



Gales, Gigawatts, & Green Energy: Shaping Our Planets Future Through Alternative Energy

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Table of Abbreviations

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Abbreviation	Explanation
ABL	Asset-Based Loan
AG	Aktiengesellschaft
AI	Artificial Intelligence
APAC	Asia Pacific
Bn	Billion
BTM	Back of the Meter
C&I	Commercial and Industrial
CAGR	Compound Annual Growth Rate
CapEx	Capital Expenditures
CCUS	Carbon Capture, Utilization, and Storage
CFO	Cash From Operations
CNMV	Comisión Nacional del Mercado de Valores
D&A	Depreciation and Amortization
DCF	Discounted Cash Flow
DI	Digital Industry
DKK	Danish Krone
DoE	Department of Energy
EBIT	Earnings Before Interest and Tax
EBITDA	Earnings Before Interest, Tax, Depreciation, and Amortization
EBT	Earnings Before Tax
EMEA	Europe, Middle East, and Africa
EPS	Earnings Per Share
ESaaS	Energy Software as a Service
Etc.	Et Cetera
EU	European Union
EV	Electric Vehicle
EV	Enterprise Value
FCF	Free Cash Flow
FTM	Front of the Meter
FX	Foreign Exchange
FY	Fiscal Year
GDIP	Green Deal Industrial Plan
GDP	Gross Domestic Product
GW	Gigawatt

Abbreviation	Explanation
H ₂	Dihydrogen
HVAC	Heating, Ventilation, and Air Conditioning
ICE	Internal Combustion Engine
IoT	Internet of Things
IRA	Inflation Reduction Act
ITC	Investment Tax Credit
JV	Joint Venture
kWh	Kilowatt Hour
LIBOR	London Interbank Overnight Rate
LTM	Last Twelve Months
M&A	Mergers and Acquisitions
M ³	Cubic Meters
MM	Million
MO	Mobility
MSCI	Morgan Stanley Capital International
MW	Megawatts
NOPAT	Net Operating Profit After Tax
PE	Price to Earnings
PP&E	Property, Plant, and Equipment
PTC	Production Tax Credit
PV	Photovoltaic
R&D	Research and Development
SFS	Siemens Financial Services
SHL	Siemens Healthineers
SI	Smart Infrastructure
T	Total
TAM	Total Addressable Market
TTF	Title Transfer Facility
TV	Terminal Value
U.S.	United States
USD	U.S. Dollar
VPP	Virtual Power Plant
WACC	Weighted Average Cost of Capital

Executive Summary



Siemens should not acquire...

Vestas®

Key Items



- A Danish wind power company that develops, manufactures, sells, and services wind power plants
- Onshore wind power is becoming less prominent; Vestas has shifted its **focus towards developing offshore wind** projects

Valuation/Transaction



- Vestas has a market cap of ~\$30 Bn
- Significant leverage would need to be taken on by Siemens to make a transaction of this size feasible – risk of **credit rating downgrade**
- Would be **the largest transaction** that Siemens has done to date

Reasoning



- Capitally intensive – Siemens spun-off their Gas & Power segment which includes **Siemens Gamesa** – a competitor to Vestas
- **Does not fit the broader image of Siemens'** brand – a digitally focused company aiding renewable adoption
- Wind project are **competitive** and take **many years to complete** while achieving marginal returns

instead, Siemens should acquire...

stem



- Energy storage hardware and advanced technology solutions to control solar asset performance
- Focused on providing commercial customers with data to make analytical decisions with produced energy
- **Direct play** into smart and microgrid systems in the U.S.



- Stem, Inc. has a market cap of ~\$1.4 Bn
- Team analysis suggests a **35% premium** to current share price of **\$7.37**
- Siemens Fluence would grow their total North American gigawatts deployed by ~**110%** if Siemens were to acquire Stem



- **Battery storage and solar energy** are experiencing massive growth in the U.S.
- Stem's business is **better aligned to Siemens'** long-term strategic goals
- Will see both ITC and PTC from the IRA, and fits seamlessly into **Fluence** – Siemens' clean energy tech business

Industry Analysis



Global Industrials Overview

European industrials face several headwinds moving into 2023

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Key challenges in 2022

-  The war in Ukraine impacted overall economic conditions in the first quarter of calendar 2022. Energy prices – already soaring in the latter half of 2021 – skyrocketed in the first half of calendar 2022
-  Regulatory restrictions on several sectors and companies along with a recession. China's GDP growth is expected to slow significantly in calendar 2022, to 3.0%, after it rebounded in calendar 2021 with 8.1%
-  China's zero-COVID strategy became even more strict with the emergence of highly infectious variants, resulting in more major lockdowns which burdened economic activity and global supply chains in the second half of calendar 2021

2023 outlook by global geography

Europe



- European industrial demand **could lose strength**. Rising rates and sustained inflation mean consensus earnings may need to be **cut by 10-15%**. Defensive sectors including **grid, energy** and mining-equipment manufacturers could **outperform**

North America



- North American industrials' **demand strength will lose momentum** as economic and inflationary concerns cloud the outlook. Supply-chain eases, yet favorable pricing will temper with slowing demand. Sectors including energy and Aerospace could outperform

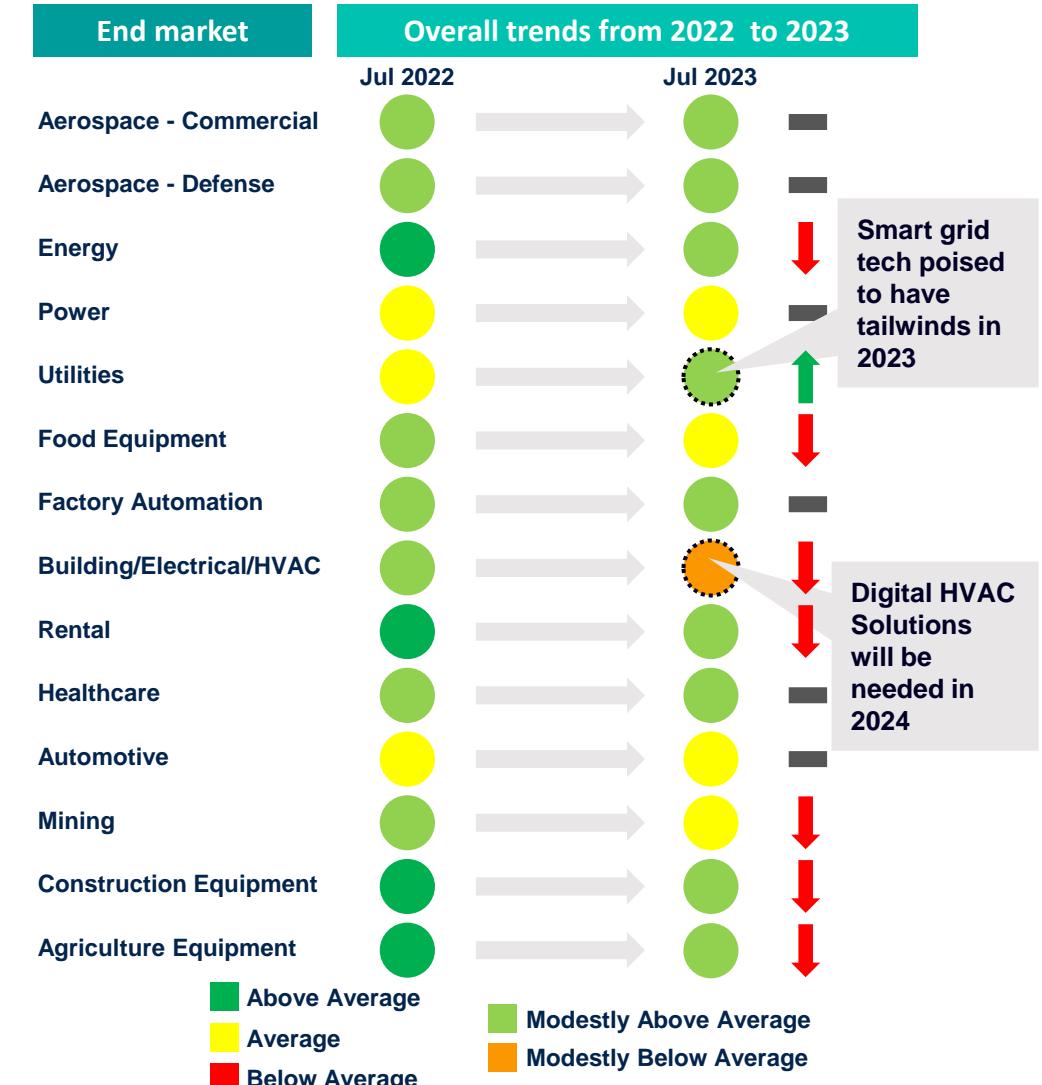
Asia



- As the industry works off an order backlog and China eases Covid restrictions, demand for chipmaking equipment may fall while auto-sector investment has room for a delayed rebound

Source: (Bloomberg, 2023), (Capital Markets Day (Siemens, 2022))

Trends effecting critical end markets...

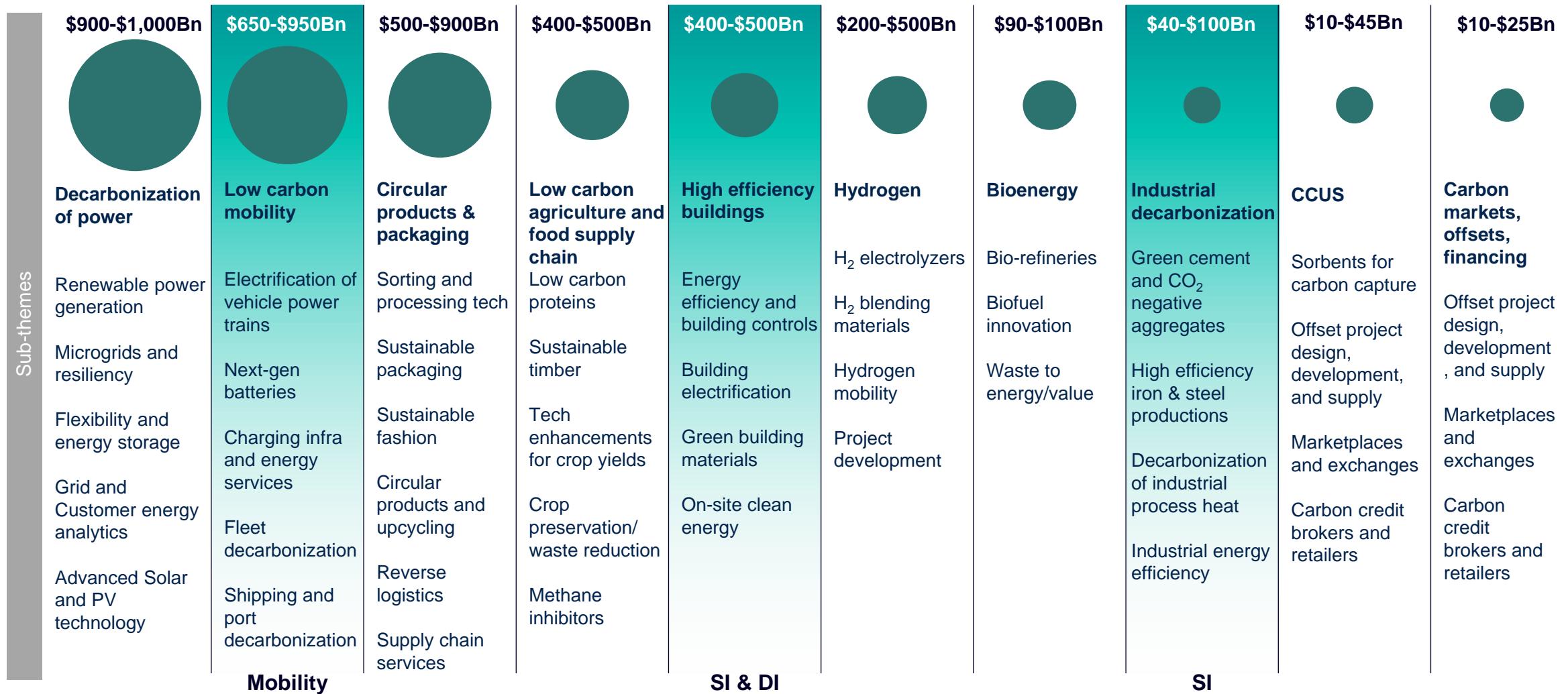


Decarbonization TAM

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Clean energy well positions many of Siemens' core businesses to react to the addressable market

