再生可能エネルギーのコストと調達方法

RE100

黒﨑　美穂

July 28, 2021

BloombergNEF

ローカルとグローバルの両方の観点から

250

BNEF professionals in 17 locations*

* Part of the Bloomberg LP network of 19,000 employees in 176 locations.

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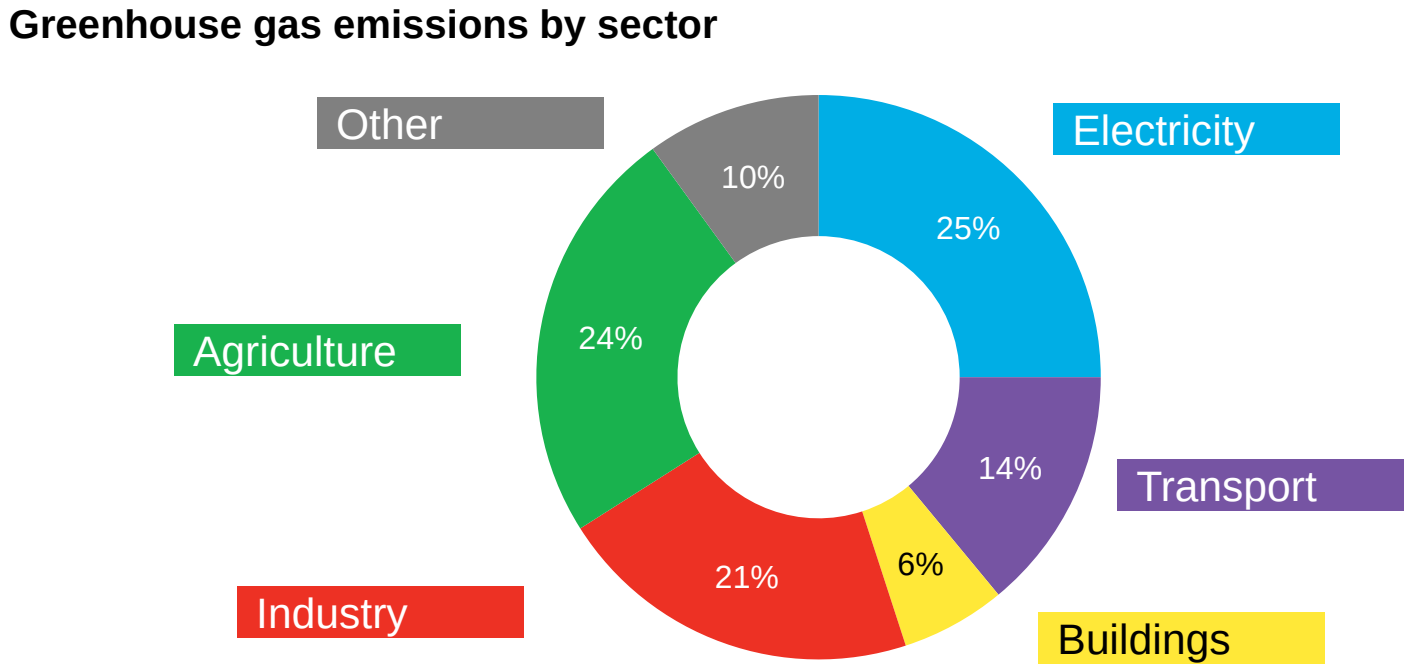
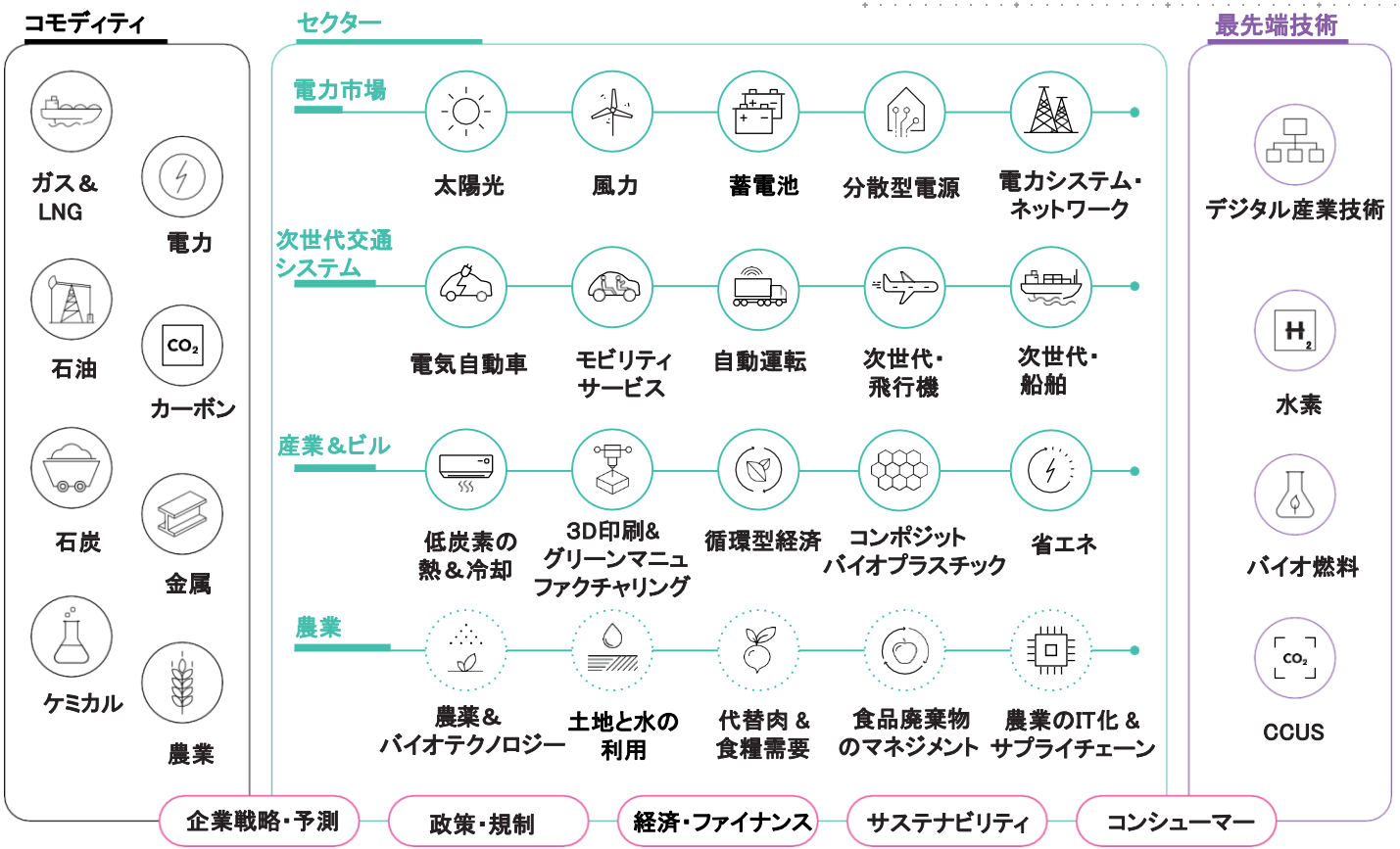
世界の温室効果ガスセクター別内訳



Source: International Energy Agency

BNEF coverage

Strategies for a cleaner, more competitive future



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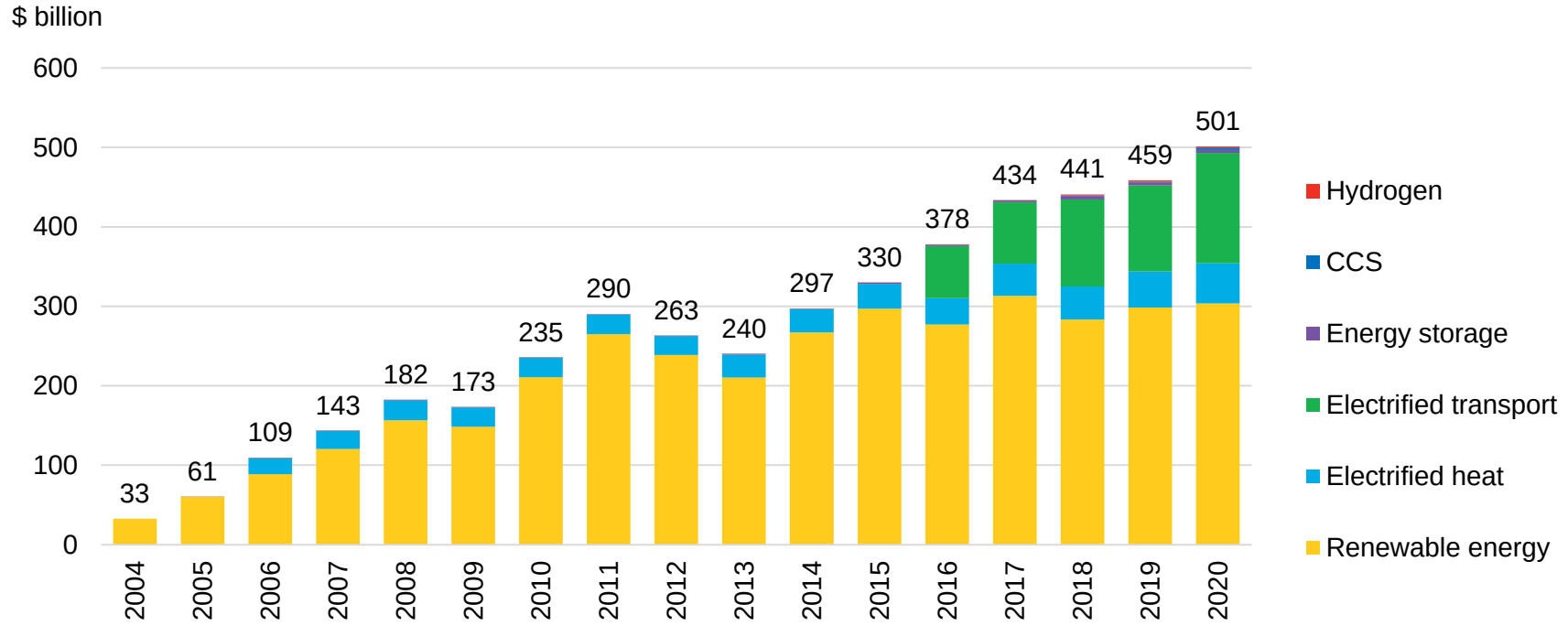
再エネ市場動向

