

International Solar Alliance Expert Training Course: Session 12

Corporate Solar PV Adoption

In partnership with the Clean Energy Solutions Center (CESC)

Toby D. Couture

March 2019

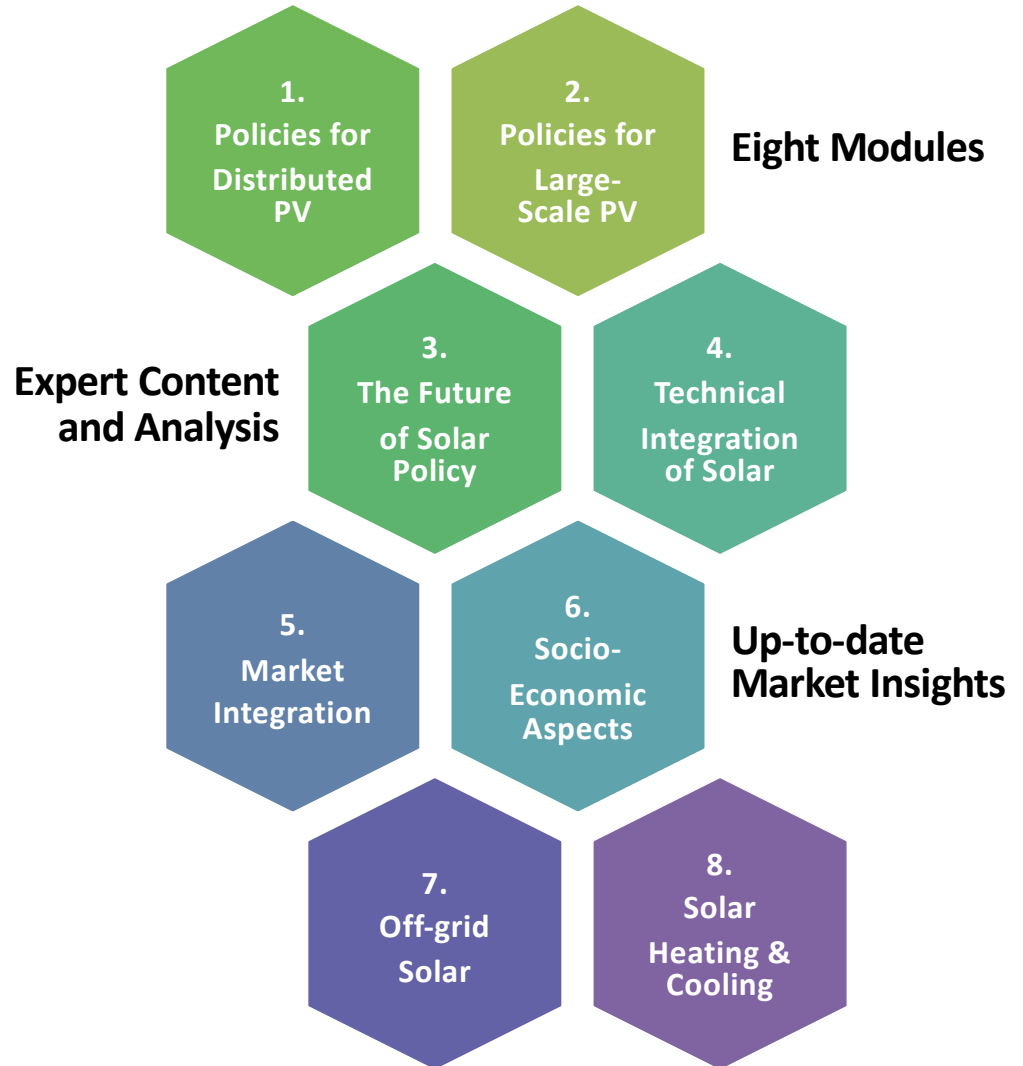
Supporters of this Expert Training Series



ASSISTING COUNTRIES WITH CLEAN ENERGY POLICY

Overview of Training Course Modules

This Training is part of Module 2, and focuses on the issue of **Corporate Solar PV Adoption**



Overview of the Presentation

- 1. Introduction: Learning Objective**
- 2. Main body of presentation**
- 3. Concluding Remarks**
- 4. Further Reading**
- 5. Knowledge Check: Multiple-Choice Questions**

1. Introduction: Learning Objective

Learning Objectives

- ❖ **Understand the rise of corporate PPAs**
- ❖ **Understand how they work, and what the main drivers behind them are**
- ❖ **Understand where corporate PPAs are currently being used in jurisdictions around the world**
- ❖ **Understand the advantages and challenges of corporate PPAs**

2. Corporate Solar PV Adoption

Introduction

- A growing share of renewable energy investments globally are being bought by large companies, or purchased to meet company electricity needs
- Hundreds of companies are in the process of buying renewable energy in a range of different ways
- 4.81GW of deals were announced in the U.S. alone in the first 10 months of 2018
- Particularly common for tech companies and others with large power demand (e.g. data centers, large-scale retail operation, overseas manufacturing projects)

Corporate sourcing of RE

- Corporate source of solar PV allows companies to meet their environmental and CSR commitments by directly purchasing renewable energy
- Enables corporates to obtain cleaner power supply than that offered by the prevailing electricity mix in the country or jurisdiction where their operations are based
- In many cases, such PPAs can offer valuable cost savings over traditional utility purchases: put differently, due to rapid and ongoing cost declines, **RE technologies like solar and wind are starting to undercut traditional utilities on price**

Self-consumption remains the largest model

However, the corporate PPA model is growing rapidly worldwide

1 Unbundled energy attribute certificates (EACs)

1

A company purchases attribute certificates of renewable energy separately "unbundled" from its electricity. Examples of certificate systems are guarantees of origin (GOs) and renewable energy certificates (RECs).



2 Power Purchase Agreements (PPAs)

2

A company enters into a contract with an independent power producer, a utility or a financier and commits to purchasing a specific amount of renewable electricity, or the output from a specific asset, at an agreed price and for an agreed period of time.