Decarbonization sits the center of a ~\$5 Trillion TAM



Source: (McKinsey & Company (2), 2022)

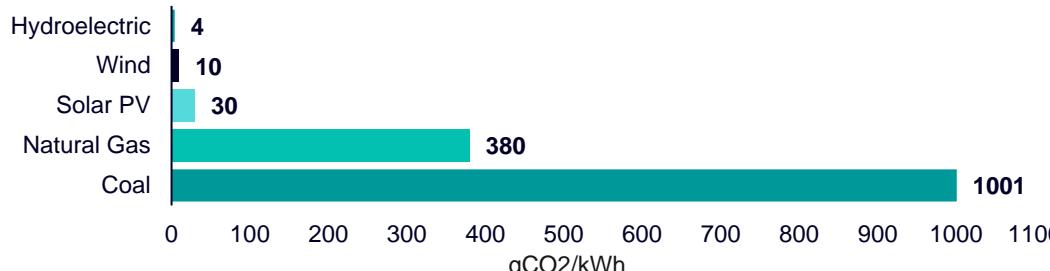
Global Renewables Overview | Wind

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A beneficiary of the push for cleaner energy with lingering concerns on profitability

Wind is a viable option for decarbonization...

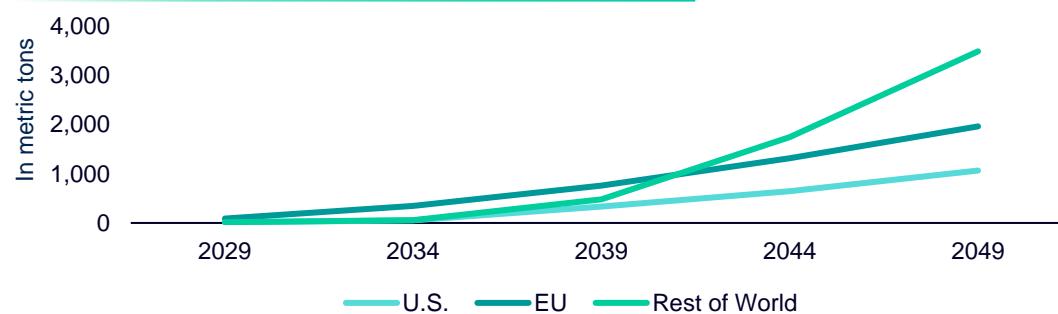
Electricity sources by emissions



- The push for **decarbonization** is continuing to play a pivotal role in both the acceptance and adaption of wind power systems
- An estimated **1.7 billion tons of steel** are needed to build enough wind turbines to reach net zero by 2050

...but is still facing turbulence

Global wind turbine waste forecast

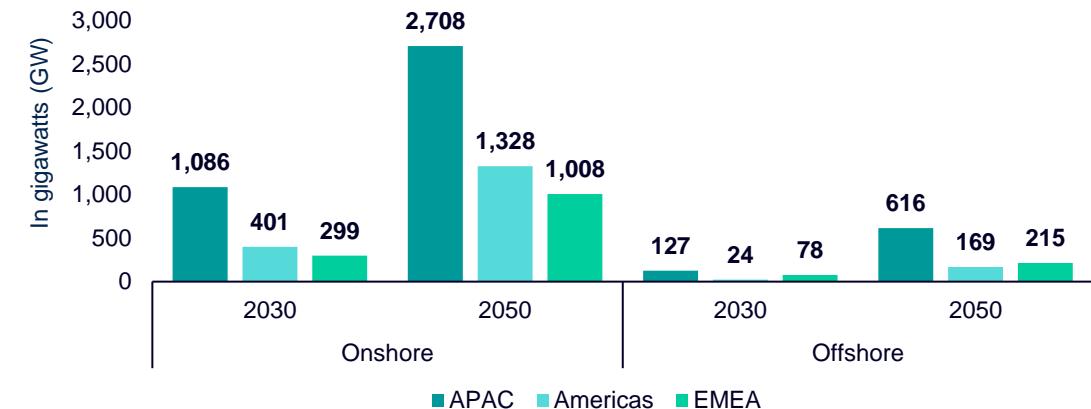


- Although wind turbine producers will benefit from the push for cleaner energy, 2022 was an unfavorable year due to **supply chain issues, material inflation, and unfavorably priced contracts**

Source: (Ferris, 2021), (GWEC, 2022, Statista), (Wood Mackenzie, 2022)

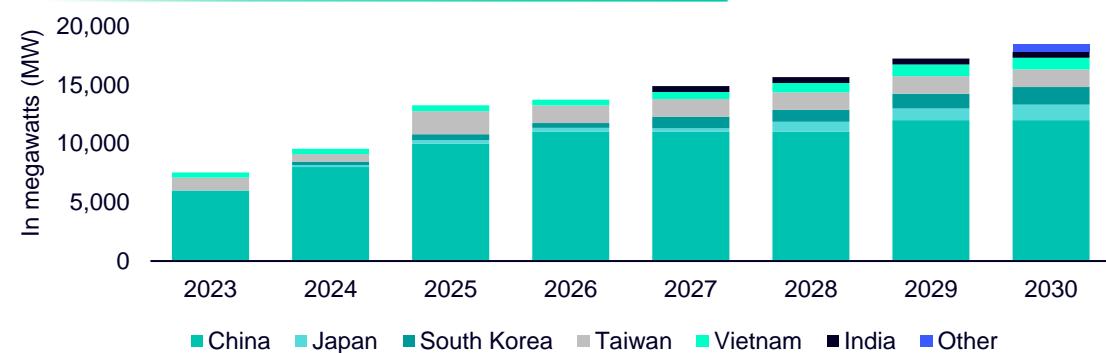
...which will increase its presence onshore and offshore

Installed wind power capacities forecast



...with Asia being primed for offshore opportunities

Offshore wind installations in Asia by 2030



- Asia is expected to account for nearly **100 GW** in offshore wind capacity by 2030 and account for **over 60%** of offshore wind capacity by 2050

Renewables Overview | Solar & EVs

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Setting the stage for a transition to smarter and more efficient energy resources

Solar energy is a direct play into the grid...

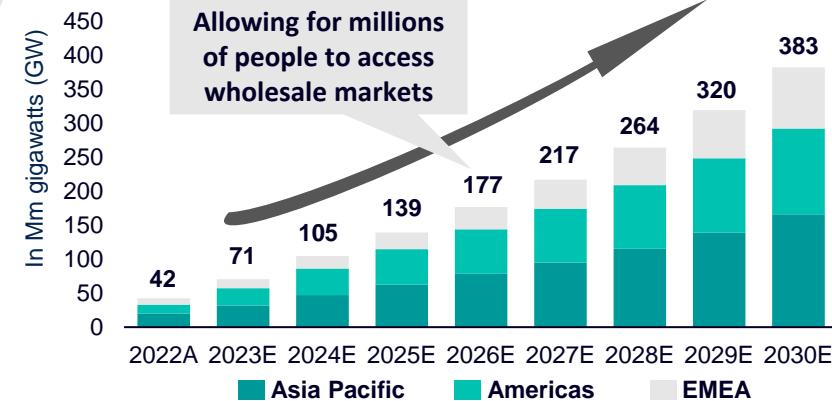
- The current grid system is archaic and serves no direct benefit to the consumer beyond consumption
- With developing renewable energy systems, consumers are now able to tie their residential systems into a **Smart Grid** through “**Net-Metering**”

The smart grid market size is growing steadily through 2026



...necessitating leaps in battery storage technology

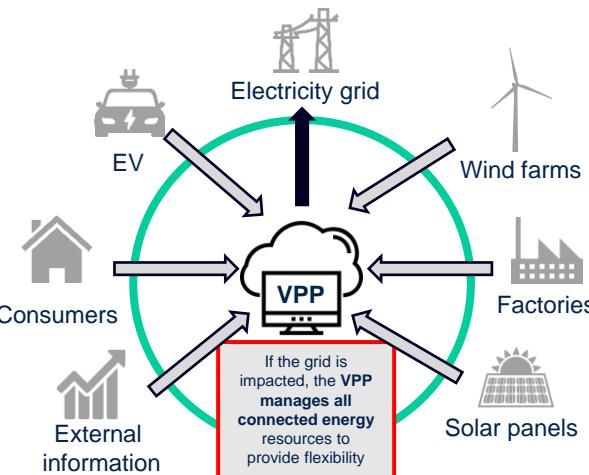
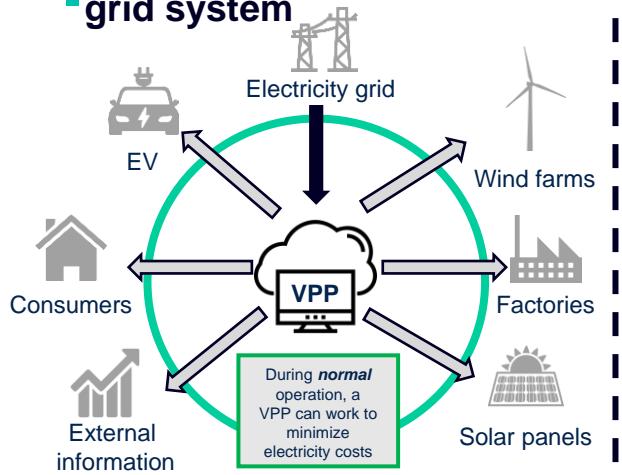
Battery storage capacity outlook by geography



Federal policy supporting renewables

① Inflation Reduction Act (IRA)	③ GDIP	② Chinese Subsidies
U.S.	Europe	China
Low-carbon tech	Clean energy transition	Clean tech investment incentives
Federal tax credits of \$369Bn	Credits under negotiation	\$275Bn of government subsidies
Rapid access to funding	Response to the IRA and Chinese subsidies	Manufacturing of net-zero tech is dominated by China
Open trade for resilient supply chains	More govt. support	