脱炭素技術への投資は2020年、$500bnを超える



Source: BloombergNEF

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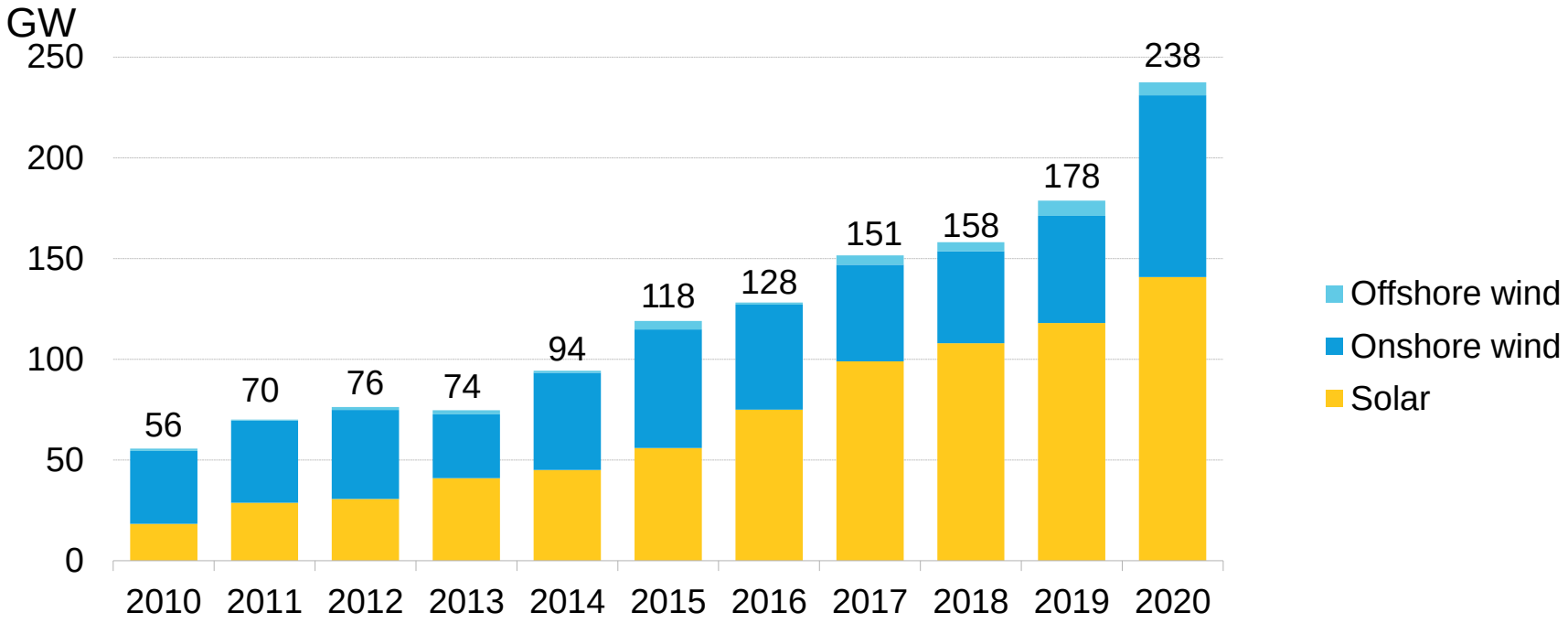
2020年の太陽光と風力新規導入量が238GWと記録更新



Source: BloombergNEF

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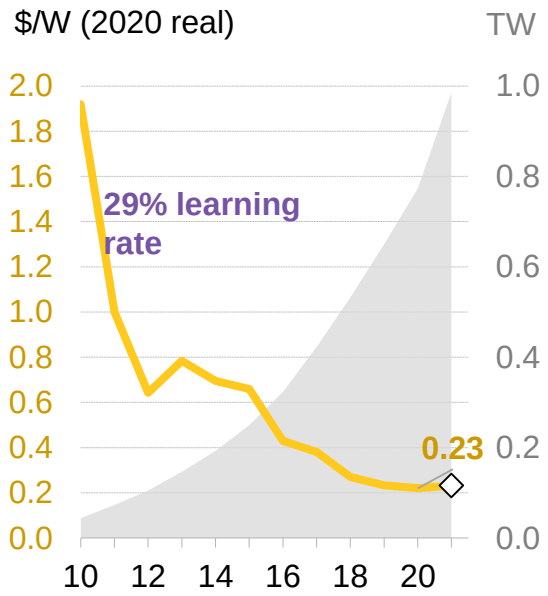
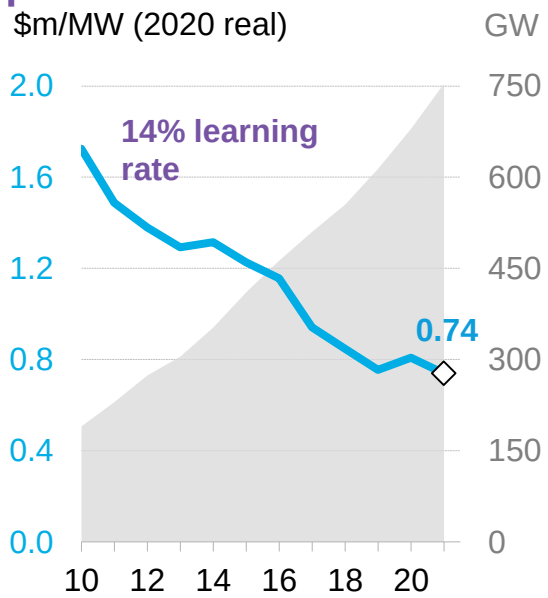
再エネ機器の価格下落

PV module price



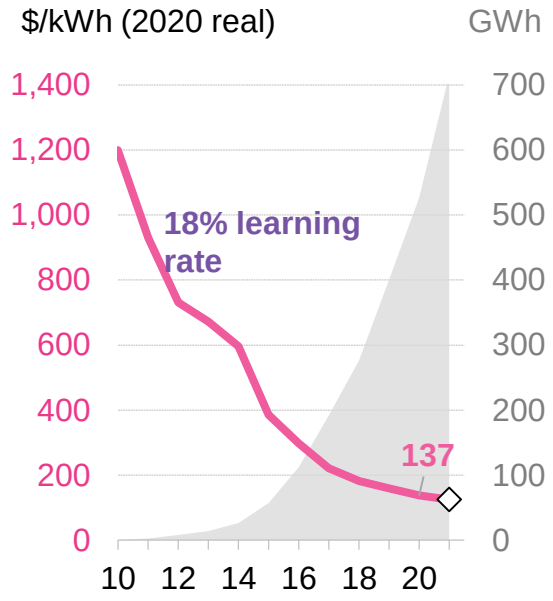
Source: BloombergNEF

Onshore wind turbine price



Source: BloombergNEF

Li-ion battery pack price



Source: BloombergNEF

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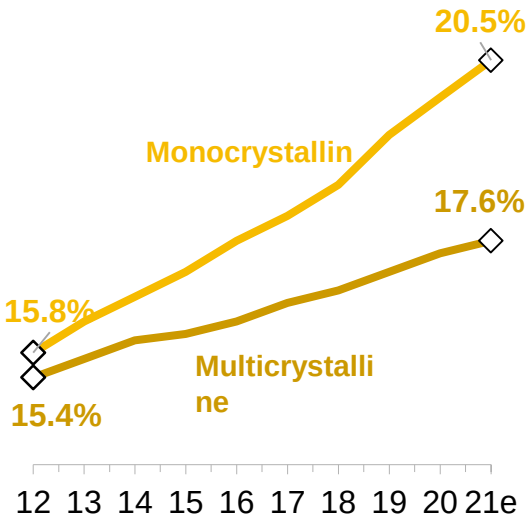
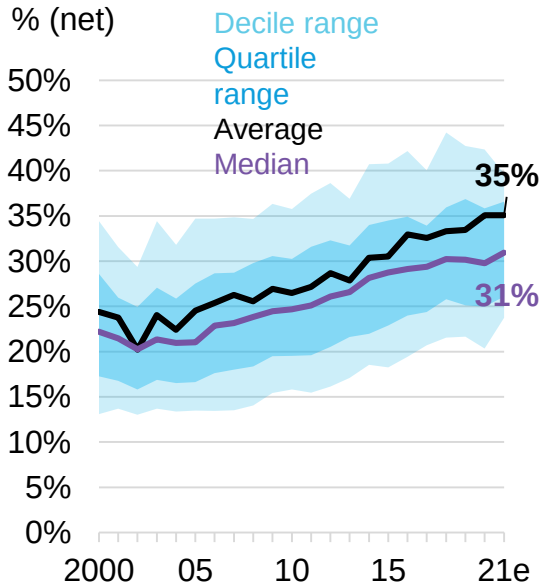
再エネ機器の効率性は向上

