on a price collar system. When the APX wholesale price of electricity is between the agreed price "floor" and price "ceiling," the consortium partners pay a PPA price equal to the APX wholesale price of electricity minus a rebate.

When the PPA price falls below the agreed price floor, the buyers pay a premium, which allows the project to continue to earn sufficient revenue. Conversely, to protect the consortium partners against high prices, the PPA structure applies a discount on the wholesale price when the price rises above the agreed ceiling.

Risk of termination or default

Should any of the buyers become insolvent, such an event would impact that share of the project developer's revenue directly and could potentially impact the continuity of the deal for other buyers indirectly. This section discusses the terms that buyers and project developer have agreed upon to mitigate risk in such circumstances.

No joint and several liability

In a situation of default, the project developer is faced with the potential risk of disruption of cash flows, which in turn would jeopardize its loan repayments.

Joint and several liability

Joint and several liability in a PPA is when a project owner is allowed to hold PPA counterparties liable for the off-take of one of the other buyers, should any one buyer default or exit from the deal.

The consortium partners decided not to accept joint and several liability, and instead agreed upon other clauses with the project developer to mitigate the risk of one off-taker falling away. A solution was negotiated that allows the project developer to find an alternative buyer, and continue to sell its power without interruption, thus maintaining cash flows, while at the same time avoiding the need for joint and several liability among the remaining original buyers.

“As buyers, we were not willing to accept any form of joint liability. This was a fundamental point for us,” said Marc Oman, EU energy lead, Google global infrastructure.

Credit support

Market-standard credit-support guarantees were provided by both the buyers and the seller.

Availability and performance risk

The PPAs also include liquidated damages clauses related to delays and underperformance.

Once in operation, it is also essential to the buyers that the project deliver a sufficient volume of electricity. Exposure to related risks was shared between developers and buyers: the buyers take the volume risk related to the availability of wind resource, while the project developers guarantee a minimum technical availability of the wind parks.

Basis risk

One form of basis risk for a buyer in a PPA is the possibility that the PPA price and the price the buyer pays for electricity in the market will vary inconsistently, due to geographic or time differences. Inconsistent fluctuations in the size of the price delta need to be taken into account in economic forecasting. In the U.S., this risk originates from the large size of the markets.

The consortium partners' PPA transactions in the Netherlands are not exposed to this type of basis risk. The Dutch electricity market is highly liquid, and the consortium partners' loads and the settlement point for the projects are priced in the same market. For a comparable situation in a U.S. context, both generation and load would have to be located in the same hub.

Congestion and curtailment risks

Congestion and curtailment risks result from an excess of electricity supply in a location. This occurs when demand at that location and the ability to transmit excess electricity to other locations are insufficient to balance and supply.

Instances of excess supply, known as congestion, cause prices to fall and market players to react by producing less electricity. In extreme cases, when falling prices are insufficient to reduce supply, the grid operator must resort to ordering the curtailment—forced shutdown—of generators in order to maintain the safety of the grid.

The consortium partners consider the risk of grid congestion to be low, as no other projects are located or planned in the area, and the Dutch market has relatively low wind penetration. However, the partners found a way to address this potential risk in the PPA by including dispatch down rights.



Photo courtesy Tijmen Keesmaat

ACCOUNTING TREATMENT UNDER IFRS STANDARDS

European companies that issue securities that trade in a public market are required by the European Union to use International Financial Reporting Standards (IFRS) in their consolidated financial statements.

A key accounting issue—among others—in a PPA relates to the derivative treatment of the contract. This section summarizes how AkzoNobel, DSM, and Philips, which used IFRS for the consortium's PPAs, have dealt with this issue.

Most PPA buyers seek to avoid treating a transaction as a derivative. Derivative accounting requires recognition of the PPA on the buyer's balance sheet, and requires making adjustments to the derivative's value through the buyer's income statement, with an impact on profit and loss.

IFRS allow an exemption from derivative treatment if the reporting entity procures energy for its own use. AkzoNobel and DSM were able to qualify for this exemption, which is more accessible by energy-intensive companies. Philips duly recorded the PPA as a derivative.

"Because our exposure to market prices through these PPAs is limited, we were able to get our Executive Committee's approval of the deals more easily. Higher exposure might have required putting in place a hedge," said Simon Braaksma, senior director, group sustainability, Philips.