Virtual Power Plants gives access to all players of the energy grid system



Electric vehicle infrastructure is on the rise globally



Source: (NextMSC, 2020, Statista), (Business Wire, 2021, Statista), (Barclays, 2023), (Bloomberg NEF, 2023), (Wood Mackenzie (1), 2023)



Company Overview

SIEMENS

| Overview

Vestas

| Overview

SIEMENS
+
Vestas

| Strategic Fit



Company Overview

SIEMENS

| Overview



Vestas

| Overview



**SIEMENS +
Vestas**

| Strategic Fit

Siemens Overview

SIEMENS

Siemens is a German engineering giant who invests heavily in technologies of the future

10,000-foot view of Siemens

- **Siemens AG (SIE-DE)** is an engineering and manufacturing company headquartered in Munich, Germany that focuses on areas of electrification, automation, and digitalization
- Siemens is **the largest industrial manufacturing company in Europe**
- The company's revenues are segmented into four distinct areas: Siemens Healthineers, **Digital Industries**, **Smart Infrastructure**, **Mobility + Other**
- Part of Siemens' strategy revolves around divestitures of capital intensive business models while **strengthening their brand of renewables through M&A**
- Smart Infrastructure focuses on **decarbonizing energy sources** and seeks to capitalize on **Europe's renovation wave** with their suite of building technologies
- "Today, Siemens AG focuses on future-oriented technology fields. It combines hardware, software and innovative services to create value." – Jim Hagemann Snabe – Chairman of the Supervisory Board

A coordinated portfolio of product and service segments...

Digital Industries

- Automation technology services and operating system software related to manufacturing



Other

- Other segments consist of **Mobility**, Portfolio Companies, and Siemens Financial Services

Healthineers

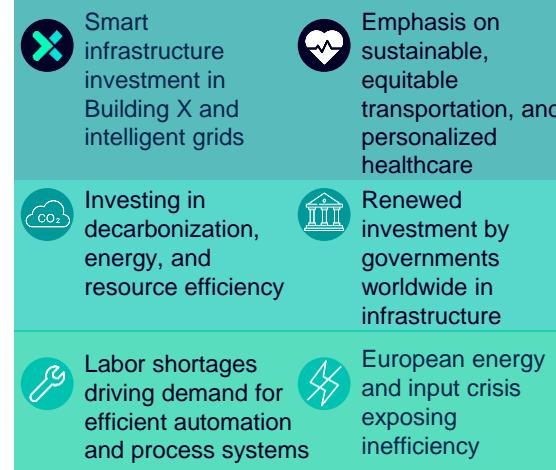
- Develops, manufactures, and sells a range of diagnostic and therapeutic products to healthcare providers

Smart Infrastructure

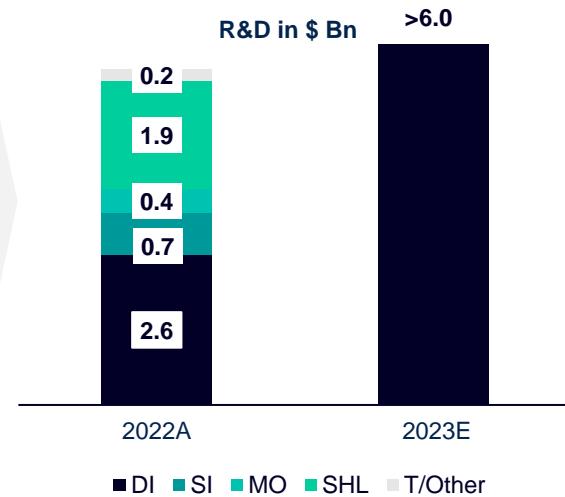
- Connecting buildings' energy systems - R&D enhances digital offerings related to renewable energy integration

Source: (Annual Report (Siemens, 2022)), (Earnings Release (Siemens, 2022))

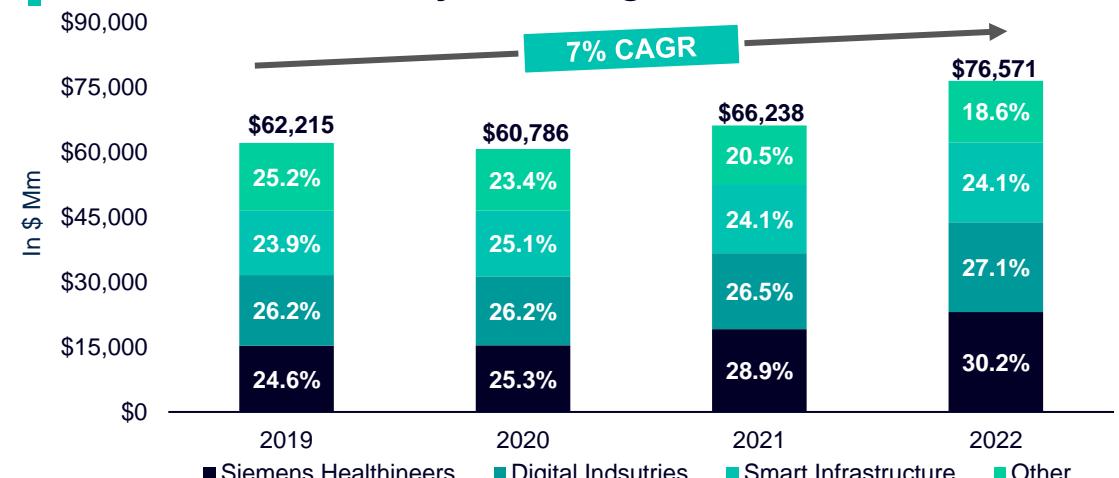
Secular trends driving new opportunities...



...and Siemens is allocating resources into these areas



...that has seen steady revenue growth

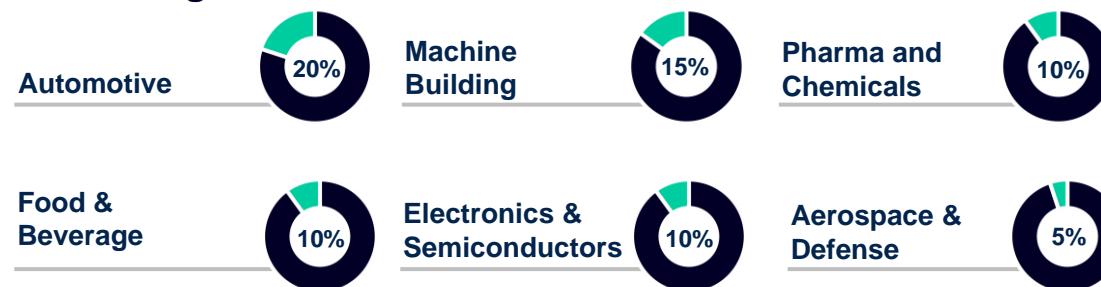


Note: Expressed in USD with a conversion rate of 0.94 as of 2/20/23

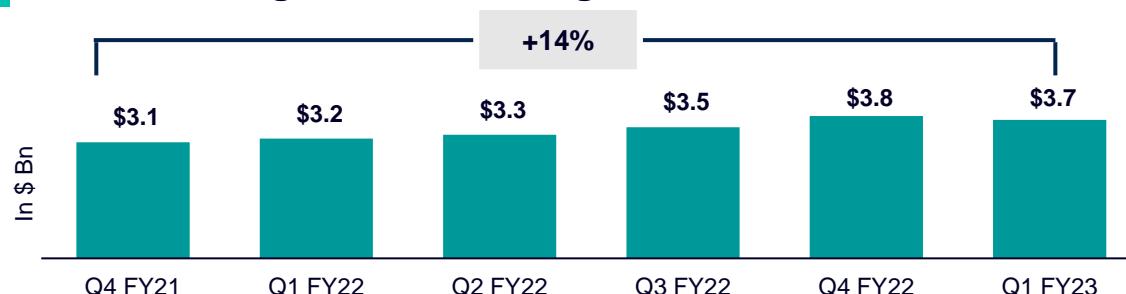
Segment overview

- By fusing the physical and digital worlds and harnessing the power of both hardware and software, **Digital Industries** assists clients in fully realizing the potential of data for their business
- By combining operations that formerly operated in independent streams of data, they **enable the Industrial Internet of Things (IoT)** a network that spans the entire value chain, from shop floors to corporate headquarters and from sensors to cloud
- The Digital Enterprise Portfolio is the centerpiece of its offerings which assist business' in reducing development timelines and enhancing flexibility, productivity and environmental efficiency of their manufacturing processes

Continued growth in vertical end markets



With increasing annual recurring revenue



Three influential business trends



In today's increasingly digitalized environment, producers of investment goods must **modernize production** capacity in order to effectively increase production flexibility and reduce process timelines



Current conditions encourages producers to complement their primary products with service options and vertical solutions, which consumers desire to take advantage of investment goods in their entirety



Trends are **shifting away from globalization** towards reorganization to support **local economic development**, strengthen supply chains, and better adapt solutions to needs on a regional level

Digital Industries has significantly transformed business processes



10x faster innovation process

No. 1 for automation systems and industrial software



24/7 activities to ensure industrial security

Digital Industries



30% savings in service and maintenance costs



99.99% quality through Digital technologies



50% faster time to market with the digital twin

Source: (Annual Report (Siemens, 2022), (Busch, R., Ag, S. and Thomas, R., 2023), (Siemens, 2023), (Bloomberg, 2023)

Note: Expressed in USD with a conversion rate of 0.94 as of 2/20/23

Siemens Overview | Smart Infrastructure

SIEMENS

Diversified product line to support a transition from fossil to renewable energy sources and smarter more sustainable communities

Segment overview

- Siemens Smart Infrastructure Segment is focused on **intelligently connected energy systems, buildings, and industry**
- The smart infrastructure segment offers a wide array of market specific solutions for industries such as **airports, data centers, smart urban communities, transportation and logistics, and wind**
- The wind product offerings focus on **power transmission and distribution systems, auxiliary monitoring, and industrial communication; all with the goal of optimizing wind power systems**
- By offering products which digitize global infrastructure, energy utility companies, airports, and municipalities can run efficiently, safely and reliably
- These smart infrastructure products also **mitigate risk** in what are normally large investments, making sure they work perfectly and efficiently every time

Building our future energy resources intelligently...