3 Renewable energy offerings from utilities or electric suppliers

3

A company purchases renewable electricity from its utility either through green premium products or through a tailored renewable electricity contract, such as a green tariff programme.



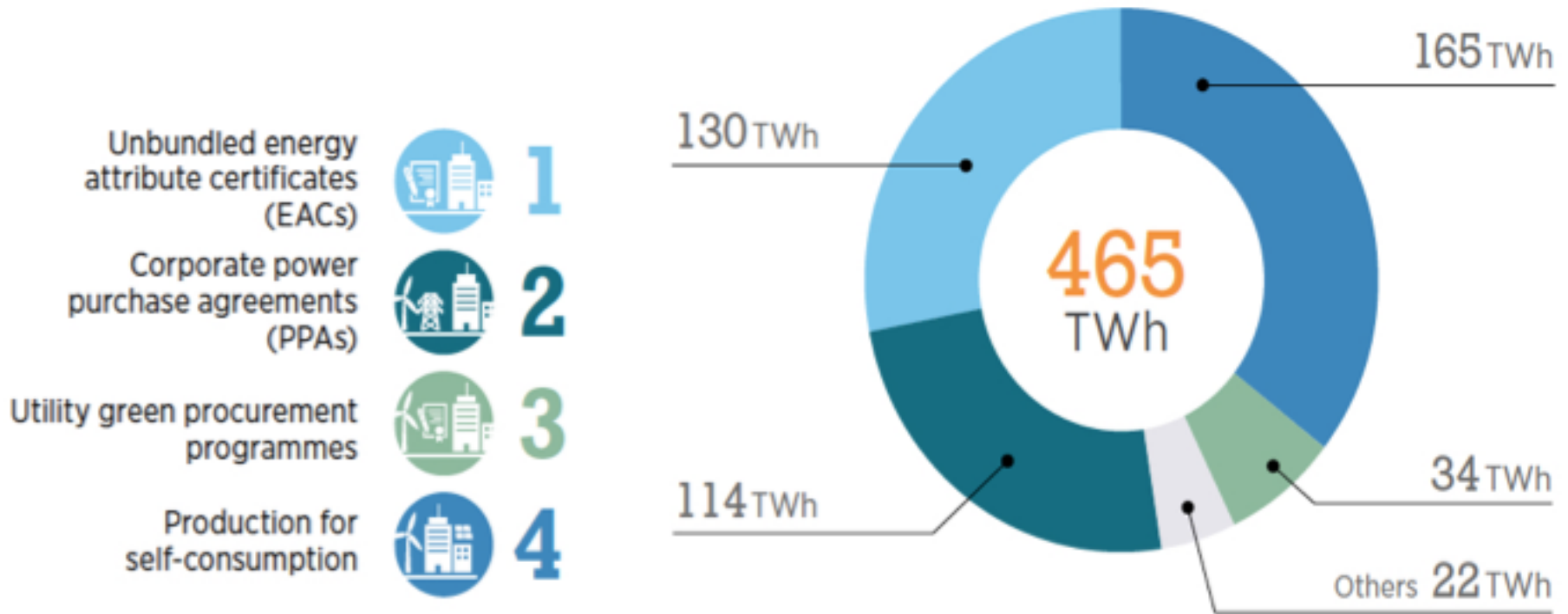
4 Production for self-consumption

4

A company invests in its own renewable energy systems, on-site or off-site, to produce electricity primarily for self-consumption.