PV module efficiency



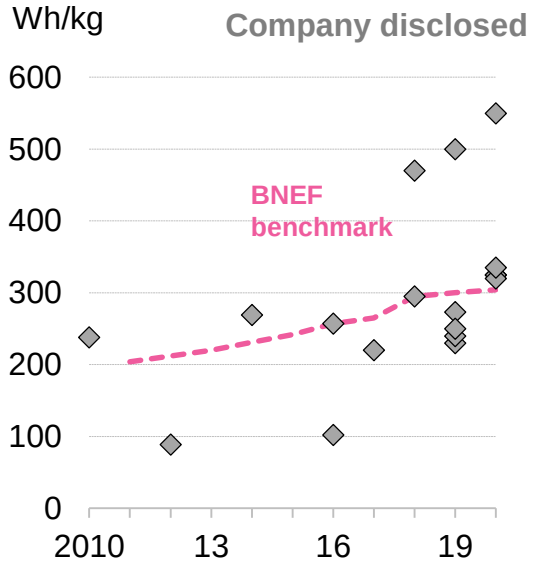
Source: BloombergNEF

Onshore wind capacity factors



Source: BloombergNEF

Cell energy density for EV



Source: BloombergNEF, public announcements, company interviews

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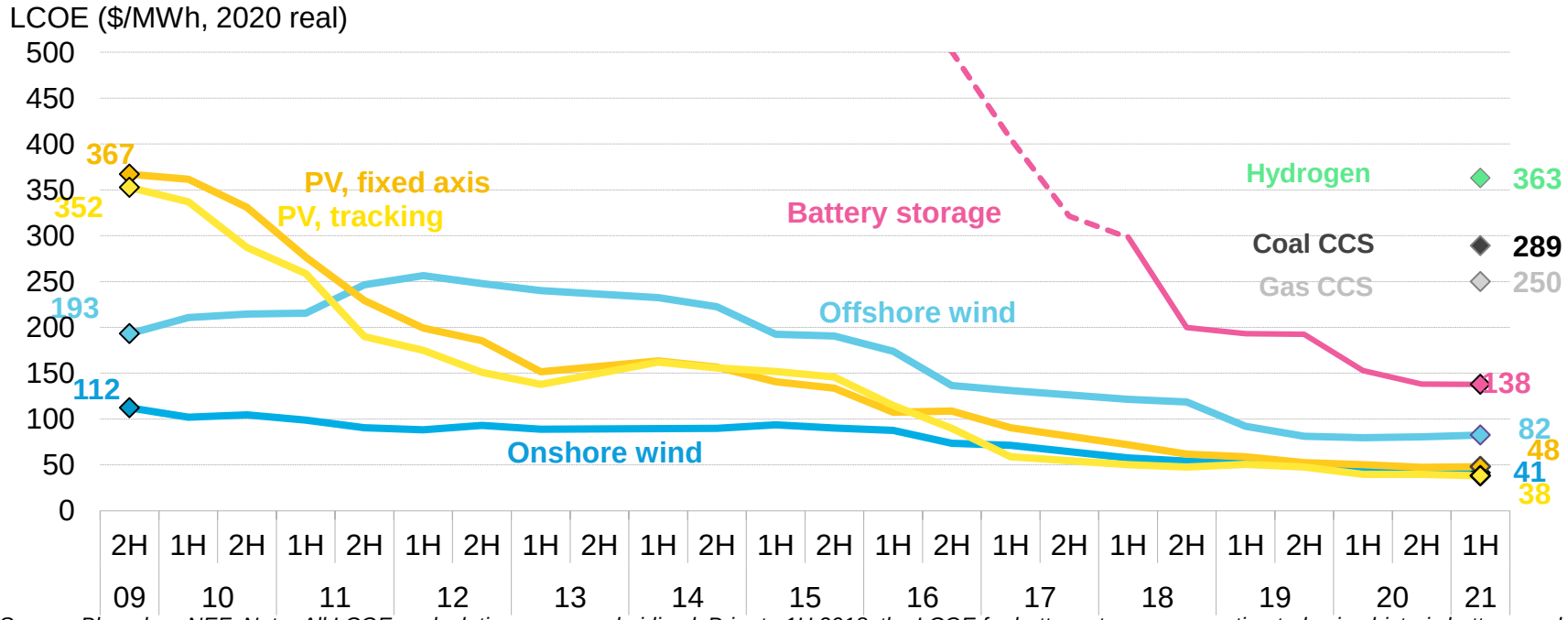
再生可能エネルギーの均等化発電コスト
グローバルで低減



Source: BloombergNEF. Note: All LCOEs calculations are unsubsidized. Prior to 1H 2018, the LCOE for battery storage was estimated using historic battery pack prices, from 1H 2018 onwards it is based on project data.

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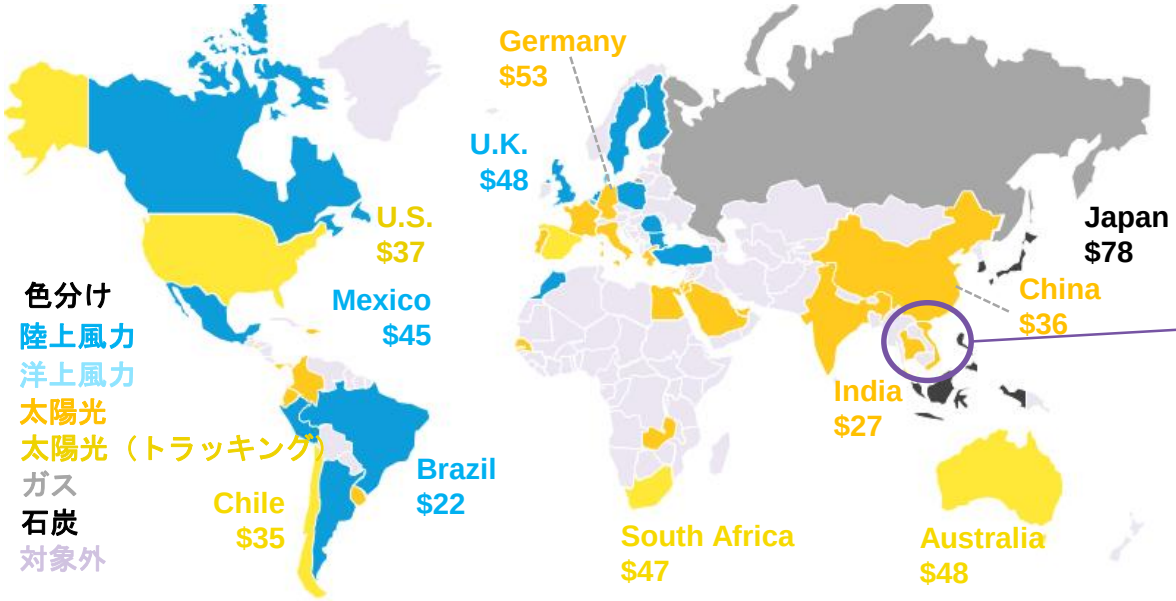
新設発電所にて再エネが最安の国は世界の3分の2に増加、再エネを経済的に選択する動きが広まる



- 日本は2025年以降に再エネが新設石炭より安価に
- タイは2020年、ベトナムは2021年に太陽光が最安に。半年前まで石炭最安
- その他東南アジア諸国も追随

Source: BloombergNEF. Note: The map shows the technology with the lowest LCOE for new-build plants in each country where BNEF has data. The dollar numbers denote the per MWh benchmark levelized cost of the cheapest technology. All LCOEs are in nominal terms. Calculations exclude subsidies, tax-credit or grid connection costs. CCGT is combined-cycle gas

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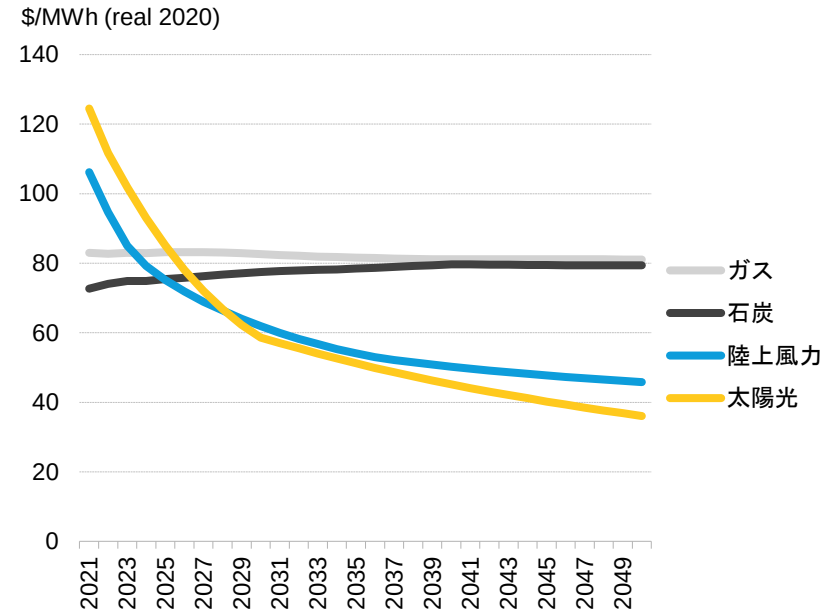
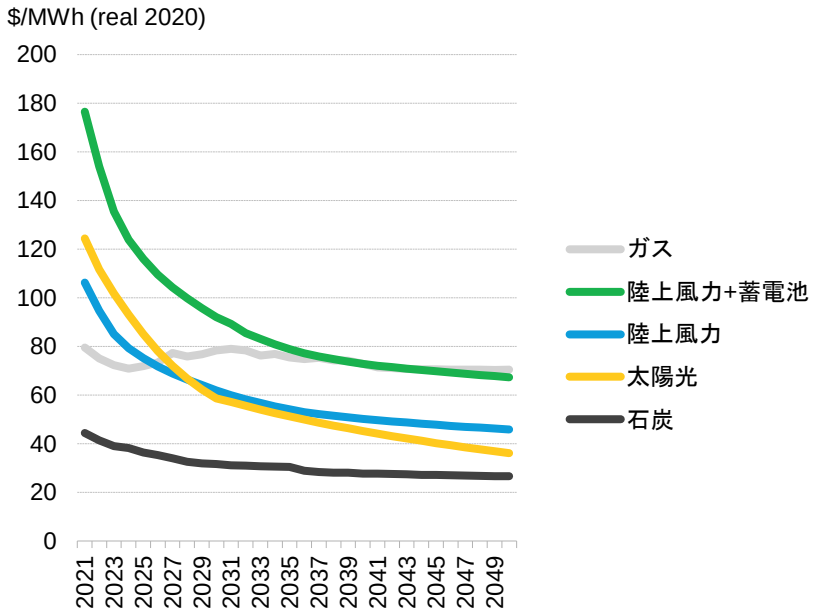
太陽光発電は新設ベースで2020年代後半に石炭より安価に、2050年まで既設石炭火力より安価にならない