APPENDIX I: SUMMARY OF LESSONS LEARNED

This is a one-page summary of the lessons learned by AkzoNobel, DSM, Google, and Philips from executing two wind PPAs in the Netherlands through the consortium model.

THE ADVANTAGES OF A CONSORTIUM

Some of the advantages of pursuing PPAs through a consortium model include:

- Economies of scale
- Saving and sharing costs
- Portfolio diversification and risk management
- An easily replicable structure

CHALLENGES WITH A CONSORTIUM

Notable challenges in pursuing PPAs through a consortium model include:

- Partner selection (some lessons learned on this below)
- Complexity of the transaction
- Governance structure
- Ongoing management of the consortium (some lessons learned on this below)

THE SELECTION OF THE RIGHT PARTNERS

When looking for partners for a joint negotiation of a PPA, things to consider are:

- The prospective partners' alignment of strategy and goals
- Partners' brand reputation—strong brands lend credibility and power in negotiation
- Partners' culture—cultural fit enables easier and more functional working relationships

TIPS FOR RUNNING A SUCCESSFUL CONSORTIUM

Additionally, the following were found to be useful in setting up and running a consortium:

- Look for partners that are committed and willing to share the workload
- Keep governance simple, focus on what is required to procure energy
- Open conversations with developers early on to help drive an optimal structure to transact deals
- Ensure external advisors are focused on your business needs/objectives



APPENDIX II: OVERVIEW OF THE DUTCH MARKET

This appendix summarizes certain features of the Dutch electricity market relevant to a nonutility buyer of renewable electricity. It covers the liberalized nature of the Dutch energy market, the main form of government support of renewable production, and the possible structure of a corporate PPA deal.

POLICY AND MARKET OVERVIEW

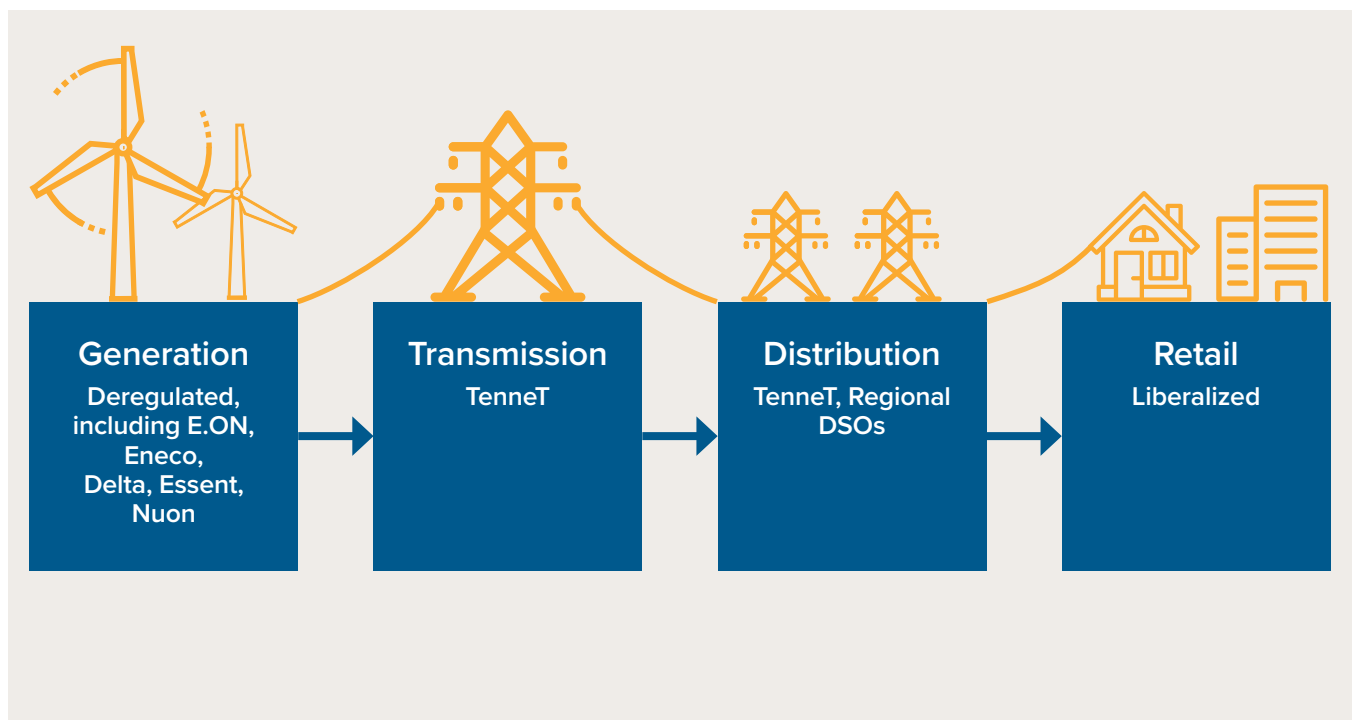
The 1998 Electricity Act liberalized the Dutch electricity market. The act uncoupled the regional utilities from electricity generation and retail operations, increasing market competition by allowing European companies to enter the market. Additionally, the act sought to reduce the carbon intensity of electricity generation.