SIRIUS 3RT

- Reliable circuit breaker rated to produce technical data in the harshest of ambient conditions
- Compliant with worldwide standards resulting in high TAM



SCALANCE & RUGGEDCOM

- Offers real-time status and performance information in the most remote of wind fields
- Helps customers integrate wind turbines optimally into their networks

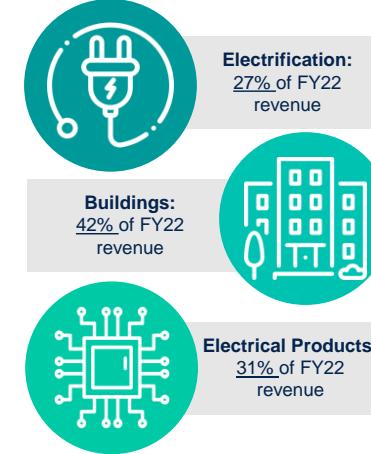


SIVACON 8PS

- Delivers economical and secure supply of energy while lowering total cost of energy
- Bears thermal load better than traditional cables

Source: (Capital Markets Day (Siemens, 2021)), (Bloomberg, 2023), (Smart Grid System Report, 2018, Statista)

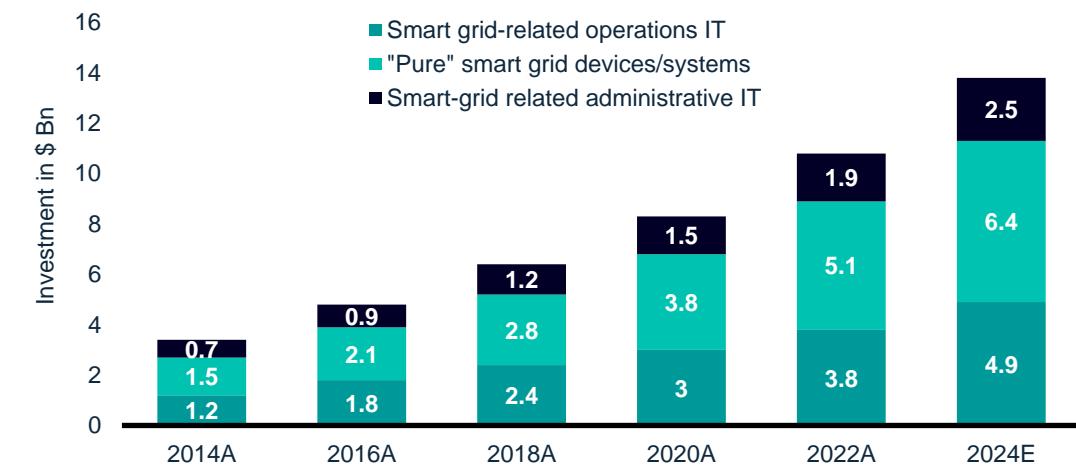
Smart infrastructure product mix



Sustainable energy transition and sustainable communities represent a massive market



Investment In Smart Infrastructure on the rise Smart Grid Investments By Sub-Vertical



Note: Expressed in USD with a conversion rate of 0.94 as of 2/20/23

Siemens Overview | Mobility

SIEMENS

Siemens is focused on modernizing their Mobility solutions by enhancing technological inputs

Re-imagining the oldest mass transit mode

Rolling Stock	Rail Infrastructure	Services	Turnkey
 <ul style="list-style-type: none"> Manufactures trains for urban and regional transport including metro systems, trams, and light rail Short-distance, regional, and long-distance rolling stock 	 <ul style="list-style-type: none"> Rail automation and solutions Automatic train control systems Interlocking operations control and telematic systems Digital station solutions 	 <ul style="list-style-type: none"> Maintenance and digital services Consulting, planning, financing, construction Railigent X – open application suite leverages IoT and AI for rail asset management 	 <ul style="list-style-type: none"> Bundles consulting, planning, construction, service, and operation or complete mobility systems Complete rail solutions integrating the entire rail portfolio and beyond
Customer examples 	Customer examples  	Customer examples 	Customer examples 

Offerings in mobility for the digital age

Expanding digital offerings to make smart transit systems

- Mobility's software business offers Intermodal solutions, including platforms for fleet management, route planning, ticketing and payment solutions, and data analytics

Growing digital transit Smart Infrastructure

- In 2022 Siemens Acquired Sqills, a Dutch provider of cloud-based ticketing software for public transportation operators

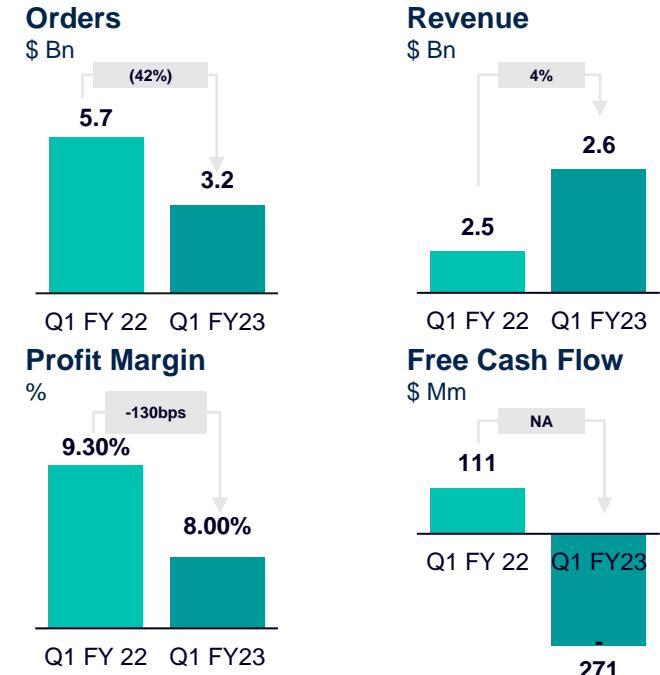
Sharpening focus on smart public rail transit

- In 2022 Siemens also fully divested from Yunex, a road infrastructure solutions company



Source: (Annual Report (Siemens, 2022)), (Capital Markets Day (Siemens, 2021))

Mobility operating metrics



Core business is centered around ESG

- Rail is the most environmentally friendly mode of transport
- Train travel can make an important contribution to reach EU CO₂ emission targets by 2050



Core ESG efforts



Investment in sustainable technologies

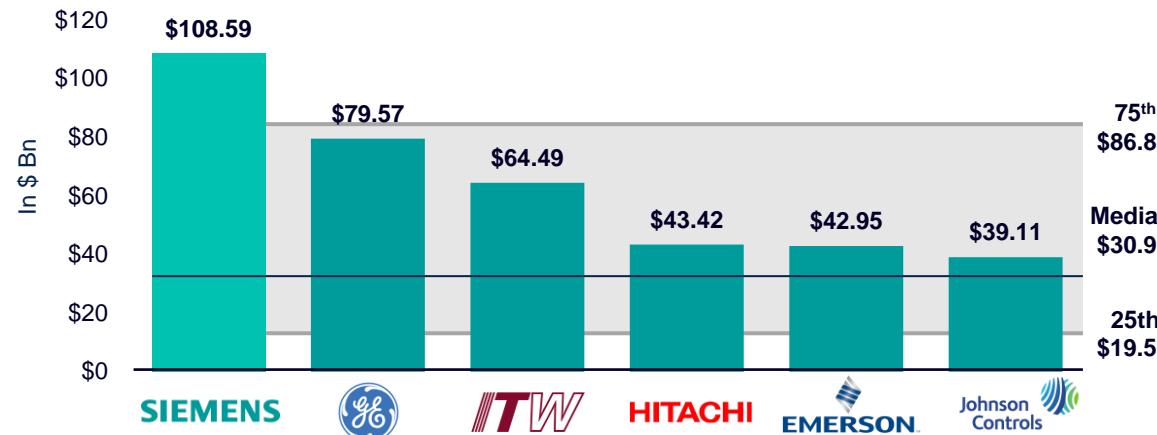
Note: Expressed in USD with a conversion rate of 0.94 as of 2/20/23

Siemens' Market Positioning

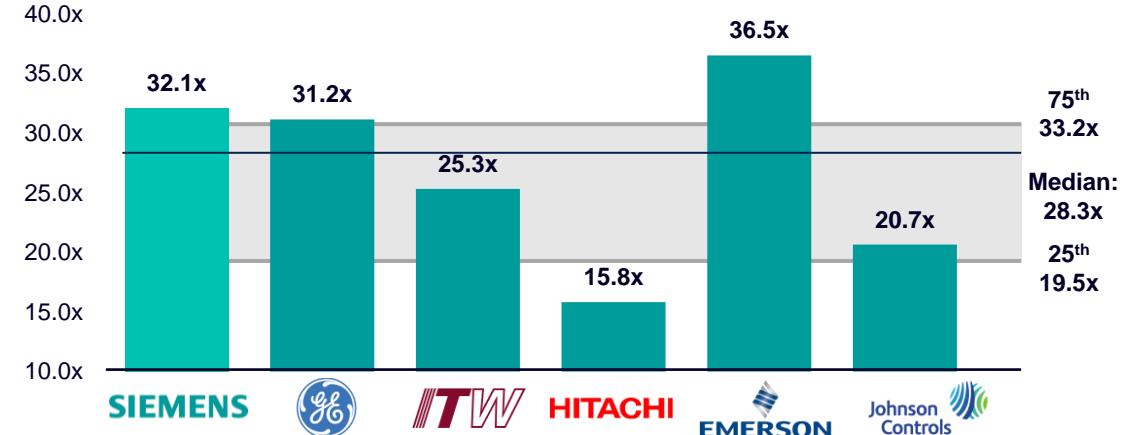
SIEMENS

Siemens' size makes it the largest capital goods conglomerate in Europe

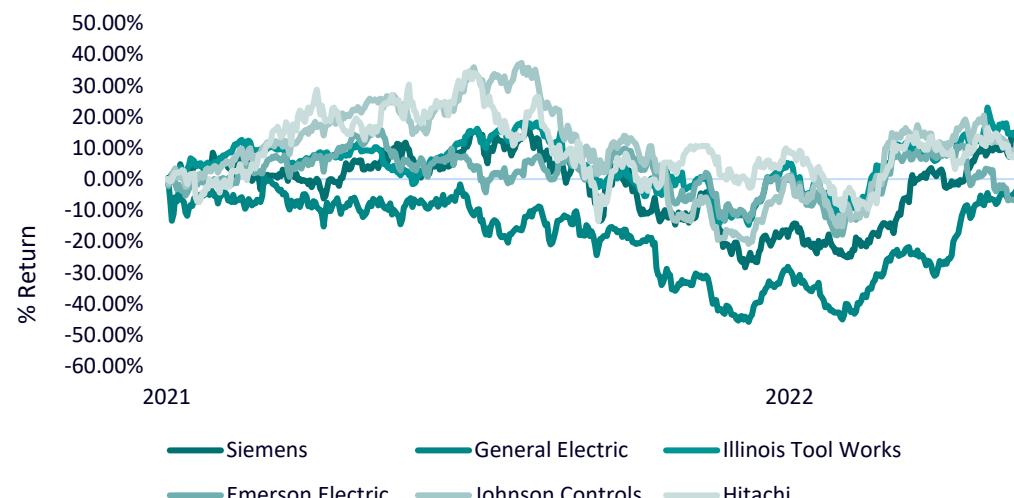
Comparable companies by market capitalization



Price/Earnings of companies comparable to Siemens



2-Year global industrials comparative returns



Source: (Annual Report (Siemens, 2022)), (Bloomberg, 2023)

	Two-year return	One-year return
SIEMENS	12.13%	27.00%
GE	(1.63%)	26.56%
ITW	11.03%	16.43%
HITACHI	36.40%	50.92%
EMERSON	7.25%	(8.59%)
Johnson Controls	8.07%	8.21%