新設再エネと新設火力



Source: BloombergNEF

新設再エネと既設火力



Source: BloombergNEF

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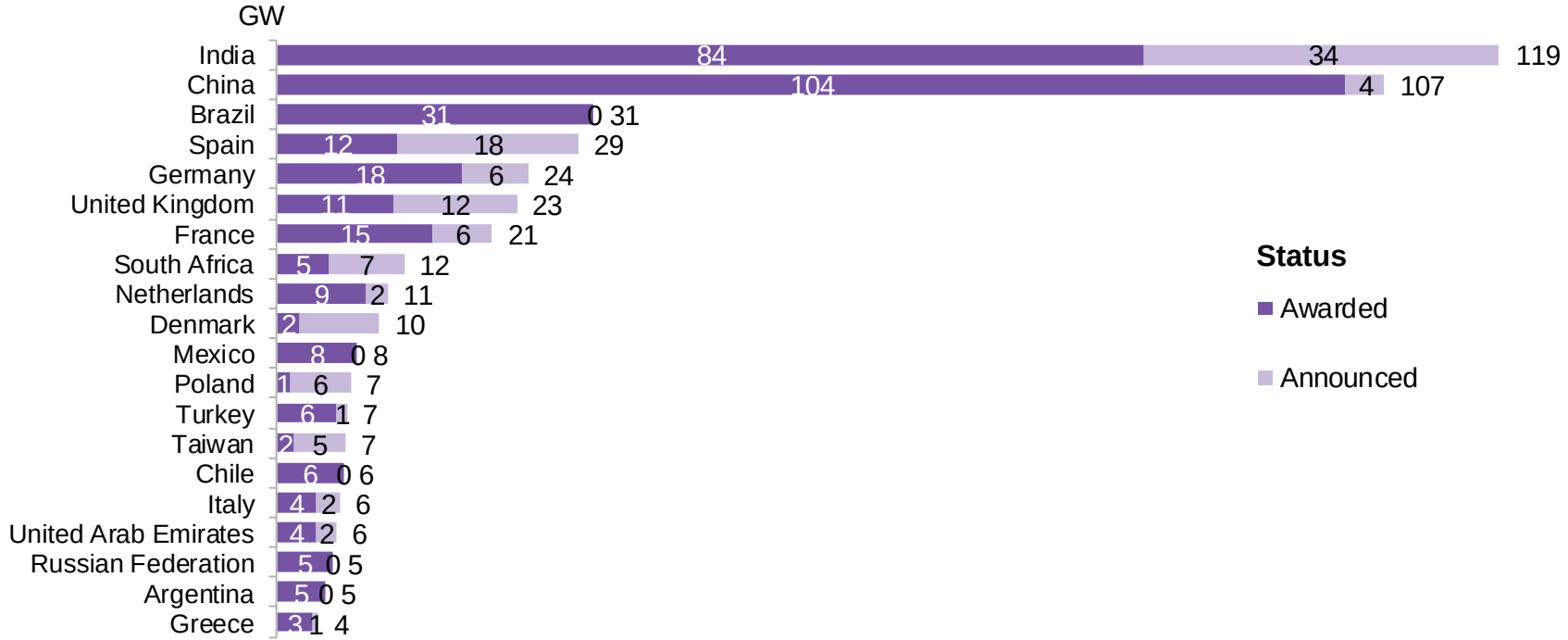
Countries with highest auctioned and announced renewables capacity



Source: BloombergNEF. Note: Figures are cumulative over 2003-20. Uses plant-level data for auctions where support is awarded for generation.

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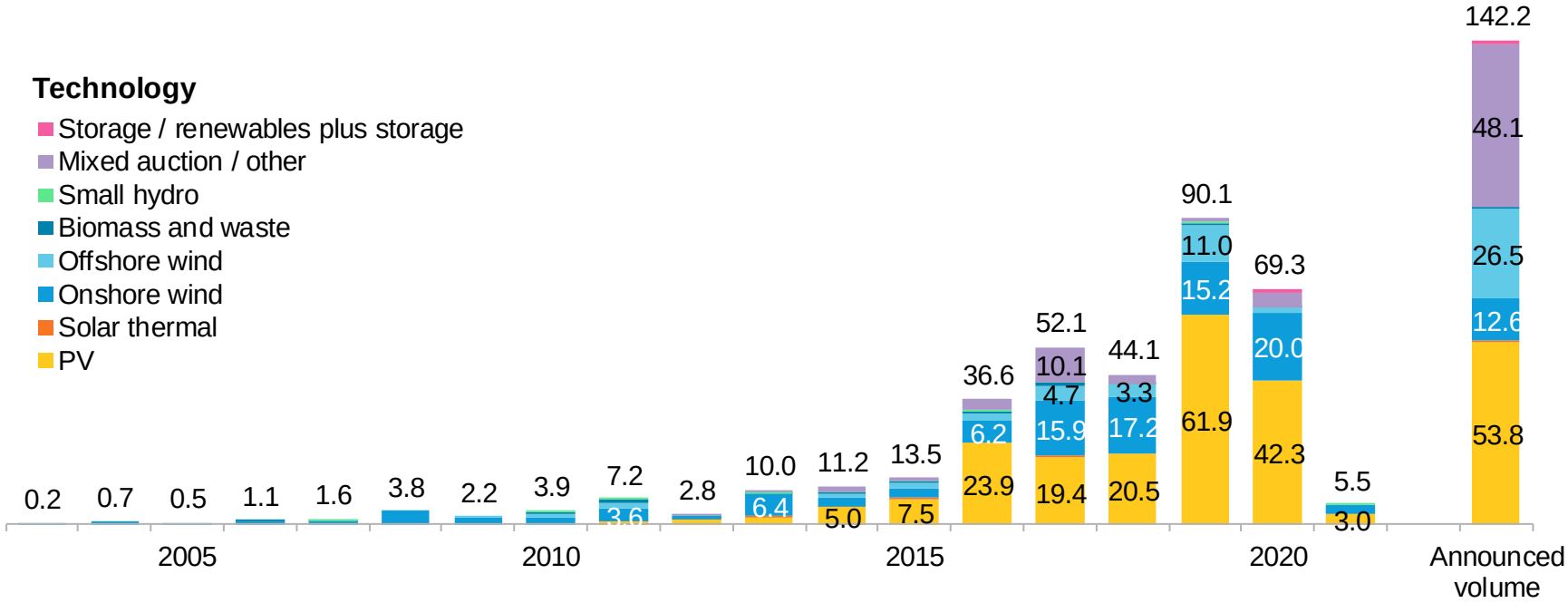
Annual auctioned and announced renewables capacity by technology

GW



Source: BloombergNEF. Note: Uses plant-level data for auctions where support is awarded for generation.