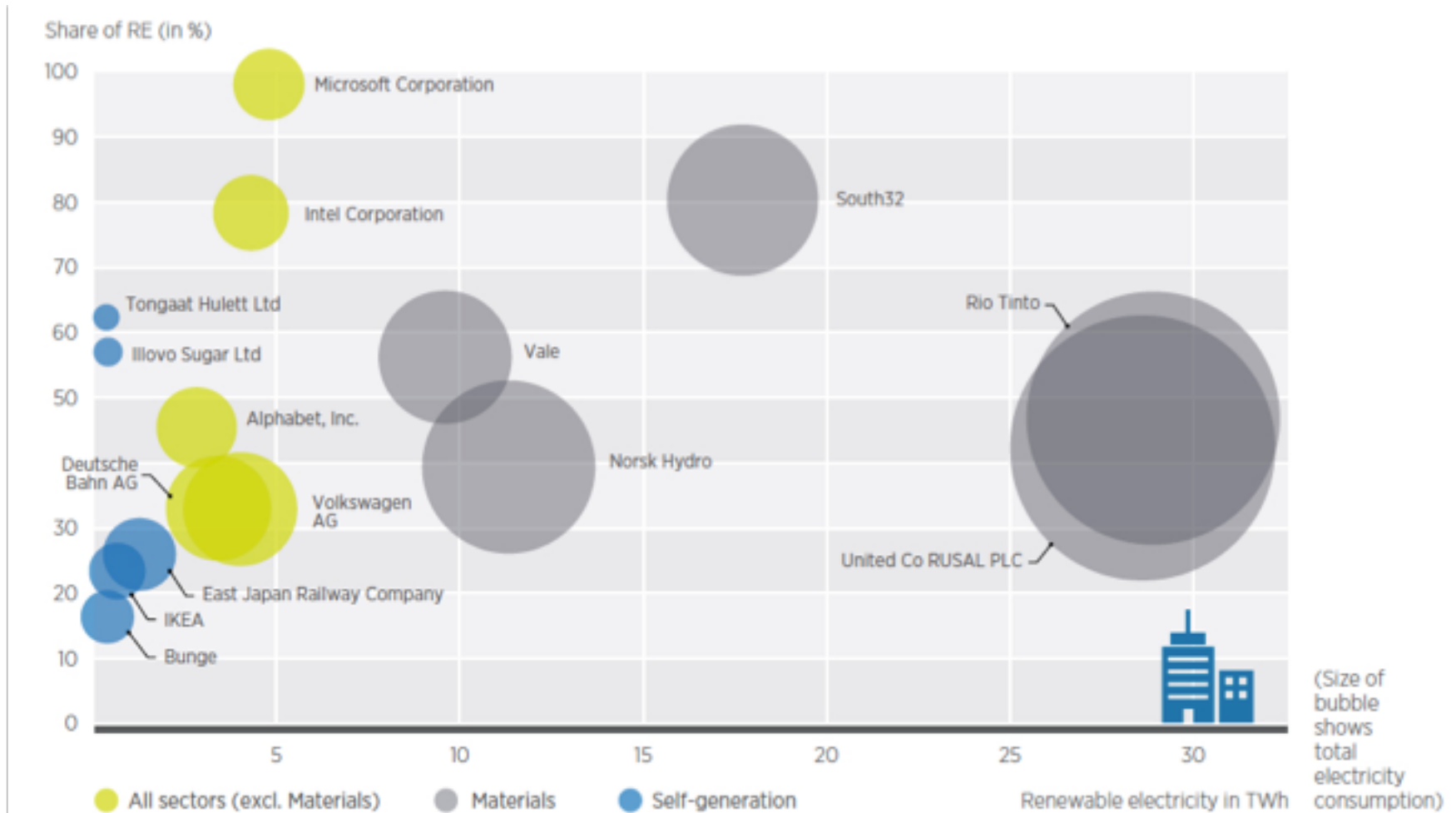


111 Companies worldwide already meet 85-100% of their power needs with RE



https://irena.org/-/media/Files/IRENA/Agency/Publication/2018/May/IRENA_Corporate_sourcing_2018.pdf

Main companies active in corporate sourcing



https://irena.org/-/media/Files/IRENA/Agency/Publication/2018/May/IRENA_Corporate_sourcing_2018.pdf

Q: Is this a big deal?

A: Yes!

Companies in the commercial and industrial sectors represent an estimated **2/3 of total global electricity consumption**

https://irena.org/-/media/Files/IRENA/Agency/Publication/2018/May/IRENA_Corporate_sourcing_2018.pdf

Corporate sourcing of RE

Corporate sourcing of RE refers to renewable energy purchased through one of four main options:

1. Directly from a **third party supplier** (IPP), via a real PPA (incl. electrons!) or a virtual one (w/o electrons, i.e. financial)
2. Through the output of an **onsite RE project** (i.e. self-consumption or own-use)
3. Through **the utility**
4. Through the **purchase of RE attributes** (e.g. EACs, RECs, TGCs)

Main Drivers Corporate PPAs

Main priority in most cases: Reducing power costs!

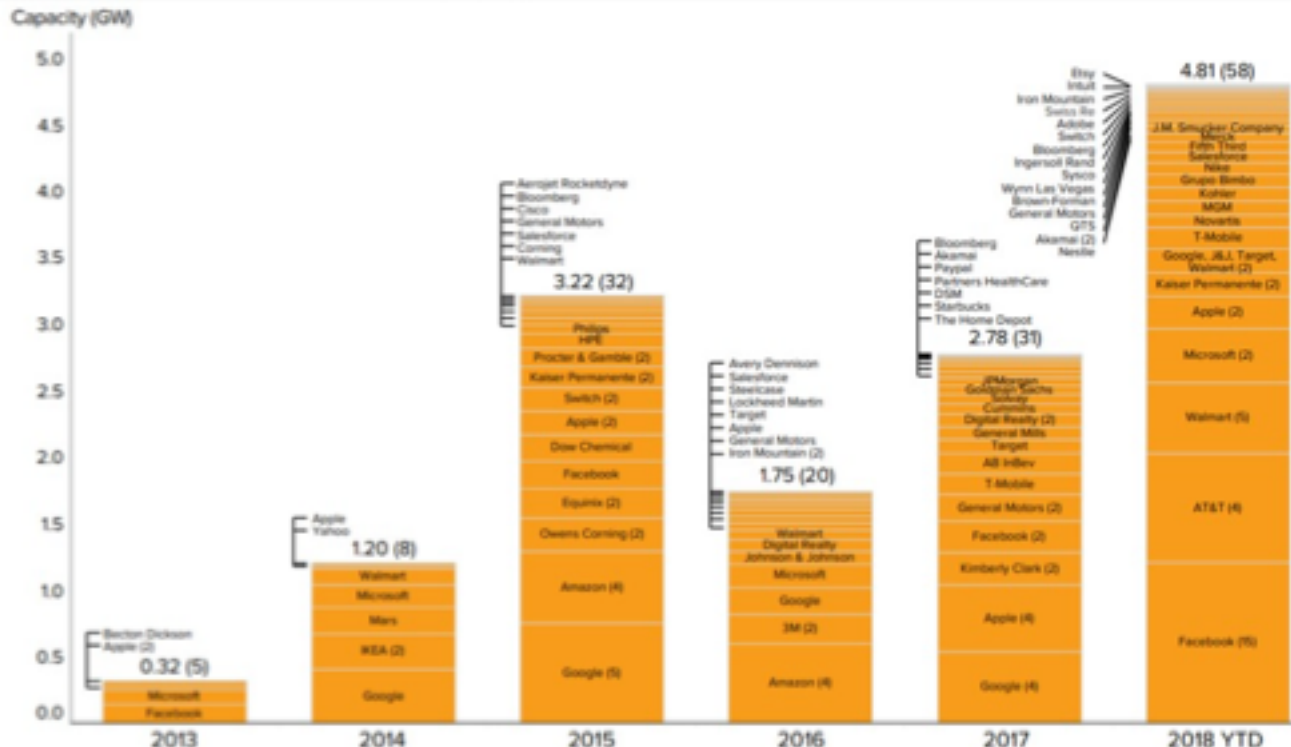
Secondary priorities:

- Meeting firm-specific carbon reduction targets
- Improving environmental performance
- Delivering on Environmental and Social Governance (ESG) goals
- Enables a company to invest in renewable energy off-site (i.e. not on their own land) as well as off-balance sheet
- May provide tax, accounting, or other advantages
- Enables companies to invest directly in renewable energy without needing to go through their utility
- Branding, etc.