Five firms dominate the Dutch electricity generation market: E.On, Eneco, Delta, Essent, and Nuon. The five dominant providers are subject to oversight by

the Authority for Consumers and Markets. TenneT, a state-owned system operator, manages transmission networks. Eight distribution companies manage the low-voltage distribution grid.¹

The Dutch government set a national goal of 14% renewable energy by 2020 and 16% by 2023. These goals are part of the National Renewable Energy Plan to increase renewables. In 2016, 5.9% of total energy was produced by renewables.²

FIGURE 3
STRUCTURE OF THE DUTCH ELECTRICITY MARKET



RENEWABLE ENERGY CERTIFICATES: GUARANTEES OF ORIGIN³

The Netherlands is part of the European system of renewable energy certificates, using guarantees of origin (GOs), which are similar to U.S. RECs. GOs are the tracking and trading mechanism used in Europe for renewable attributes of generation.

- GOs are actively requested and created by the project, and transferred to the procuring entity
- GOs generated by renewable energy projects in the Netherlands can be traded across Europe until retired by a claiming entity (or by a third party retiring on behalf of the claiming entity)
- GOs can be purchased separately from electricity (unbundled)

GOVERNMENT SUPPORT

The Dutch government has enacted regulation to support investments in renewable energy projects. The most important form of support is the *Besluit Stimuleren Duurzame Energieproductie* (stimulating sustainable energy production, known as SDE+) regulation.⁴

Enacted in 2011, the SDE+ mechanism bridges gaps between market prices (normally based on average spot prices on APX-ENDEX, the Dutch electricity exchange) and minimum reference prices established by the government.

SDE+ provides additional revenue to renewable energy projects producing electricity, gas, heat, or combined heat and power (CHP), to support an economic return to the project owner. Eligible electricity technologies are onshore and offshore wind, solar photovoltaic, hydropower, biomass, and geothermal. Depending on the technology, SDE+ provides support for five, 12, or 15 years.

SDE+ ensures that a renewable energy producer receives a minimum reference price, called a “maximum base amount,” sufficient to cover the cost of energy production. The SDE+ contribution is calculated as the difference between this maximum base amount and the average price of energy in the market, called a “correction amount.”