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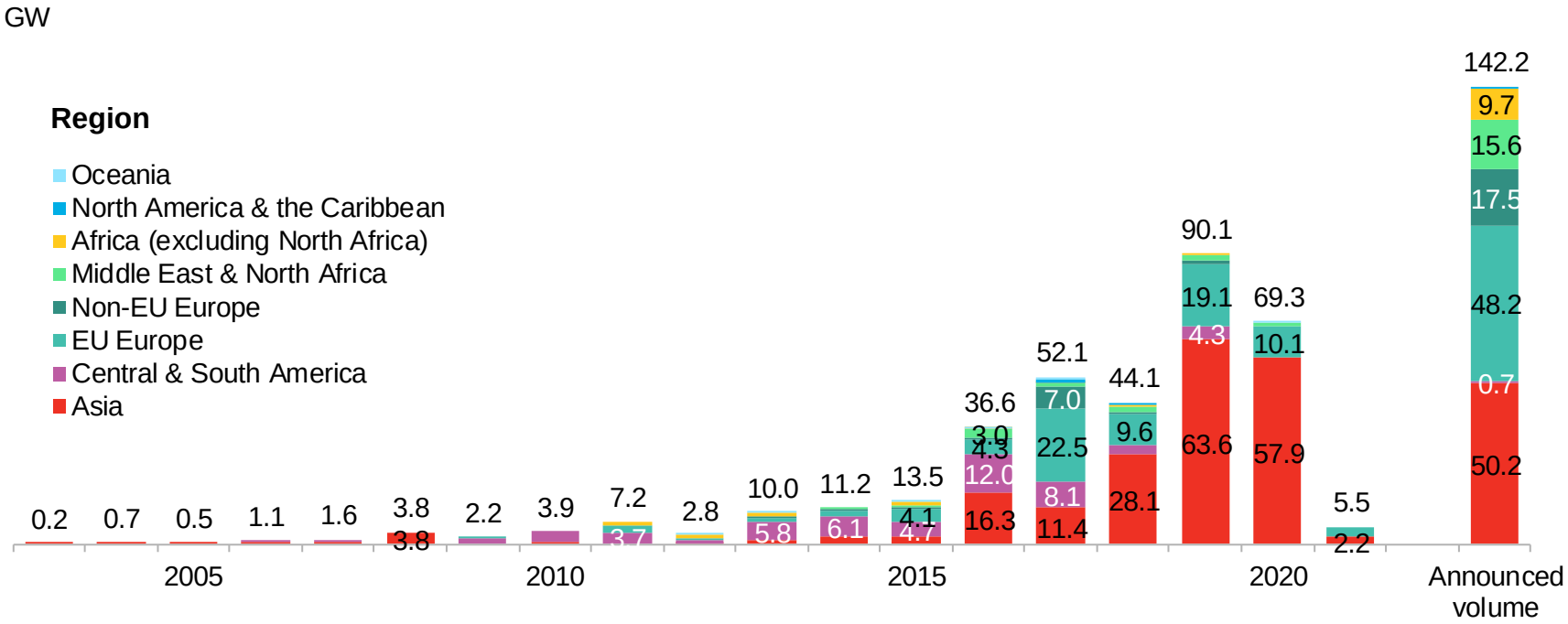
Annual auctioned and announced renewables capacity by region



Source: BloombergNEF. Note: Uses plant-level data for auctions where support is awarded for generation.

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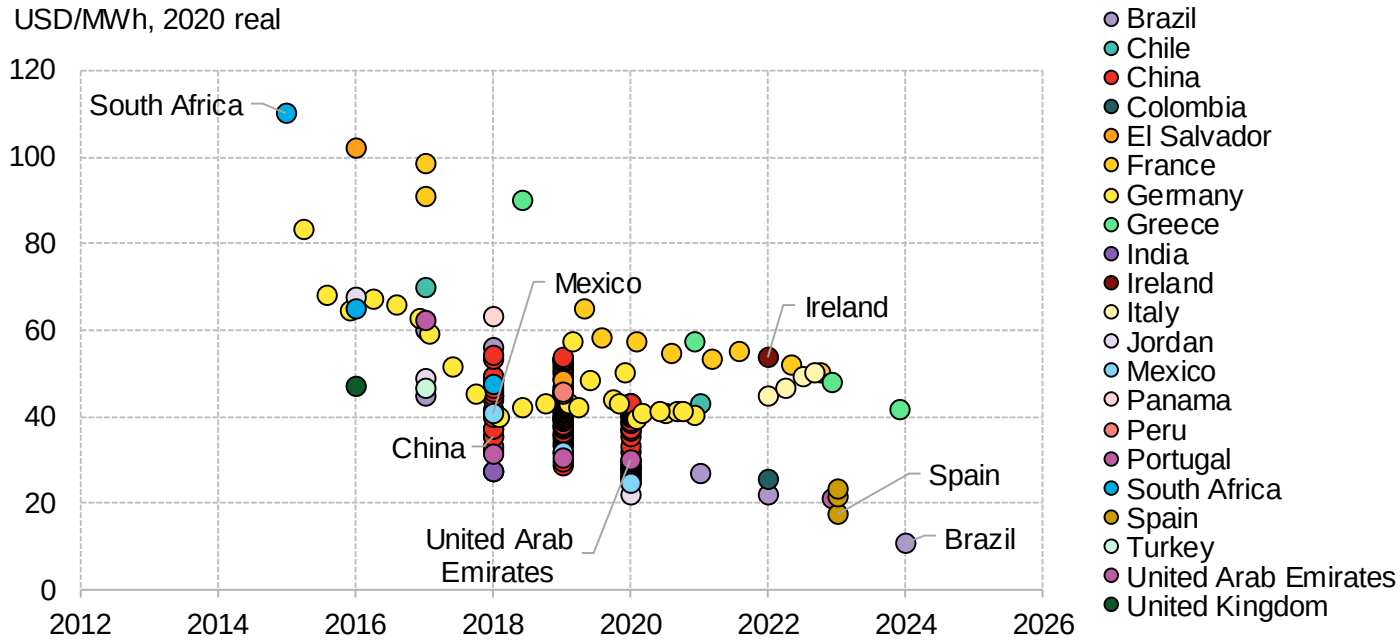
Global PV auction analysis

Levelized PV auction bids



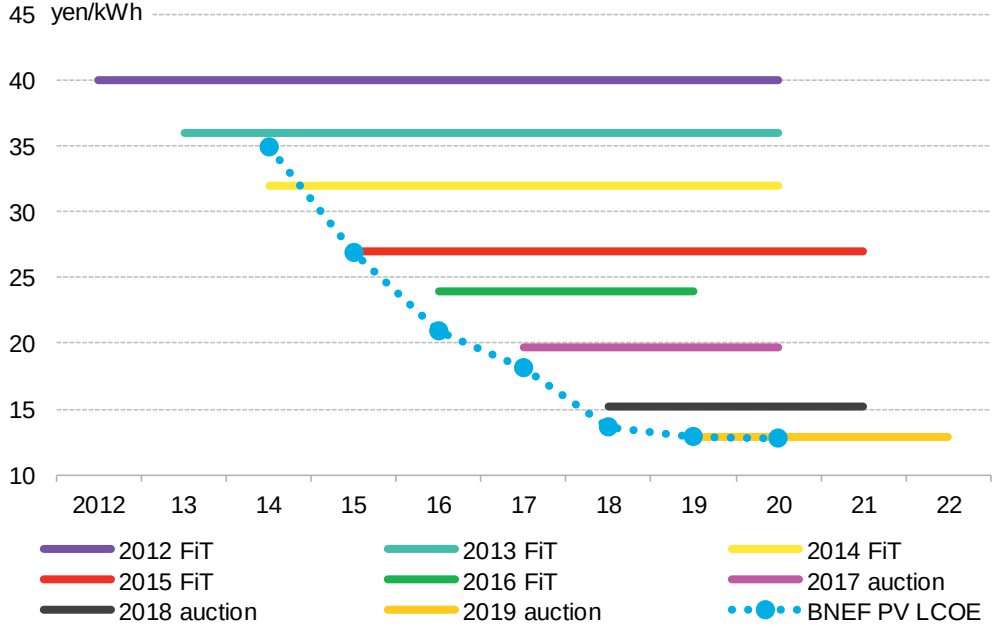
Energy auction bids are often misinterpreted as being comparable to our current LCOEs. In order to be able to compare these winning bid prices to our LCOEs, we have estimated what the average inflation-linked tariff would be over the full life of the project, and not just the tariff duration.

Source: BloombergNEF. Note: Country data in charts show the levelized average winning bid in the auction. Data reflective of commissioning. Assumes 0% discount rate.

BloombergNEF

太陽光発電コスト削減が鈍化する一方、買取価格は下がり続ける

太陽光発電買取価格とプロジェクトコストの推移



Source: BloombergNEF, Ministry of Economy, Trade, and Indusrry

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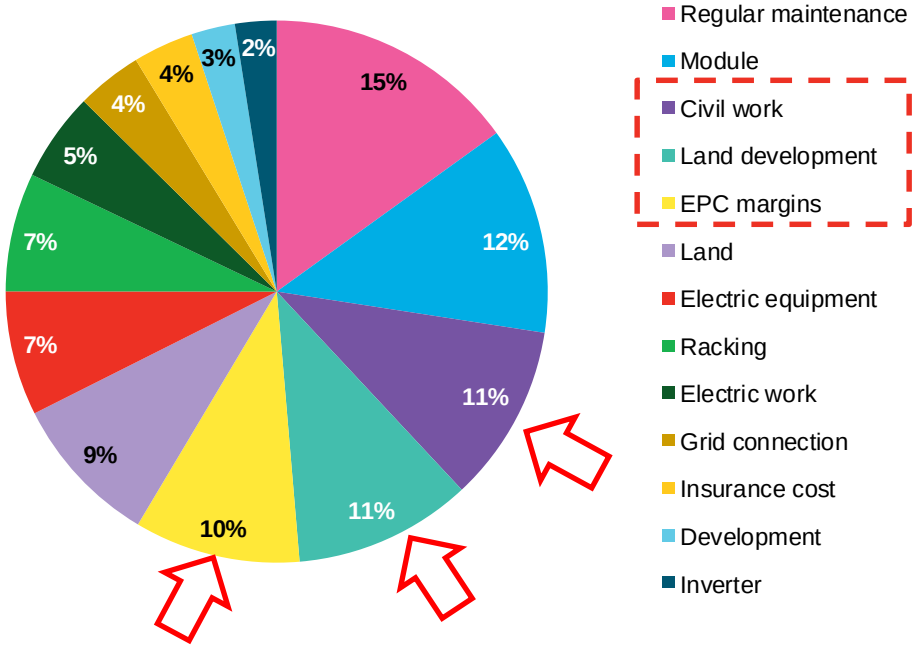
コスト高の要因は土地造成費、建設費に

1H 2020 国内太陽光発電LCOEのコスト内訳



Source: BloombergNEF. Note: Japan PV LCOE benchmark in 1H 2020 LCOE Update (web | terminal). Grid connection cost = 6,000 yen/kW.