Premium company at a not-so-premium price

- Although Siemens trades 4x above the sector median PE ratio, it is still a storied, diverse, and multinational corporation

Comparative returns

- On a three-year basis, Siemens outperformed both the DAX index and the rest of its capital goods competitors (ex-Asia)

Siemens AG: Economies of scale

- Siemens AG towers over its closest U.S. comp, General Electric, by roughly \$30Bn
- However, Siemens PE ratio is only one turn above General Electrics PE

European Natural Gas Overview

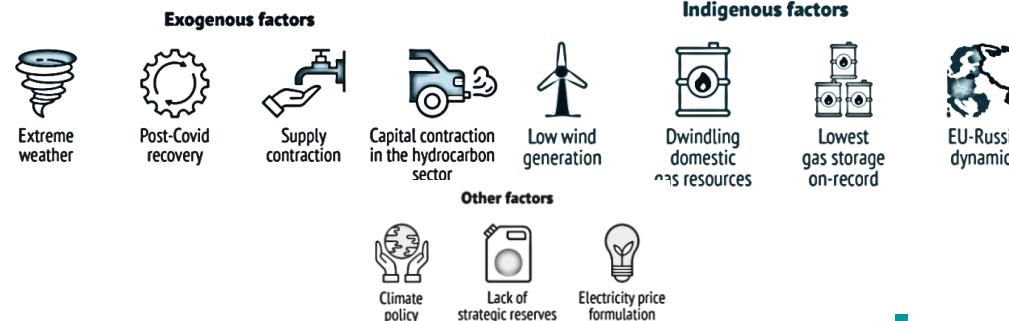
SIEMENS

Europe spared by mild winter, energy independence is still in question

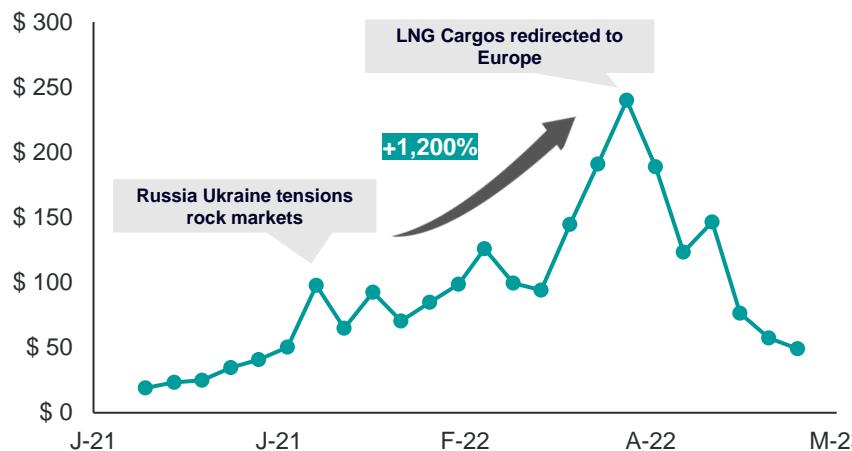
European energy infrastructure exposed

- While Europe enjoyed a mild winter, gas prices have soared to all time highs, exposing how weak Europe's gas infrastructure is
- This has shown evidence for the need to invest in clean energy solutions

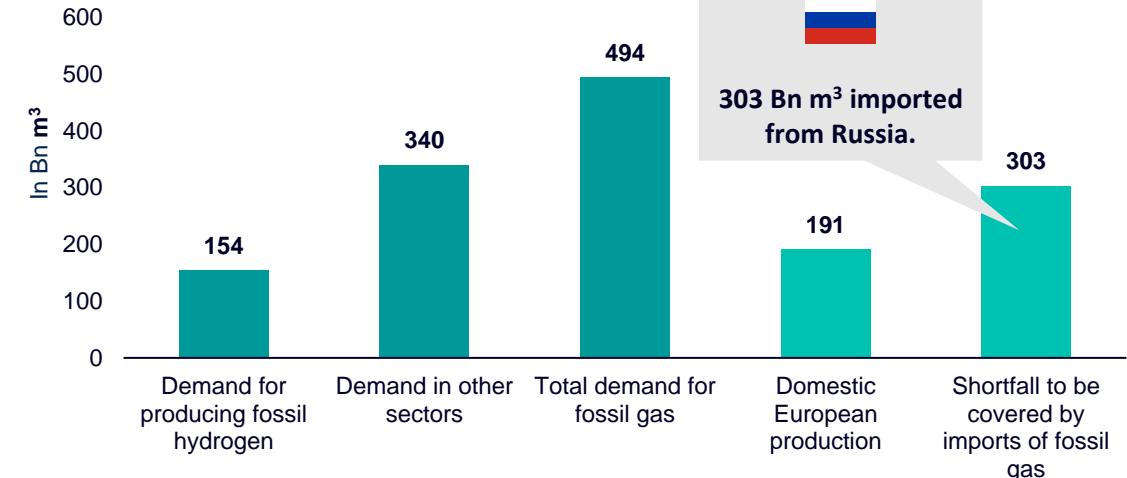
Europe's energy supply crunch has many facets



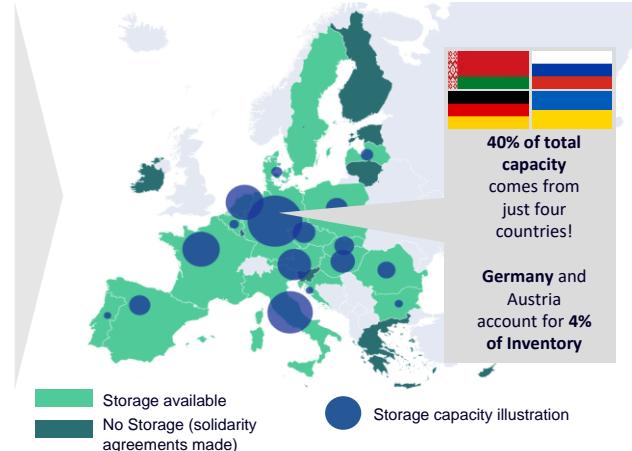
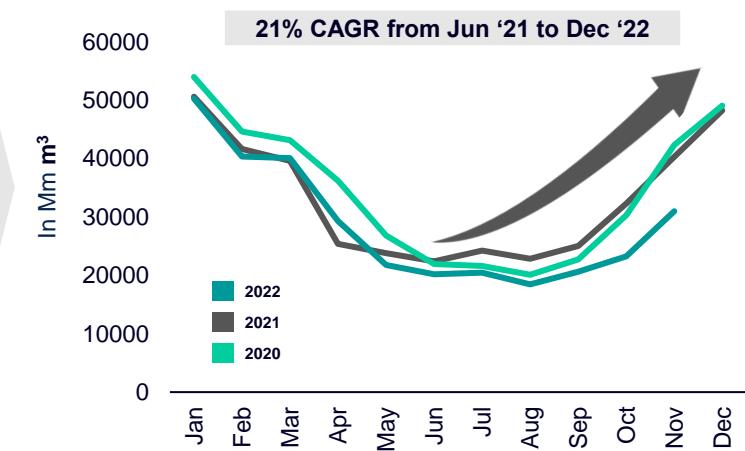
Dutch TTF at all time highs...



Natural gas demand increases in low carbon scenario...



...while demand for gas continues to rise...
...and the infrastructure isn't strong enough to fully support it



Siemens' Strategic Direction

SIEMENS

Emphasis on building a focused company, centered around automation technology

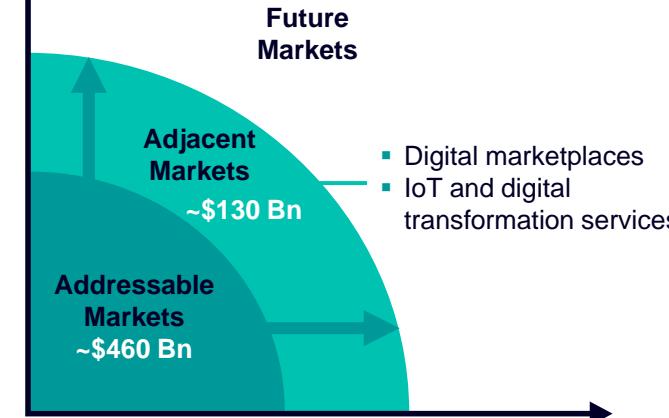
Both Siemens' core and digital businesses reinforce one another

- Siemens' **Digital Industries** segments business model transitioned towards cloud-enabled SaaS. Transitioning to SaaS is assumed to drive predictable growth while remaining focused on core competencies
- The company invested roughly \$10Bn in software companies to enhance their technology stack

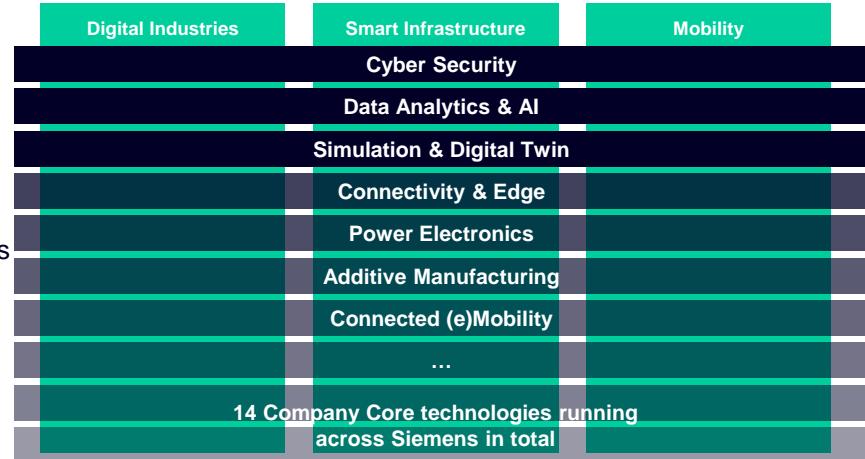
Digital business growth



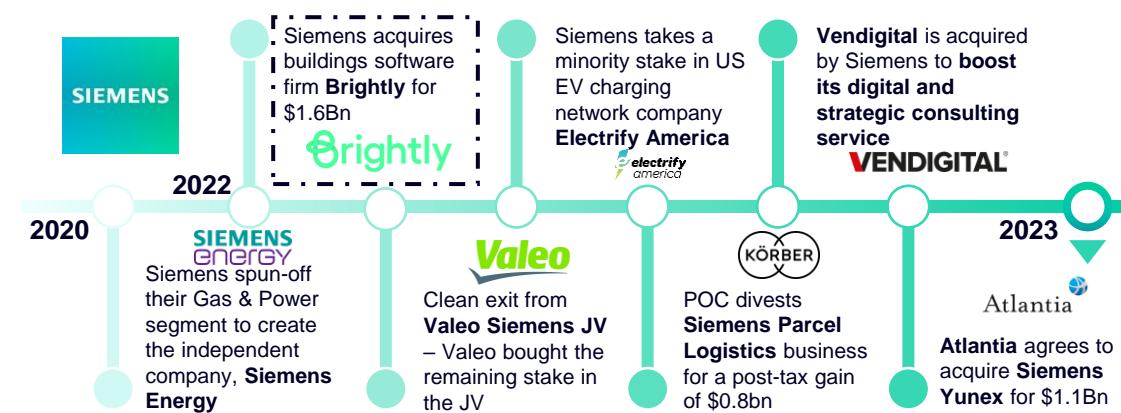
Addressable market growth with attractive adjacent markets



Core technologies being leveraged across the business



The shift toward a tech focused business through investments and divestments...