The number of corporate deals is growing



2018 YTD Deal Tracker



As of October 16, 2018. Publicly announced contracted capacity of corporate Power Purchase Agreements, Green Power Purchases, Green Tariffs, and Outright Project Ownership in the US, 2013 – 2018 YTD. Excludes on-site generation (e.g., rooftop solar PV) and deals with operating plants. (F) indicates number of deals each year by individual companies. Copyright 2018 by Rocky Mountain Institute

<https://www.utilitydive.com/news/virtual-contracts-drive-a-boom-in-corporate-renewables-procurement/540181/>

3. Understanding Corporate Solar PV Adoption

Overview of Corporate PPAs

1. **Physical or “Classic” PPA:** direct power purchase agreement, similar to those typically signed by utilities with independent power producers
2. **Virtual Power Purchase Agreement:** financial contract through which the electricity is only nominally purchased by the company, but is delivered over the utility’s wires
3. **Onsite “Prosumer” Model:** Project is located on or near the facility and serves onsite load directly: prosumer model

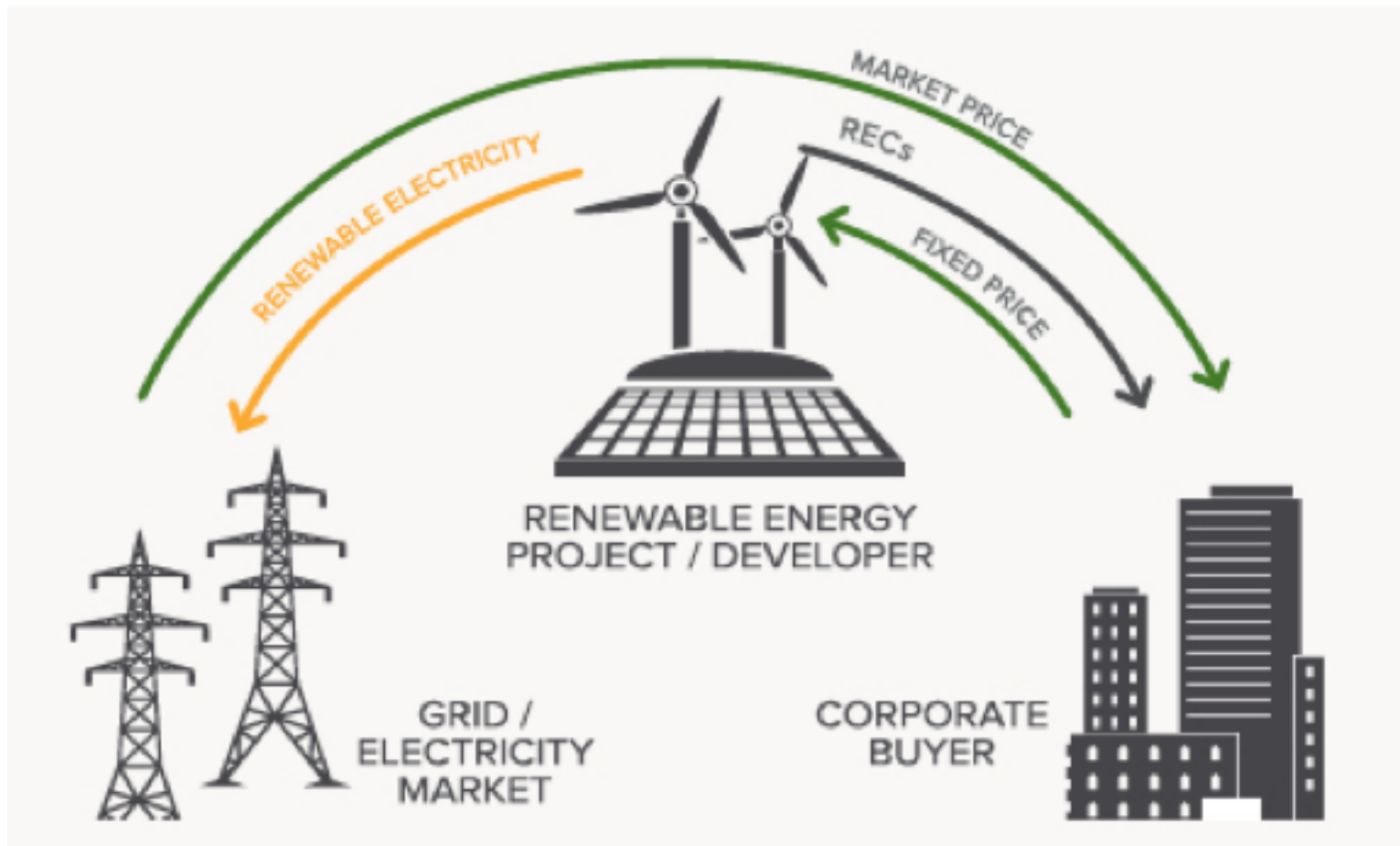
Can also involve simply the purchase of Renewable Energy Certificates produced by eligible RE facilities

Overview of Corporate PPAs

Classic PPA: typically 5 to 25-year offtake contracts signed for all of a project's output. Standard PPAs involve the actual exchange of electricity between a buyer and a seller.

- Direct PPA contract with a specific wind or solar project
- Contract enables developer to obtain financing (typically a mix of debt and equity)
- Corporate buyer becomes the sole off-taker
- In competitive electricity markets, the corporate buyer pays a fixed price in exchange for the spot market revenue derived from electricity sales
- Buyer typically receives RECs
- Contract duration ranges from 5 – 25 years

Overview of Corporate PPAs



<https://www.utilitydive.com/news/virtual-contracts-drive-a-boom-in-corporate-renewables-procurement/540181/>

What is a virtual PPA (synthetic PPA)?