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日本の現行入札制度では上限価格に張り付く

日本の最初の入札前のBNEFの３つのシナリオ

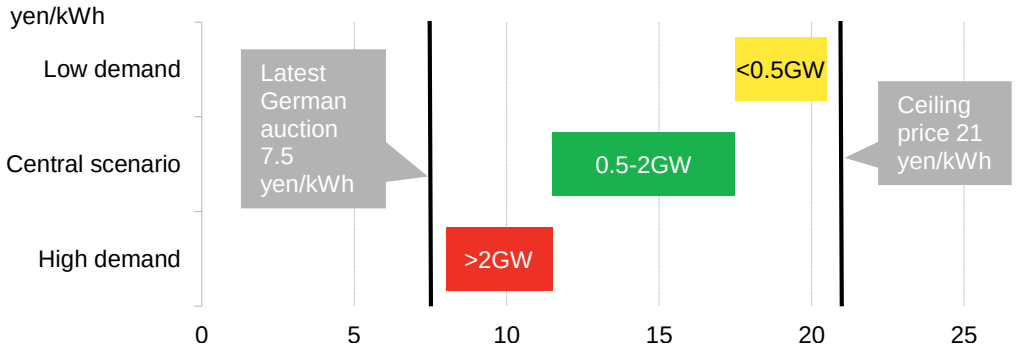


Table 1: BNEF scenarios for the Japan auction

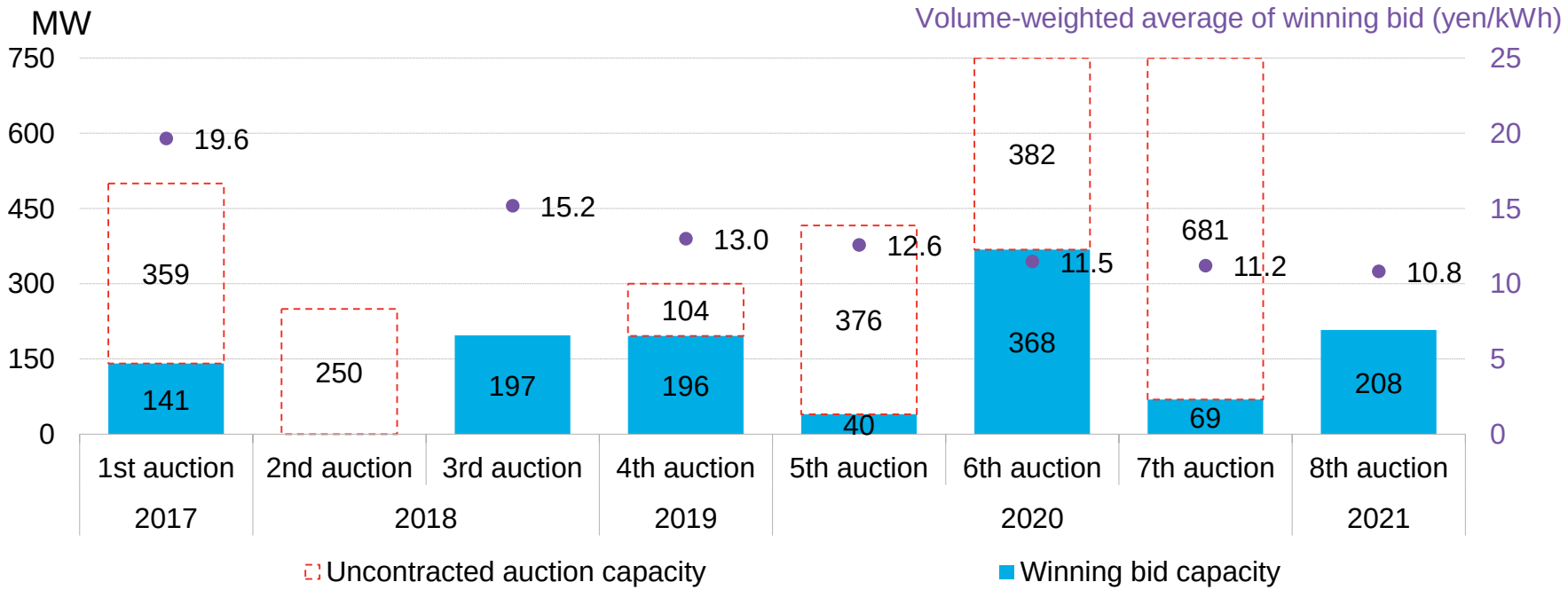
Scenario	Price range	Volume range	Probability
Central	12-17 yen/kWh	0.5-2GW	Highest
Low demand	18-20 yen/kWh	<0.5GW	Medium
High demand	8-11 yen/kWh	>2GW	Lowest

Source: BloombergNEF

- 入札が導入されると、価格は他国では29%から50%削減される
- 結果として19%削減

落札容量が少ない

国内の太陽光発電入札結果



Source: BloombergNEF, GIO

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開発リスクを下げつつ地域に還元できる入札制度が必要

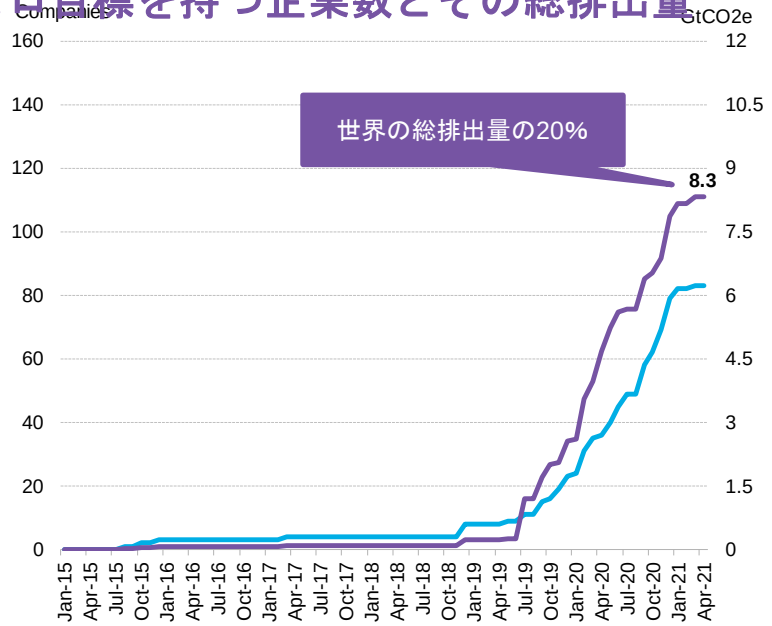
地域で求められる入札制度

- 系統の確保、利害関係者との調整や環境評価アセスなどの許認可を終えた(または大幅な短縮が認められる)土地を用意し、そこでリバースオークションを行う
- できるだけ地域の銀行や地元の事業者・建設業者・OMサービス企業、地域新電力などを用いることで事業やその電力と再エネ価値を地域に還元することが可能
- 環境価値
- 地域電源
- 脱炭素目標

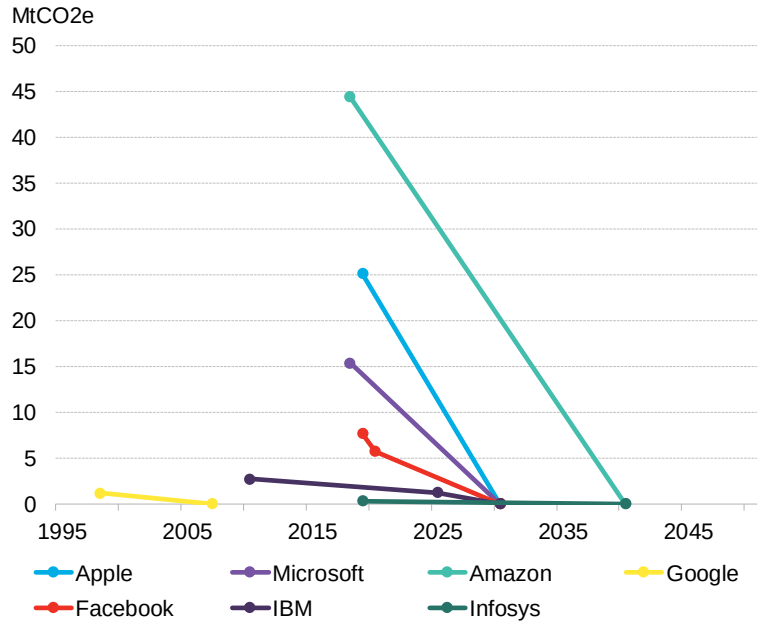
企業の脱炭素動向

企業のネットゼロ目標

Climate Action 100+対象企業の内、ネットゼロ目標を持つ企業数とその総排出量



テクノロジー企業のネットゼロ目標年



Source: BloombergNEF

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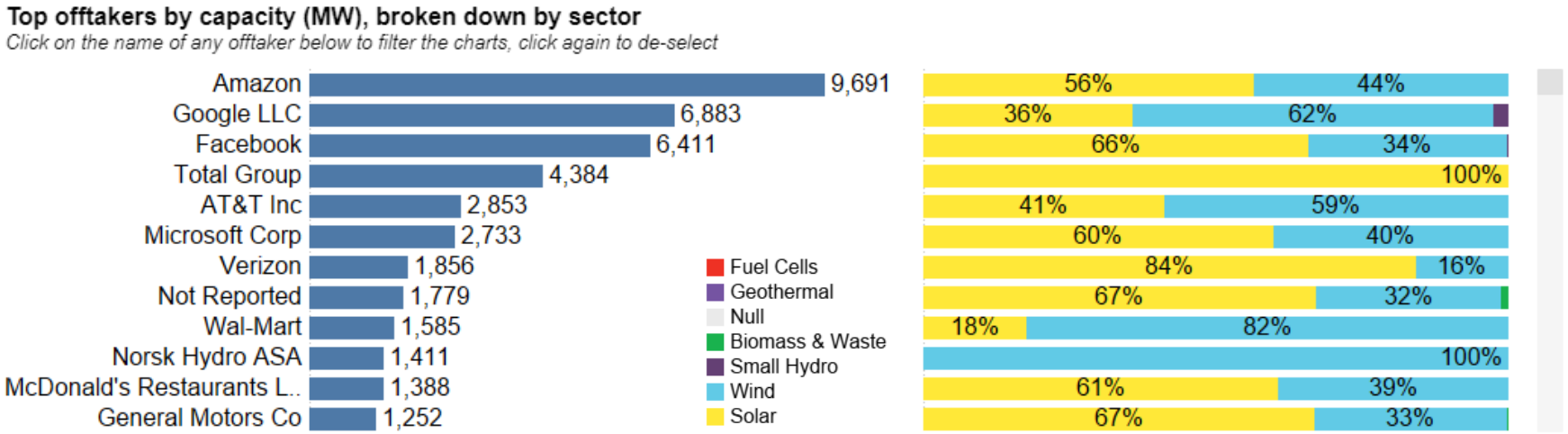
企業の再エネ調達