...which plays directly into Siemens' digital transformation

Industry Infrastructure Mobility Healthcare

 60% of manufacturing tasks can be automated, improving productivity, quality, and safety	 80% of lifecycle costs can arise from operations. Digital technologies can unlock savings potential of up to 20%	 20% potential increase in transport capacity through digital signaling technology without building additional infrastructure	 50% of stroke-related costs could be reduced by AI and digital-twin technologies
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Source: (Capital Markets Day (Siemens, 2021)), (Bloomberg, 2023)

Note: Expressed in USD with a conversion rate of 0.94 as of 2/20/23



Company Overview

SIEMENS

Overview

Vestas

Overview

SIEMENS
+
Vestas

Strategic Fit

Vestas Overview

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An industry leader in renewable solutions with manufacturing, installment, and service in wind turbine operation across the globe

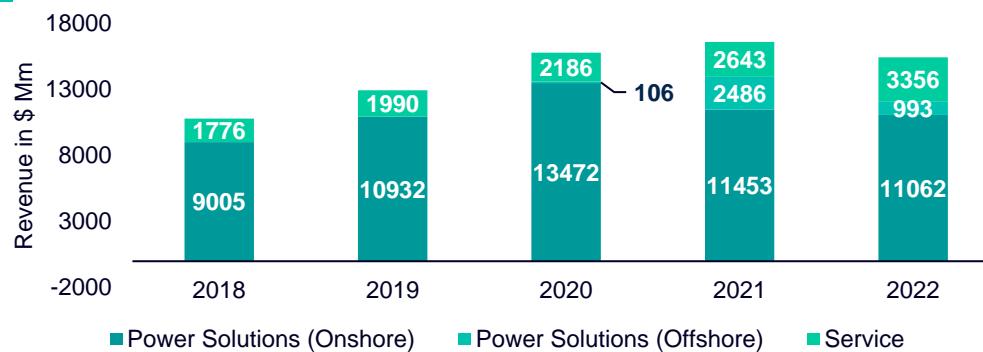
Company overview

- Vestas (VWS-DK), is an industry leader in sustainability at the forefront of green energy transformation with an emphasis on the manufacturing, installment, and service of **onshore and offshore wind turbines**
- Founded in 1945 by Peder Hansen, Vestas is currently headquartered in **Aarhus Denmark** with offices spanning across 24 countries internationally
- With **154 GW of wind turbines spread across 85 countries**, Vestas has installed **more wind power than any other competitor**

Vestas' ten-year journey



Breakout of revenue generating segments



Source: (Annual Report (Vestas, 2022), (Bloomberg, 2023), (Statista, 2023))

Segment breakdown

Core competencies



Onshore Wind

- With more than 40 years of experience, Vestas is the global leader in onshore wind with 164 GW of installed capacity and a suite of unique products



Offshore Wind

- With 25+ years of experience, and re-entry into the market in 2020, Vestas' turbines are designed to deliver exceptional performance in all conditions across the globe leading in both fixed-bottom and floating offshore wind
- Track record of +8 GW and +1,500 turbines for 46 projects covering markets across Europe



Service

- Provides onshore and offshore service solutions for both Vestas and non-Vestas turbines globally and services a portfolio of more than 140 GW, the largest fleet of wind turbines in the world, 55,000 turbines, across 74 countries by 10,000 dedicated technicians



Development – Non-revenue producing core competency

- Maximizing wind resources through intensive and thorough development of new wind products with a 30+ GW project pipelines to accelerate energy transition (covers the phase of creating a power plant from initial planning through installation with key activities being securing land and permitting, designing sites and project offtake agreements, and ensuring grid connections)

Enablers



Service Adjacencies

- Acquisitions and new revenue pipelines to accelerate service growth



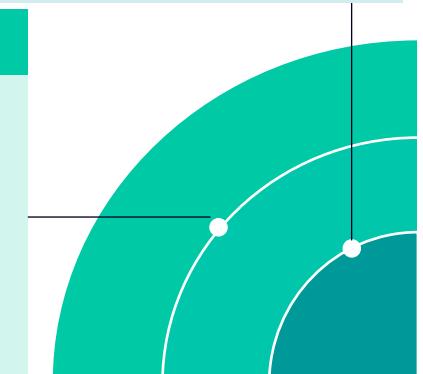
Power-to-X

- Indirect electrification to accelerate both onshore and offshore growth



Vestas Ventures

- Accessing promising technologies to optimize wind turbine technology



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Vestas Product Overview

SIEMENS

Vestas offer a wide array of onshore, offshore, and service solutions

Onshore offerings

EnVentus™ based variants are designed with global applicability in mind. As part of the suite of Vestas offerings, EnVentus™ turbines offer a **wide range of standard hub heights and modes of operation** that can be combined with **an extensive list of technology options** to create customized solutions to suit the needs of each unique project



- Enventus Platform
- 4 MW Platform
- 2 MW Platform



Offshore offerings

Vestas offshore turbine platforms are designed with maximum reliability, ease of installation and servicing, and **world-class performance** in mind. Offshore turbines are **available for both high and low wind geographies**, including IEC T-class rating to protect against even the harshest typhoon conditions



- V236-15.0 MW
- V174-9.5 MW
- V164-10 MW



Service offerings

Vestas now service more than **55,000 wind turbines** and more than **10,000 dedicated service technicians** across 74 countries work committedly to maintain and support the biggest wind turbine fleet in the world



- Maintenance
- Parts & Repair
- Fleet Optimization



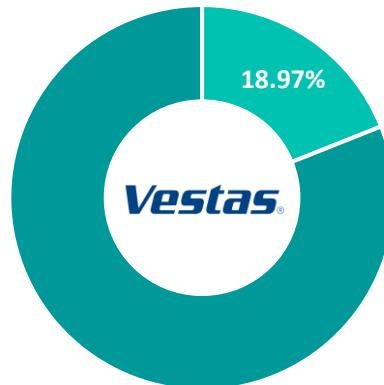
Source: (Annual Report (Vestas, 2022), (FactSet, 2023))

Note: Expressed in USD with a conversion rate of 0.94 as of 2/20/23

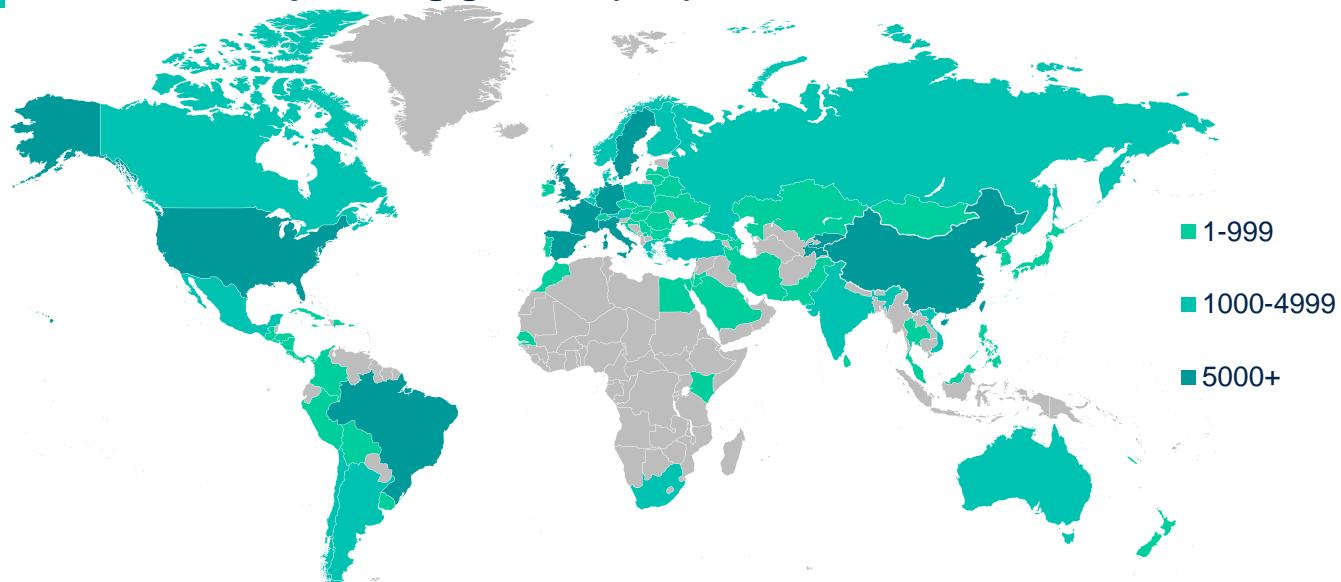
Summary of Vestas' presence in the wind turbine market

- The global leader in wind energy service solutions with more than 144 GW under service, which is equivalent to almost 56,000 turbines
- In 2022, Vestas delivered 3,300 turbines in 21 different countries
- Remains the leader in onshore wind with 164 GW of installed capacity across the Americas, Asia Pacific, and EMEA
- Expansion focus into offshore turbine production with strong expectations of USA and South Korea presence and a projected CAGR of 35-40%
- Re-entered the offshore wind power segment in 2020 with expectations for accelerated growth after 2024
- Primary competitors include GE Renewable Energy, Siemens Gamesa Renewable Energy, and Goldwind

Market share

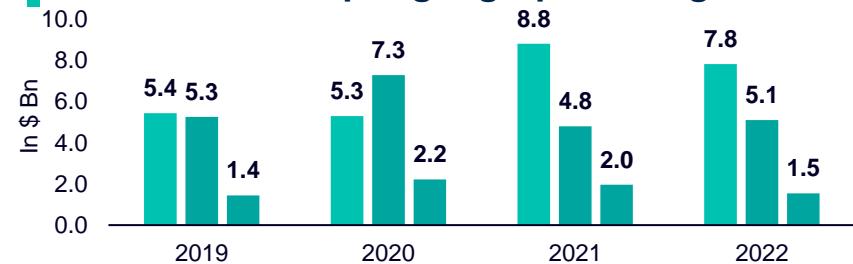


The Vestas footprint in gigawatts (GW)



Source: (Annual Report (Vestas, 2022)), (Bloomberg NEF, 2023), (Global Data, 2022), (Djunisic, 2022)

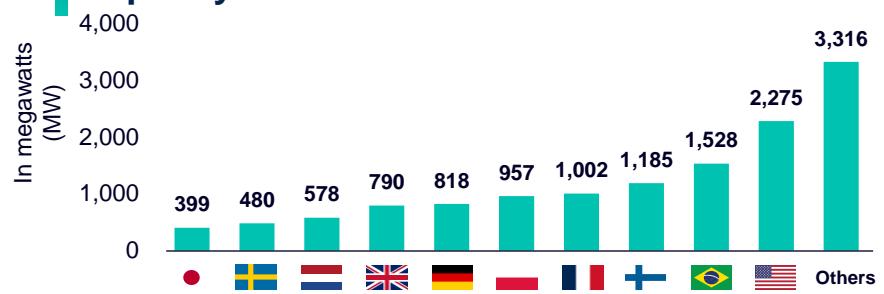
Vestas' revenue per geographical region



Leading wind turbine producers by gigawatts(GW)