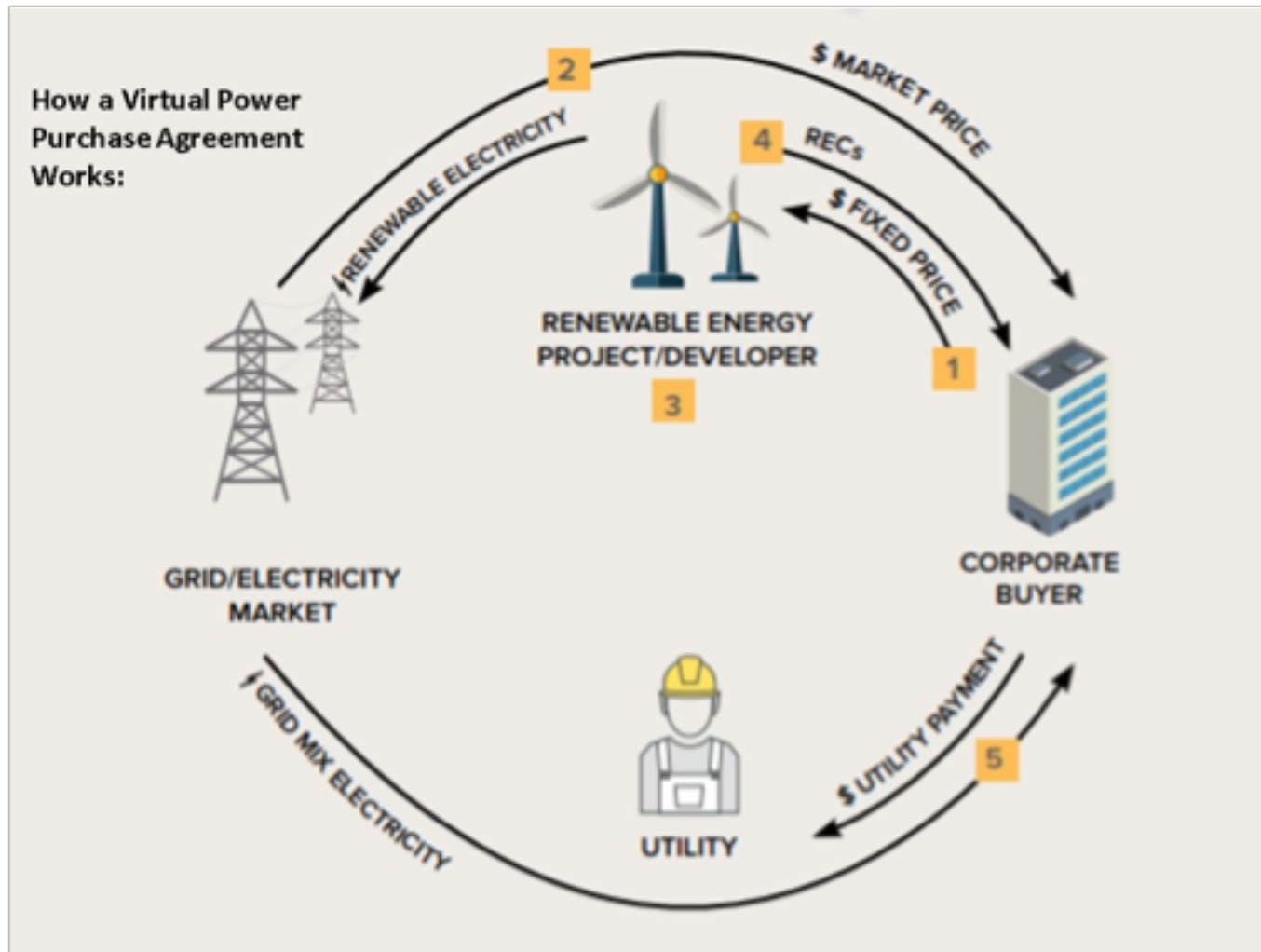
Virtual or Synthetic PPAs: financial instruments that can help create a bankable investment without relying on the actual exchange of electricity.

Like standard PPAs, synthetic PPAs involve a clear price (or price schedule) and a clear duration

Often shorter than “real” PPAs (e.g. 5-10 years), with potential merchant risk thereafter

Virtual PPAs involve a financial contract based on the purchase of RECs (or EACs) (not electricity)

What is a virtual or synthetic PPA?



<https://www.utilitydive.com/news/virtual-contracts-drive-a-boom-in-corporate-renewables-procurement/540181/>

What is a virtual or synthetic PPA?



The renewable energy generator sells its electricity in the spot market and then settles the price (based on the difference between the variable market price and the strike price) with the company who receives the associated EACs.

https://irena.org/-/media/Files/IRENA/Agency/Publication/2018/May/IRENA_Corporate_sourcing_2018.pdf

What is a virtual PPA?

Virtual PPAs enable the buyer more flexibility:

- A company's load may not be sufficiently high 7-days/week, 365 days/year to buy all the power themselves
- Unclear whether the company will exist as long as the wind or solar project
- Virtual PPAs offer more siting flexibility
- May offer additional accounting and tax advantages

<https://www.utilitydive.com/news/virtual-contracts-drive-a-boom-in-corporate-renewables-procurement/540181/>

What is an aggregated corporate PPA?