FIGURE 4

HOW THE SDE+ CONTRIBUTION IS CALCULATED

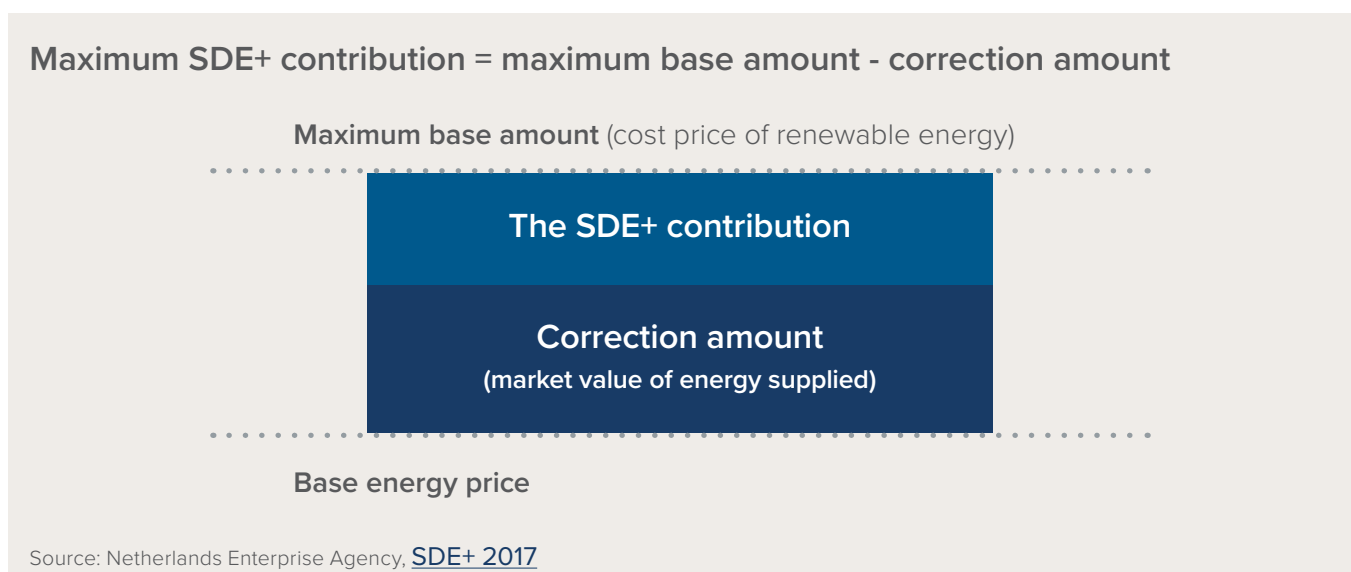




Photo courtesy Tijmen Keesmaat

SDE+ is paid only when this difference is positive, that is, when the market price is lower than the assured reference price, as shown in Figure 4, an image taken from the official 2017 SDE+ guide.

The [SDE+ guide](#) from the Netherlands Enterprise Agency provides additional information about the SDE+ support mechanism.

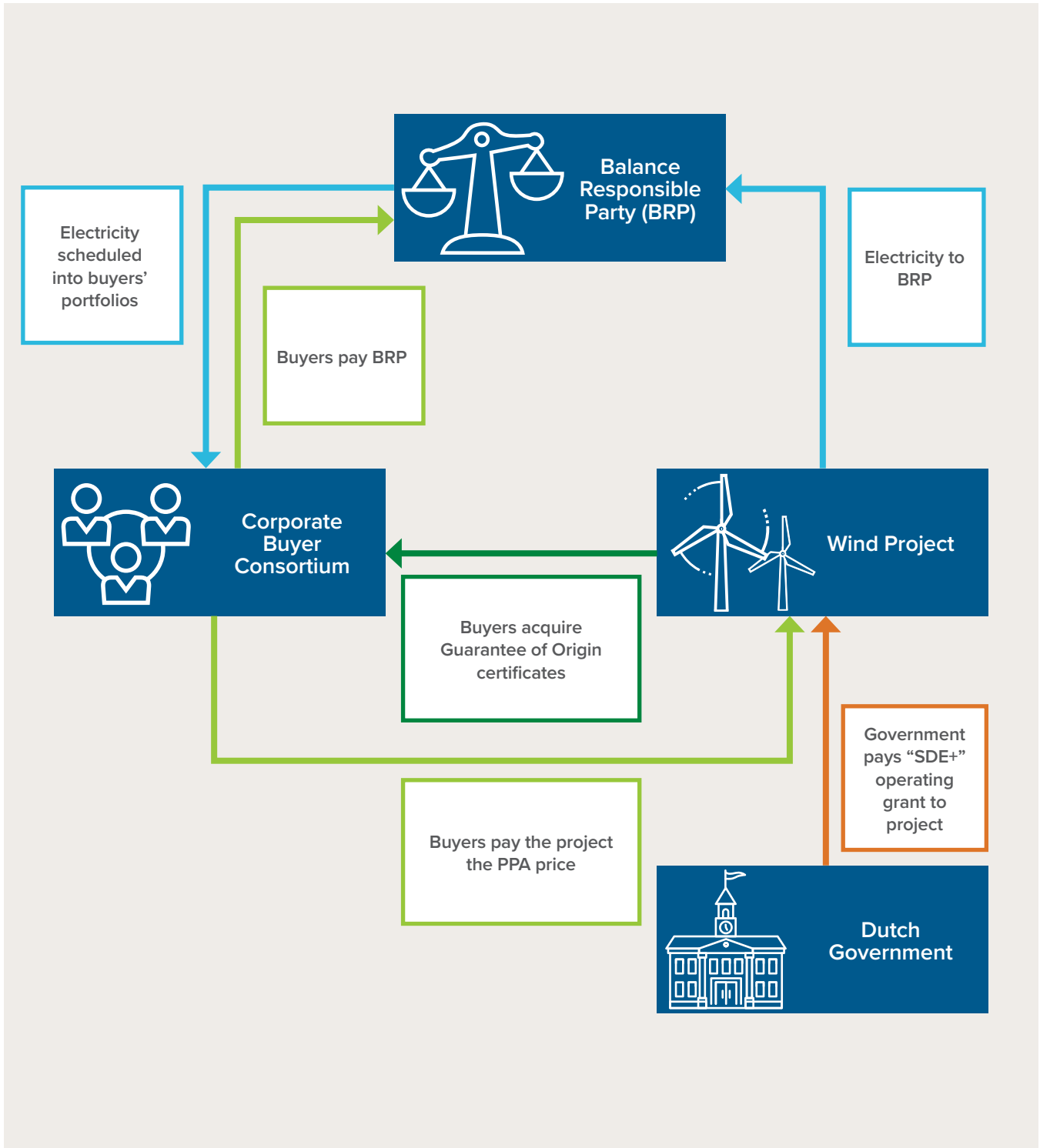
The Netherlands offers other incentives for renewable energy generation, including:⁵