Capacity of delivered Vestas turbines



Company Strategy to Further Expand into Offshore

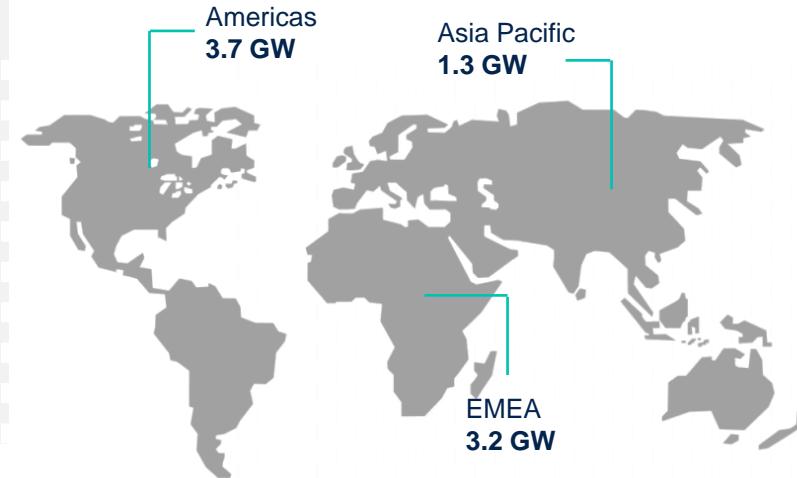
SIEMENS

With demand for onshore turbines facing headwinds, Vestas seeks to focus primarily on expansion into offshore in the coming years

Future emphasis on energy resiliency and transition to offshore wind

- Vestas is prominently positioned in Onshore as an industry leader and **seeks to expand** its offshore business with the goal to achieve revenue in Offshore of **+3Bn by 2025** with an EBIT margin on par with Onshore
- Offshore remains the primary focus in **10 key markets which account for 80% of installment**. It is being expanded through the development of floating solutions which allow deep sea penetration. **Vestas plans to heighten partnership with offshore partners** and secure orders for their V236-15.0 MW turbine

Building a leading global position in offshore through V236 turbine expansion



Global wind market capacity forecast in gigawatts (GW)



Vestas' expectations for growth...

Onshore
Market Expectations New Installments (GW)
CAGR:
↑ 8-10%

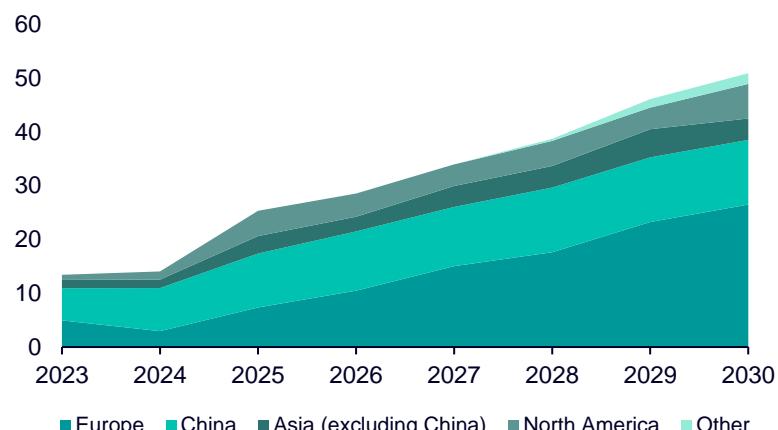
Offshore
Market Expectations New Installments (GW)
CAGR:
↑ 35-40%

Service
Market Expectations New Installments (GW)
CAGR:
↑ 8-10%

Development
Vestas' Expectations New Installments (GW)
CAGR:
>10%

- Foundation in place**
- Goal in Development to outgrow the total onshore market in firm order intake
 - Own developed projects to further leverage side deals

Projected offshore wind installation growth by 2030 in gigawatts (GW)



Source: (Annual Report (Vestas, 2022), (GWEC, 2022, Statista), (Bloomberg, 2023))

Key Challenges to Vestas' Turbine Development Projects

SIEMENS

Development of wind projects could face headwinds due to development barriers and the proliferation of other renewable energy sources

Scarcity of buildable land posing problems for developers looking to add onshore projects

- The loftiness country's targets create extremely tight margins of error for developers of these projects
- The decision for Vestas to focus on offshore seems more forced than a strategic move due to rising land costs, longer development times, and higher growth offshore

Technical constraints

- Slope of build site must meet specifications
- Footprint of existing installations is large

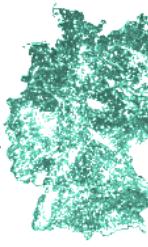
Regulatory constraints

- Areas of the country are strictly protected such as national parks, wilderness, & natural monument

Environmental constraints

- Key biodiversity areas
- Loosely protected land pertaining to natural resources

50%
Potential land for development

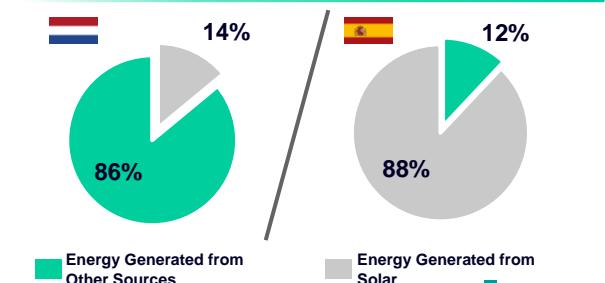
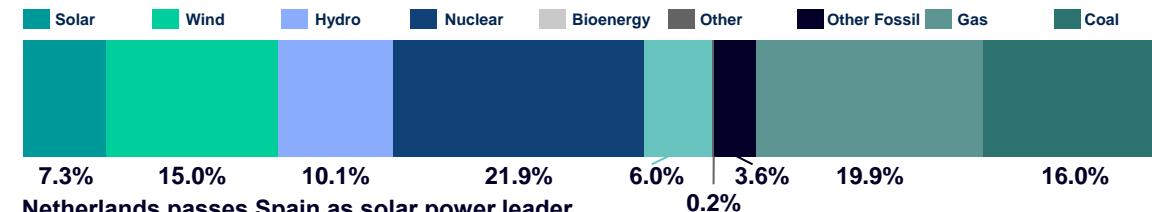


To meet German targets,
4% - 6% of land
must be covered

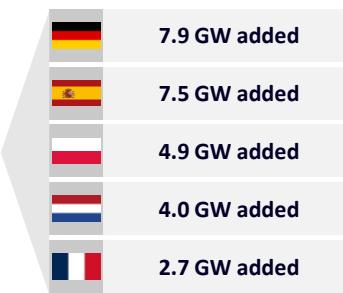
9%
Land available less constraints



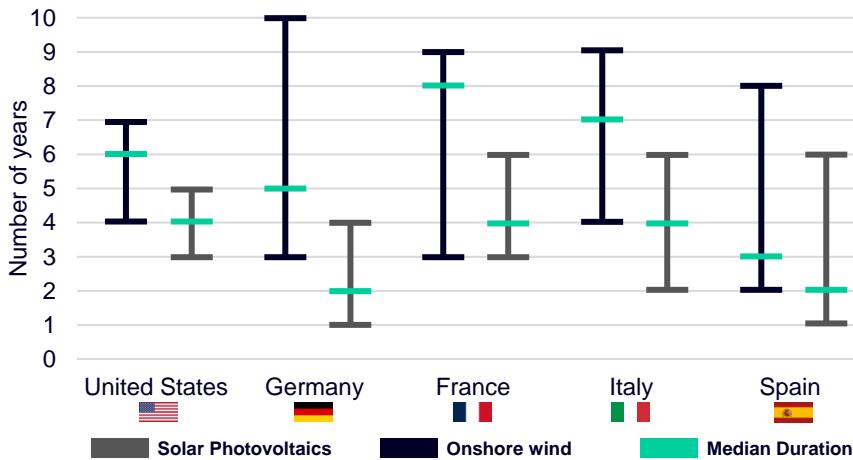
European Union electricity mix



Top five countries in solar capacity additions in 2022



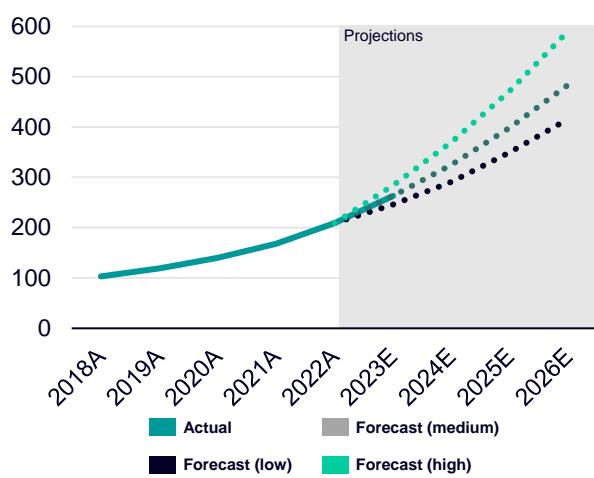
Onshore wind projects take longer to build...



...and as solar installation costs decline...