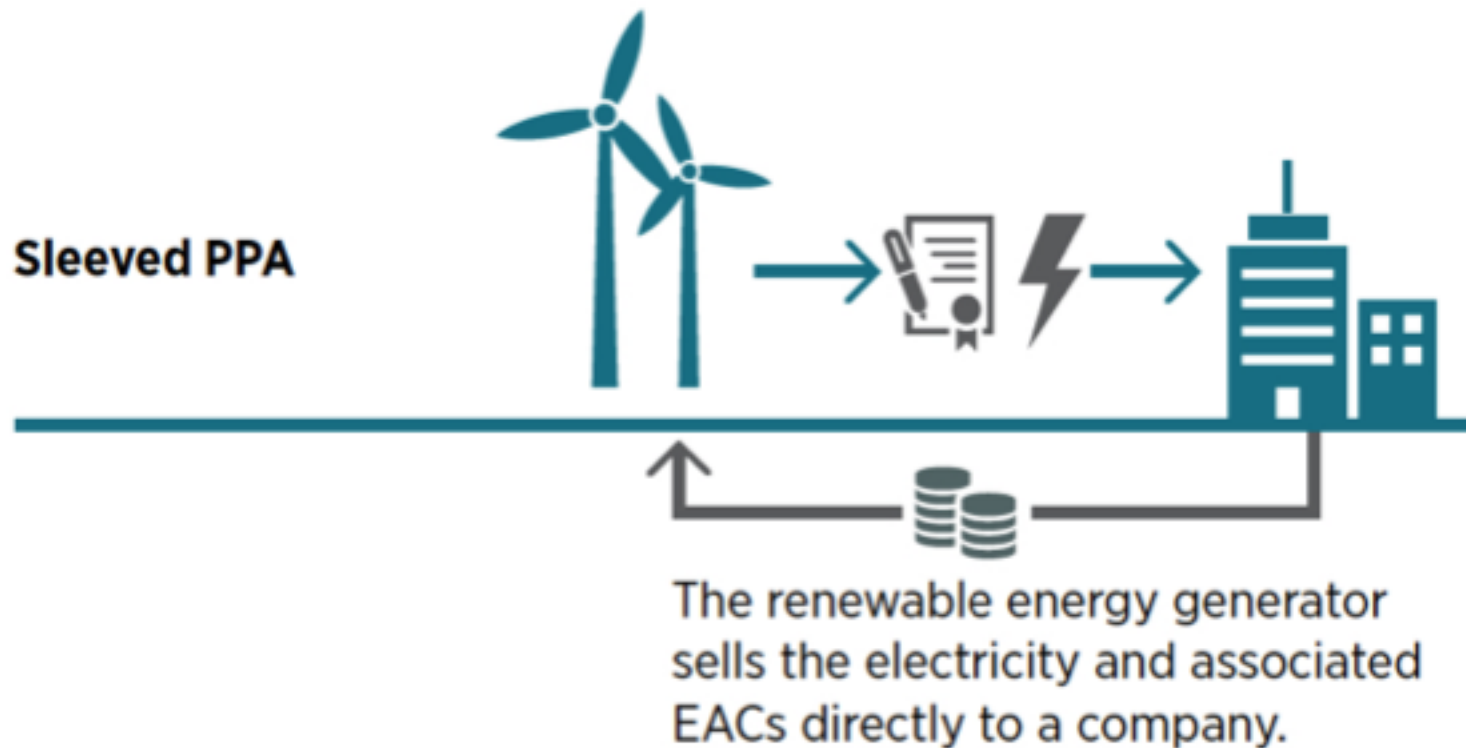
In some cases, corporates can group together to collectively become off-takers of a particular RE project:

- Provides the developer more security by diversifying (mitigating) their off-taker risk
- Consortium model provides better economies of scale, enabling individual companies to secure a lower per-kWh price
- Also provides improved diversification and risk reduction benefits

https://www.dsm.com/content/dam/dsm/cworld/en_US/documents/2017-12-07-brc-the-dutch-wind-consortium-case-study.pdf

“Sleeved” PPAs

Another variation is the so-called “sleeved PPA”: power is sold to a company via the utility’s wires



https://irena.org/-/media/Files/IRENA/Agency/Publication/2018/May/IRENA_Corporate_sourcing_2018.pdf

Trends in Corporate Sourcing

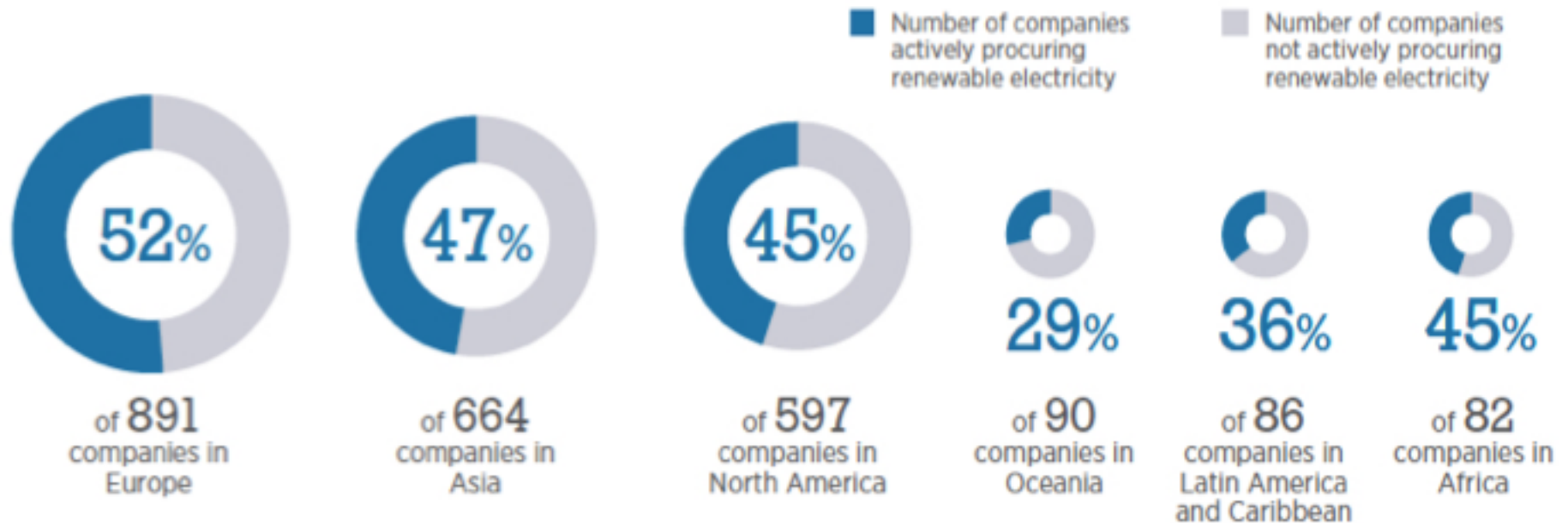
- The corporate PPA market is spreading from the U.S. to markets around the world
- Physical PPAs becoming less common: Virtual PPAs becoming more common
- In the U.S., *“unbundled RECs, which have been the workhorse of the voluntary market for a long time, are slowly being overtaken by direct PPAs.”*
- The market is evolving toward more corporate buyers wanting to directly invest in renewable energy projects, not only purchase the RECs or EACs