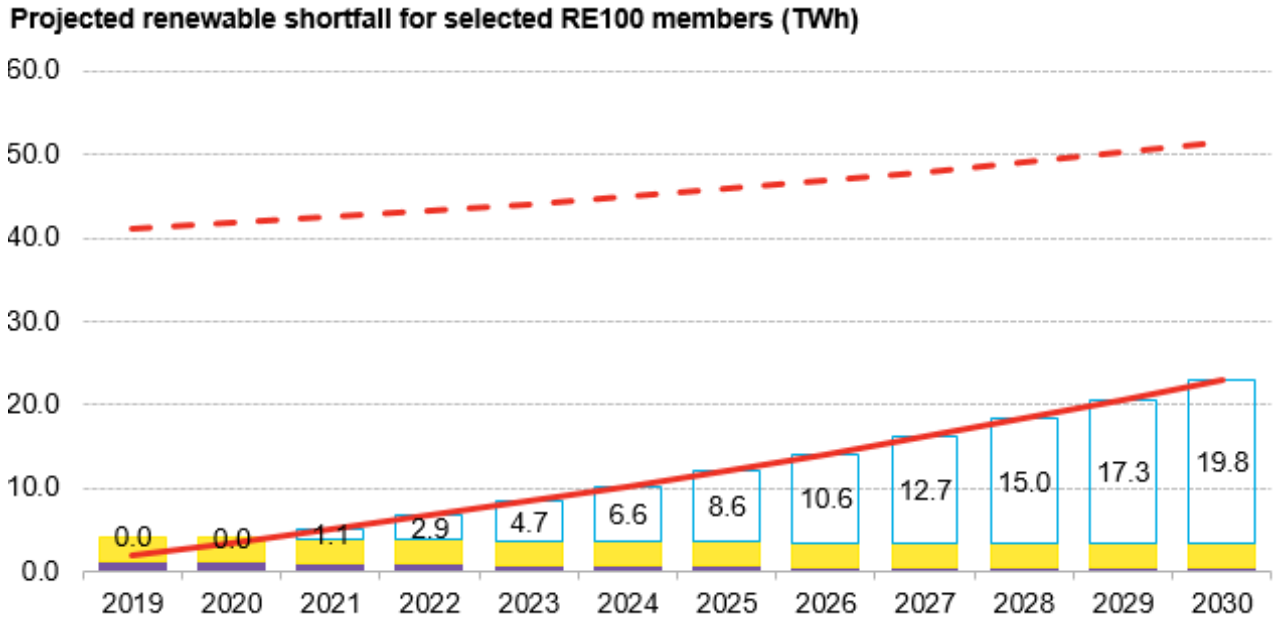
再エネ調達に積極的な企業とその調達量



Source: BloombergNEF

日本のRE100加盟企業50社となり、目標達成に必要な再エネ発電量増加

日本



Source: BloombergNEF, Bloomberg Terminal, The Climate Group, company sustainability reports

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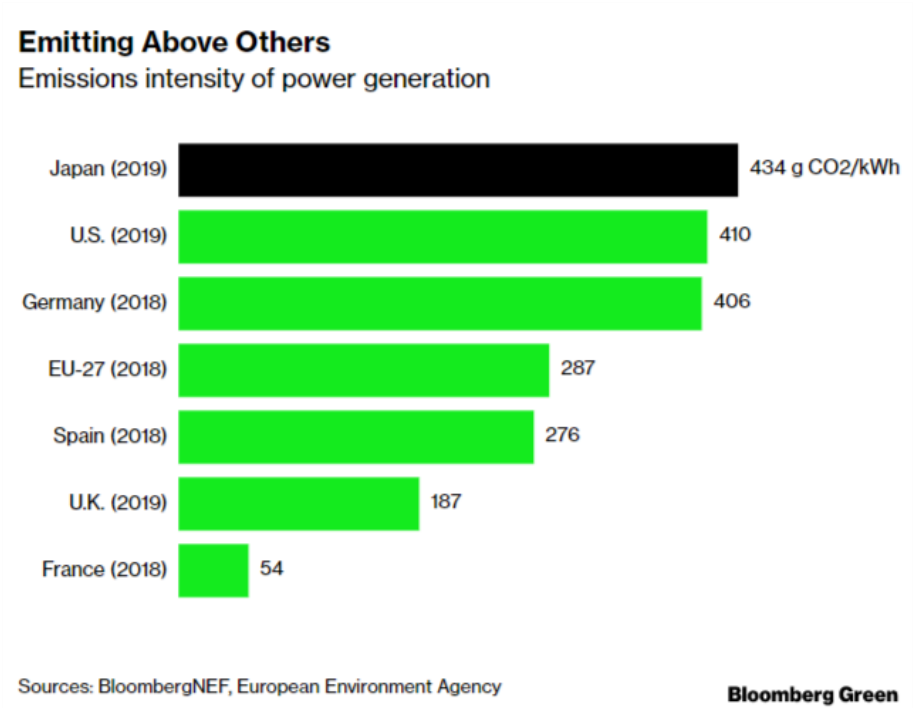
排出係数を下げ、再エネ購入の選択肢を増やすことが必須



Source: FT

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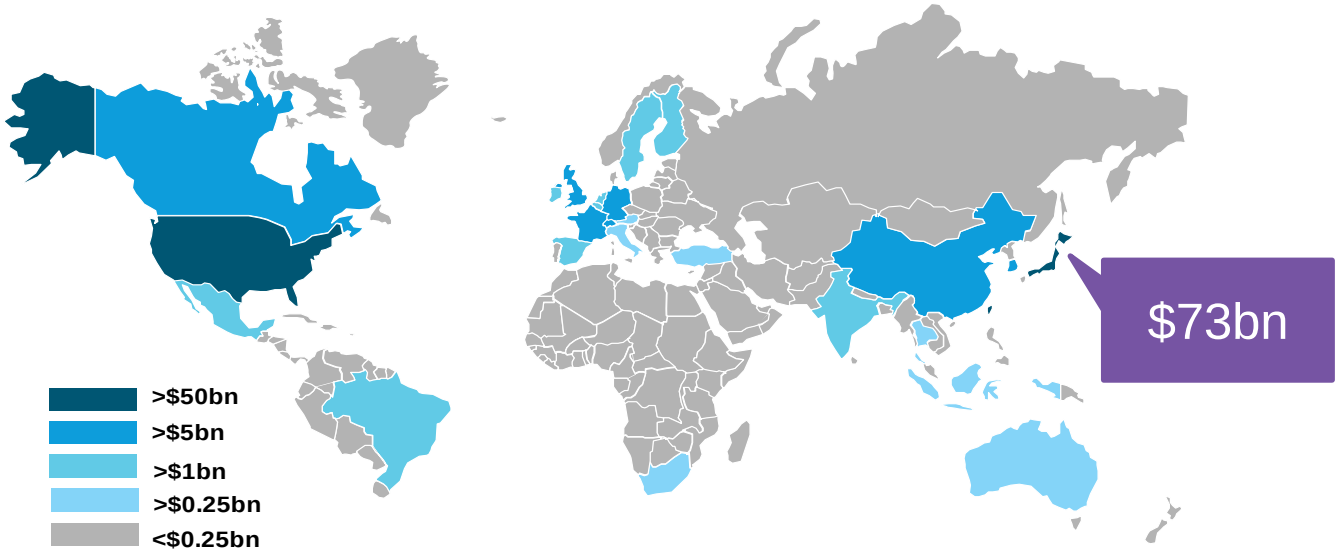
再エネ調達がビジネスの必須条件に

Supply chain financial intensity



Source: BloombergNEF, Bloomberg Terminal
Note: Chart is based on data available on Bloomberg's SPLC function, and does not necessarily represent the entire supply chain for this group of selected companies.