- The Environmental Investment Allowance (*Milieu Investeringsaftrek*) scheme, not applicable to projects receiving SDE+, offering a tax refund;
- The Free Depreciation of Environmental Investments (*Vrije Afschrijving Milieu Investeringsen*), providing voluntary depreciation; and
- The Green Funds Scheme, providing tax incentives to enable individuals to invest in projects that benefit the environment.

CORPORATE PPA STRUCTURE

In the Netherlands, nonutility buyers can sign long-term PPAs with renewable generation projects, with delivery of the electricity produced into their energy portfolios. The deal structure presented below is based on the deals AkzoNobel, DSM, Google, and Philips signed with Windpark Krammer and with Windpark Bouwdokken in 2016.

FIGURE 5
STRUCTURE OF THE PPAS SIGNED BY AKZONOBEL, DSM, GOOGLE, AND PHILIPS



Nonutility buyers of renewables can source electricity and GOs directly from projects that receive SDE+ support:

- **A new renewable project**, which secures project finance on revenues from PPA-driven payments and SDE+ revenue (see Government, below)
- **The nonutility buyer**, which signs a long-term procurement contract with the project for the purchase of the electricity produced and its renewable energy certificates
- **A balance responsible party**, a third party contracted to deliver energy into the buyer's portfolio and responsible for balancing services on behalf of the buyer
- **Government**, providing an SDE+ payment to the project for five, 12, or 15 years, depending on the renewable energy technology employed

NOTABLE NONUTILITY TRANSACTIONS IN THE NETHERLANDS

- Google, with a wind project at Delfzijl (62 MW), November 2014
- AkzoNobel, DSM, Google, and Philips, with Windpark Krammer (102 MW), October 2016
- AkzoNobel, DSM, Google, and Philips, with Windpark Bouwdokken (34 MW), December 2016

Photo courtesy Tijmen Keesmaat



¹ Deloitte (2016), European energy market reform – Country profile: Netherlands, <https://www2.deloitte.com/content/dam/Deloitte/global/Documents/Energy-and-Resources/gx-er-market-reform-netherlands.pdf>.

² DutchNews.nl (30 May 2017), "Dutch renewable energy use edges up to 5.9% in 2016," <http://www.dutchnews.nl/news/archives/2017/05/dutch-renewable-energy-use-edges-up-to-5-9-in-2016/>.

³ EKOenergy (Accessed: 31 August 2017), "Guarantees of Origin Making a Difference," <http://www.ekoenergy.org/guarantees-of-origin-making-a-difference/>.

⁴ Netherlands Enterprise Agency (2017), SDE+ Spring 2017, https://english.rvo.nl/sites/default/files/2017/03/170307_Brochure_SDE2017UK_def_0.pdf.

⁵ Lexology (Accessed: 31 August 2017), "CMS guide to electricity - The Netherlands," <https://www.lexology.com/library/detail.aspx?q=9a6f2952-13fc-4c3b-b6c0-11cd72d3e216>.



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