<https://www.utilitydive.com/news/virtual-contracts-drive-a-boom-in-corporate-renewables-procurement/540181/>

4. Examples Around the World

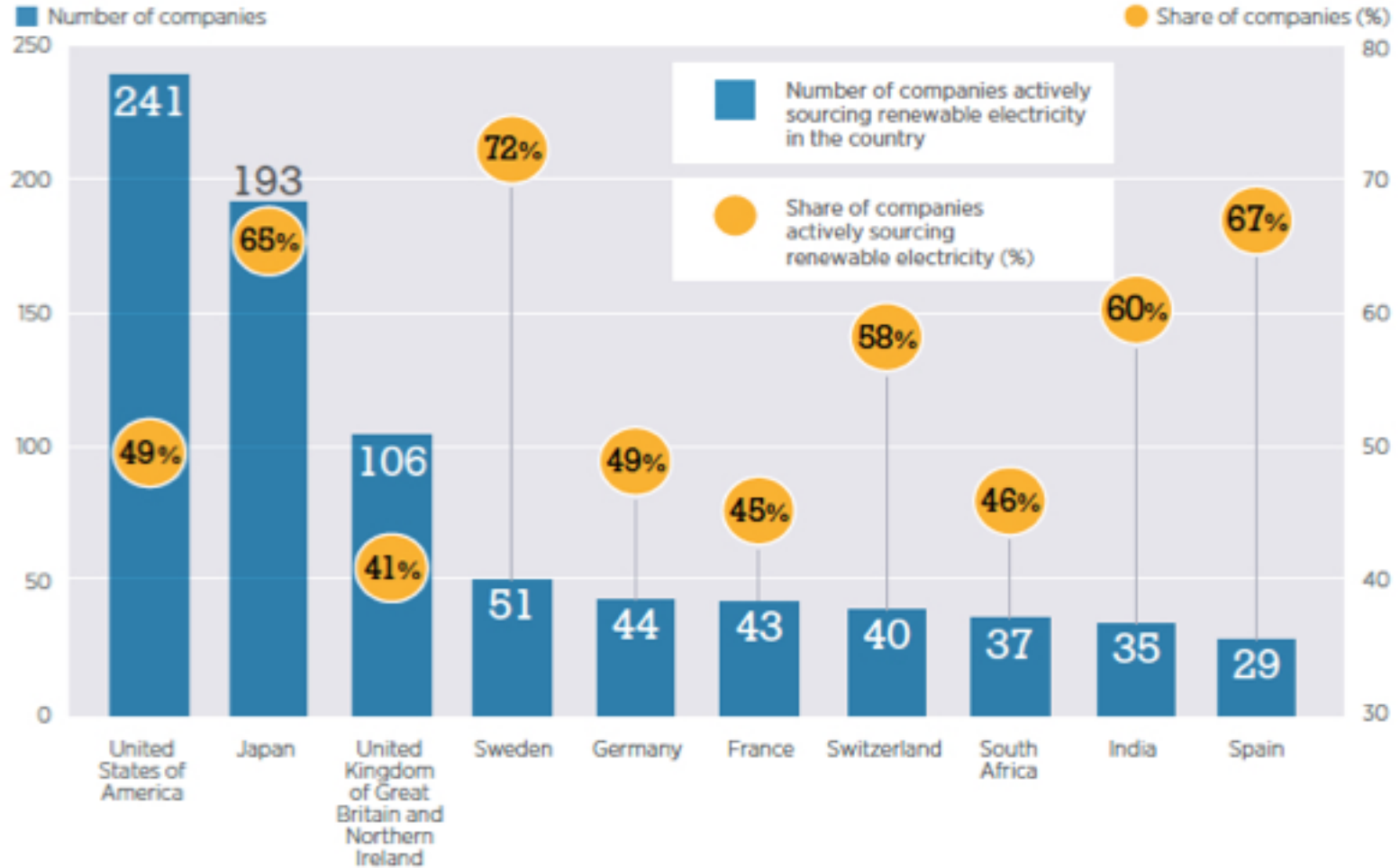
Corporate Sourcing of RE Worldwide

Although Europe remains the largest market in 2018, this is likely to change as Asia grows