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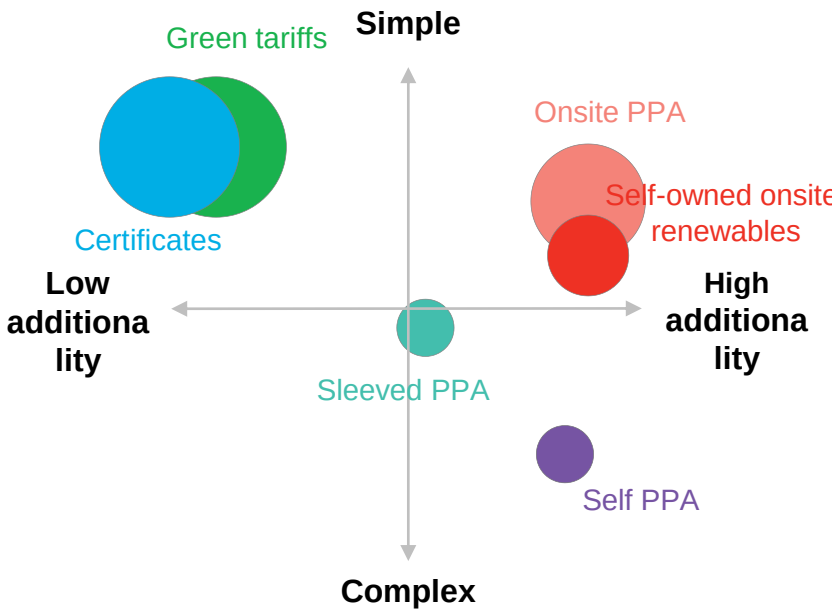
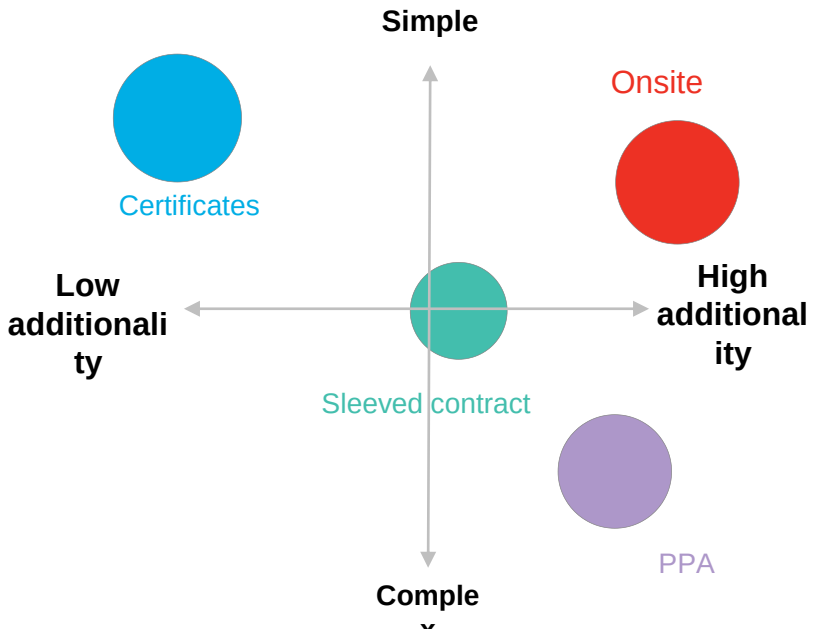
日本の再エネ調達とグローバルの違い

日本



グローバル



Source: BloombergNEF. Note: Bubble size shows popularity

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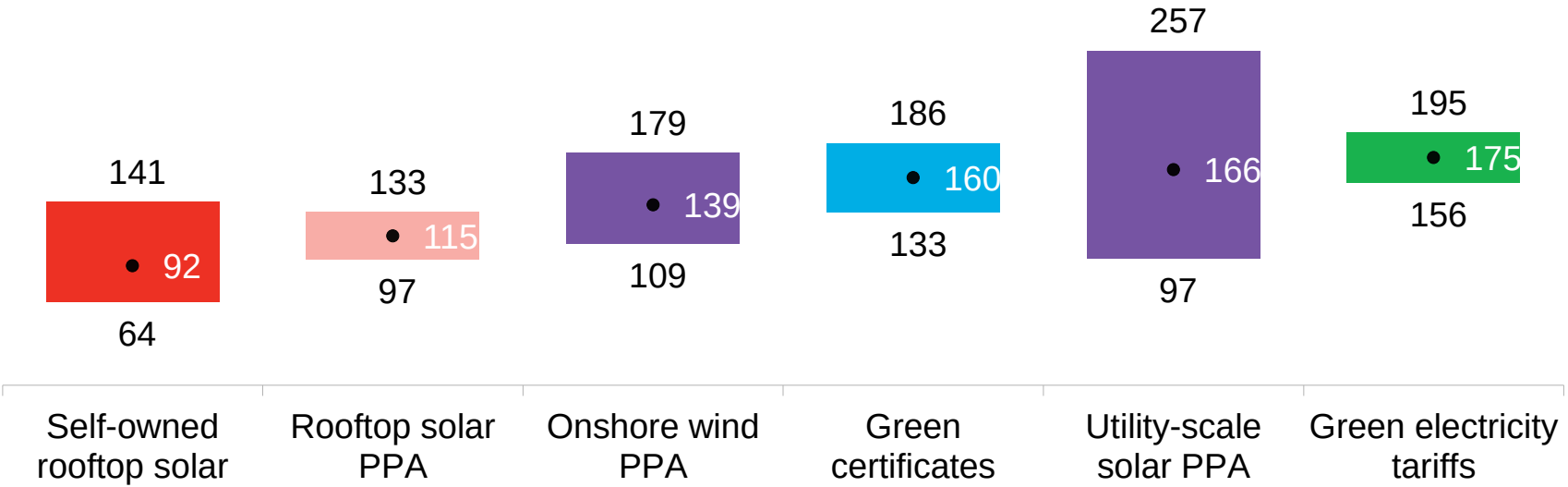
日本の再エネ調達のコスト
屋根上太陽光は最も経済的

USD/MWh (Real 2020$)



Source: BloombergNEF. Note: this comparison shows how much a buyer would pay for each mechanism to source 1MWh of clean energy. Project costs for self-owned rooftop solar and a self PPA are levelized over 20 years. Assumed fixed payments for other mechanisms (e.g. rooftop solar PPA, a green electricity tariffs, and green certificates) are levelized over 20 years. Black dots show the mid-cost scenario for self-owned rooftop solar and utility-scale solar PPA and simple averages of low- and high-end of our estimates for rooftop solar PPA, green certificate, and green electricity tariffs. Assuming 10-50MW onshore wind in 2022, 0.5-2MW ground-mounted solar in 2021-2022, and 0.5-2MW rooftop solar in 2021.

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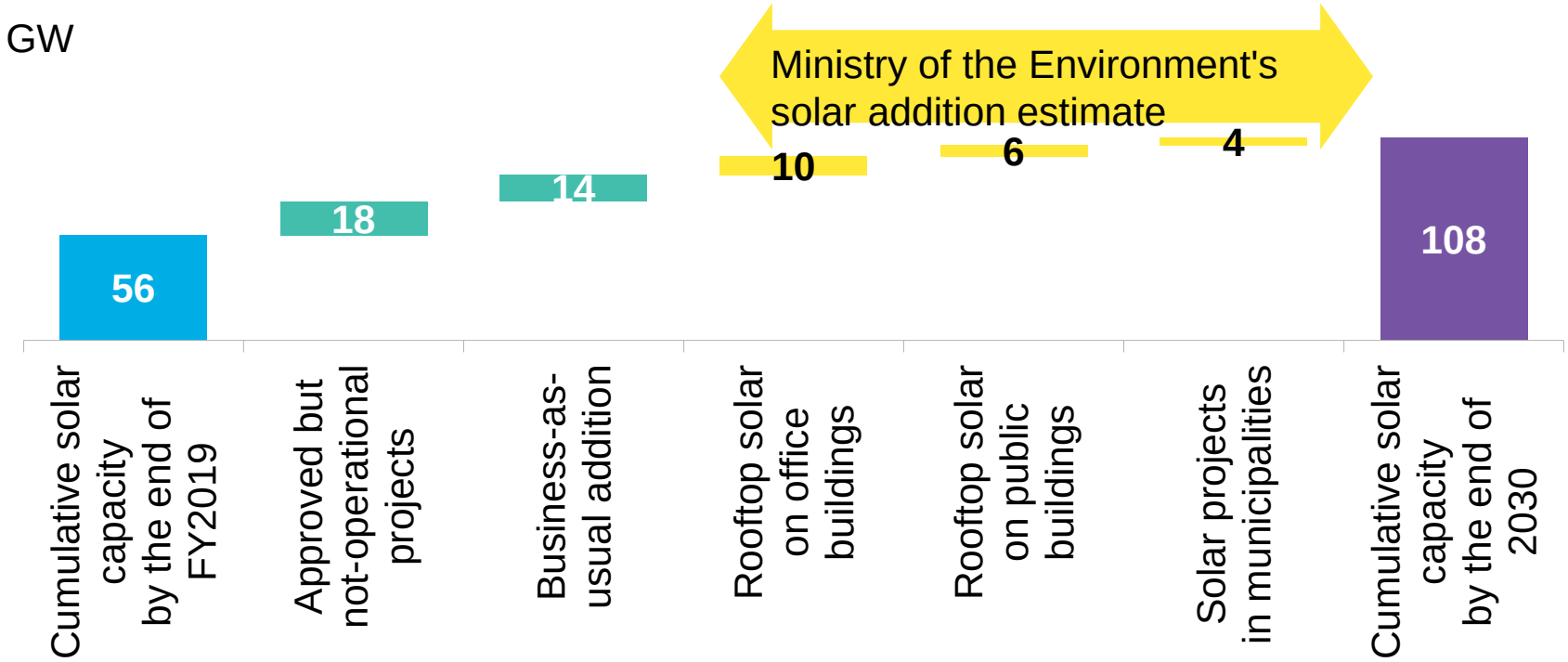
屋根上太陽光への期待



Source: BloombergNEF, Ministry of Environment Japan

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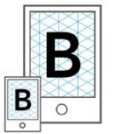

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