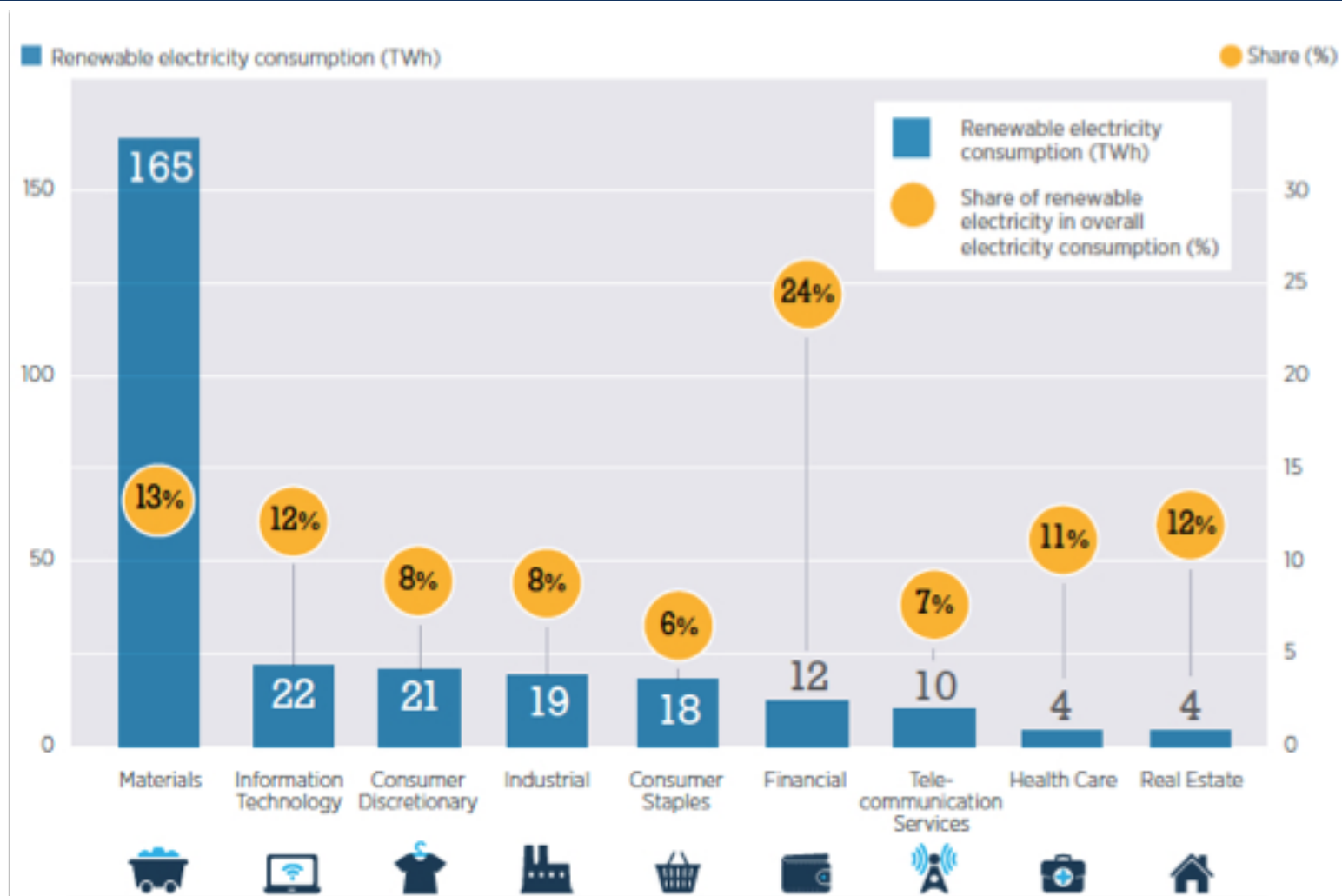
https://irena.org/-/media/Files/IRENA/Agency/Publication/2018/May/IRENA_Corporate_sourcing_2018.pdf

Corporate Sourcing of RE Worldwide



https://irena.org/-/media/Files/IRENA/Agency/Publication/2018/May/IRENA_Corporate_sourcing_2018.pdf

Corporate Sourcing by Sector



https://irena.org/-/media/Files/IRENA/Agency/Publication/2018/May/IRENA_Corporate_sourcing_2018.pdf

Corporate Sourcing in Developing Countries

- **Corporate sourcing is starting to spread globally:**
 - **In Brazil**, retail prices increased suddenly by 45% in 2015
 - **In Argentina**, companies now face renewable energy quotas, rising from 8% in 2015 to 25% in 2025
 - **In Mexico**, companies are engaging in more corporate PPAs, signing 3.4GW between 2008 – 17
 - **In Chile**, corporate PPAs are proving popular with copper mining companies
 - **In Vietnam**, major clothing manufacturers are starting to sign large solar PPAs

Corporate Sourcing in Developing Countries

- **In other parts of the world, similar developments are emerging:**
 - **In India**, rising retail prices are making corporate PPAs more attractive
 - **In Jordan**, a large cement company signed a 15MW PPA
 - **In Egypt**, a large agricultural company signed a corporate PPA for 53MW of solar PV
 - **In Burkina Faso**, mining companies recently signed a PPA for supply from a 15MW solar PV project
 - **In Namibia**, a large cement company signed a 5MW solar PPA

5. Concluding Remarks

Concluding Remarks

- Corporate sourcing of renewables can play a major role in accelerating the global energy transition
- Since companies represent an estimated 2/3 of global electricity consumption, what companies do (i.e. what kinds of electricity they purchase, from whom, and how) matters quite a lot
- The key question emerging now, as renewables continue to decline in cost and offer cost savings beyond what utilities can offer, is: **how can company executives and managers justify NOT procuring renewables?**

Concluding Remarks

- Put differently, if corporate PPAs can provide proven cost savings for companies, do executives have a ***fiduciary responsibility*** to start corporate sourcing of renewables?
- As the economics continue to shift in favor of solar, we could be seeing a major wave of corporate renewables deals sweeping the world in the years ahead

5. Further Reading

Further Reading

- IRENA 2018. Corporate Sourcing of Renewables. https://irena.org/-/media/Files/IRENA/Agency/Publication/2018/May/IRENA_Corporate_sourcing_2018.pdf
- RMI 2018. Corporate Sourcing in China: <https://www.rmi-china.com/static/upfile/news/nfiles/201803221612331288.pdf>
- Baker McKenzie (2018). The Rise of Corporate PPAs: 2.0. Available at: https://www.bakermckenzie.com/-/media/files/insight/publications/2018/07/fc_emi_riseofcorporatppas_jul18.pdf?la=en
- O'Shaughnessy et al. (2017). Status and Trends in the U.S. Voluntary Green Power Market. NREL. Available at: <https://www.nrel.gov/docs/fv18osti/70174.pdf>

Thank you for your time!



ASSISTING COUNTRIES WITH CLEAN ENERGY POLICY

6. Knowledge Checkpoint: Multiple Choice Questions