...capacity in the EU could triple by '26



Source: (Bloomberg NEF, 2022), (Christakou, 2022), (Council of the European Union, 2022), (EuroStat, 2022), (JPMorgan, 2022), (IRENA (2), 2022), (Ember, 2023)



Company Overview

SIEMENS

Overview

Vestas

Overview

SIEMENS
+
Vestas

Strategic Fit

Strategic Fit Between Siemens and Vestas

The combined company providing a wide range of digitally connected products with access to financing

SIEMENS

1

Product Contribution

Smart Infrastructure

Offers products and services to support a sustainable transition from fossil to renewable energy sources as well as a transition to smarter, more sustainable buildings and communities

- Siemens wind solutions portfolio **pairs well with Vestas' infrastructure and offers industry-leading technology** while elongating product lifecycles
- By acquiring Vestas, Siemens **would add a top player in the wind turbine industry**, establishing a tight grip on the market
- Vestas' high growth GW installment would **allow Siemens to continue expansion into untapped markets** and gain recurrent revenue from Vestas' prominent customer base
- **Siemens gains the world's largest wind supply chain**

2

Greater Access to Capital

Financial Services (SFS)

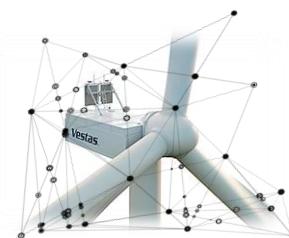
Provides financing solutions for Siemens' customers in the form of debt and equity investments. Supports its customer base with leasing, lending, working capital and structured financing solutions, as well as equipment finance

- Vestas can leverage the expertise of Siemens Financial Services through a wide array of debt, equity, and bespoke financing solutions to **expand into the burgeoning North American market quicker**
- Vestas' EBIT has historically faced challenges, but could be resolved by a **capital infusion from Siemens in supply chain optimization**, warranty provisions and labor/execution investments
- **North American offshore has a plethora of tailwinds**

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IoT Integration



Vestas®

Source: (Annual Report (Siemens, 2022))

Vestas Strategic Fit | Product Contribution

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Siemens wind solutions portfolio couples well with Vestas' products

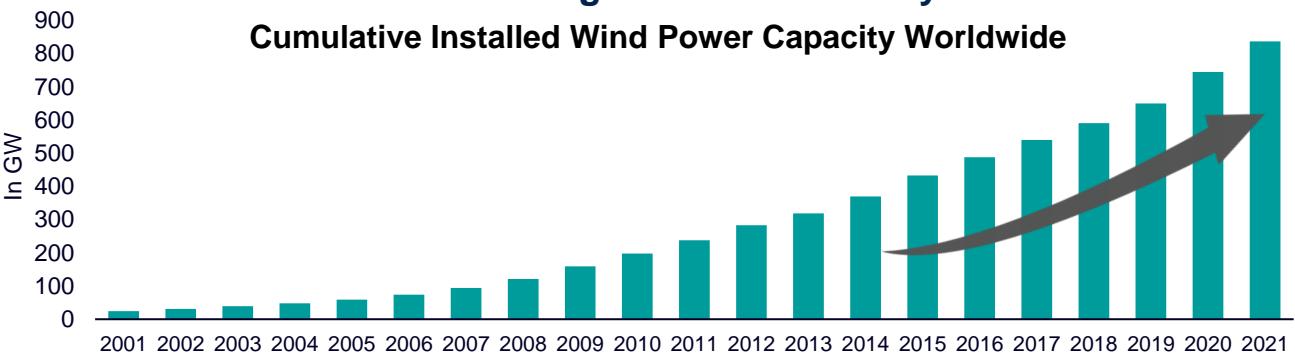
Siemens can support Vestas' infrastructure through technological solutions

SIEMENS

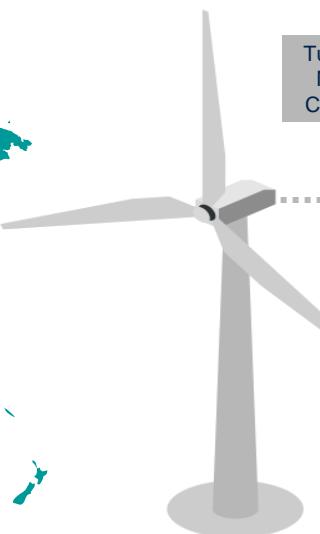
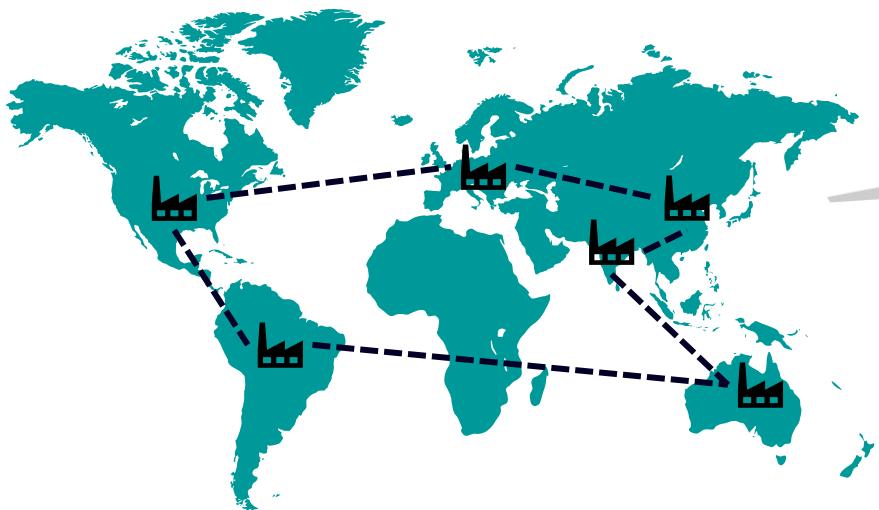
Vestas

- Siemens offers a comprehensive portfolio of advanced technological solutions applicable to Vestas' infrastructure
- The two companies' capabilities and products compliment each other nicely
- Siemens can capitalize on Vestas' growing installations to increase revenue and market share in their wind solutions

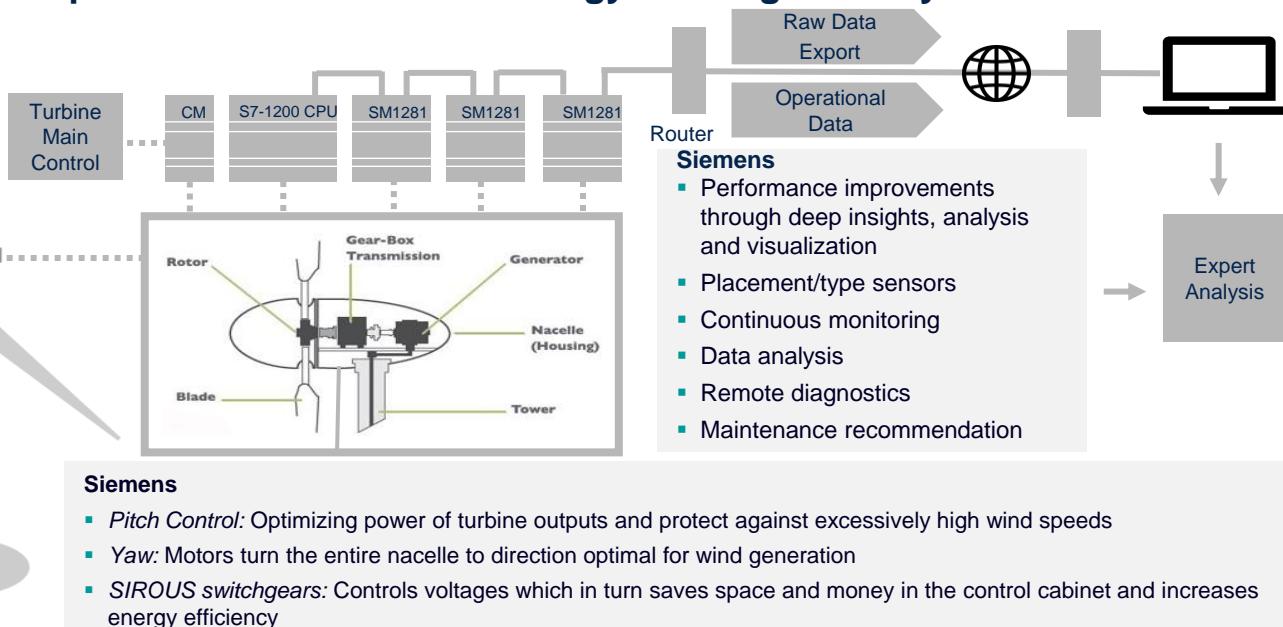
Vestas is a promising opportunity for Siemens to optimally employ their wind solutions in the global wind industry



Acquiring the world's largest wind supply chain



Siemens provides Vestas the technology to elongate lifecycles



Source: (GWEC, 2022, Statista), (Annual Report (Siemens, 2022), (Annual Report (Vestas, 2022), (Siemens, 2023), (Bloomberg, 2023)

Vestas Strategic Fit | Greater Access to Growth Capital

Siemens Finance Services gives Vestas the capital they need to grow their offshore expansion

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Dedicated financing arm...

SIEMENS

Siemens Financial Services

Vestas

...using Siemens Financial Services capabilities...

Debt



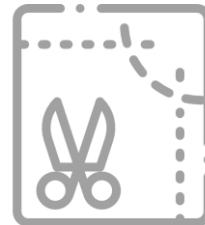
- Siemens offers debt financing for Capex, expansion, and acquisition
- Siemens Finance Services committed \$100mm of multilender ABL revolver to AK steel to **increase flexibility and earnings**

Equity



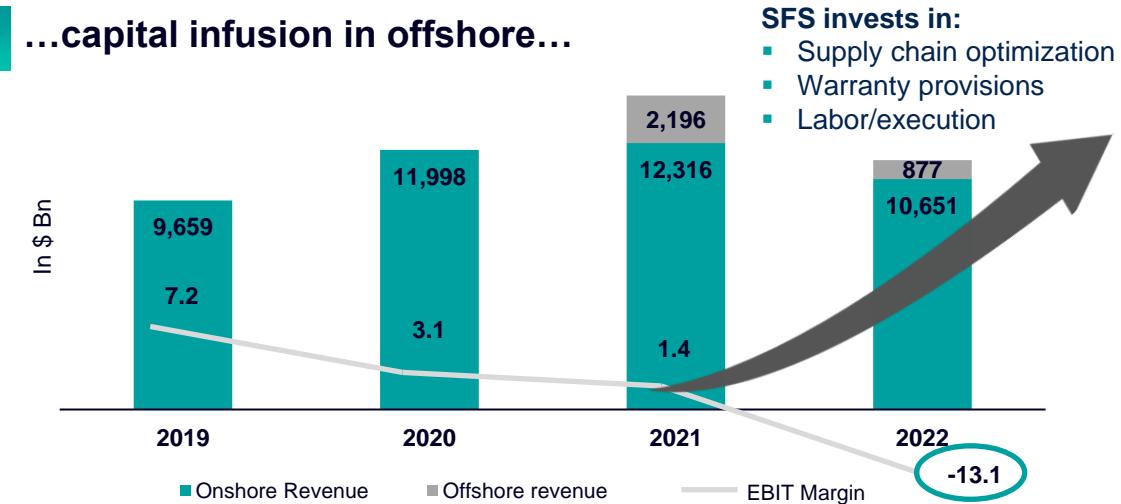
- Siemens can also invest in equity stakes of **up-and-coming sustainability ventures**
- Siemens invested an equity stake into an Ohio based vertical farming company which needed **capital for growth and implementation of proven technology**

Bespoke



- Senior secured debt
- Revolvers
- Term loans A & B
- Delayed draw facilities
- **Equipment finance and leasing**
- **Asset-based lending**
- Specialty finance (structured products and equity co-investments)

...capital infusion in offshore...



SFS invests in:

- Supply chain optimization
- Warranty provisions
- Labor/execution

... to capture North American growth opportunities



+3 GW



Vestas global development pipeline

- President Biden **considering auction of Gulf of Mexico for offshore wind production**
- Through the IRA, floating offshore wind costs may be cut 70% by 2035
- **Two-thirds of U.S. offshore wind resources are in deepwater areas**, where conventional turbines aren't an option

Financial Overview | Comps

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Vestas Potential Peer Groups

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The peer group for Vestas encompasses turbine manufacturers, wind field services and management, and wind developers

Turbine manufacturers



MINGYANG SMART ENERGY
明阳智能

INOXWIND
Energizing INDIA

SUZLON



Logic: Vestas' largest revenue segment is turbine manufacturing and is the largest manufacturer in the space

Wind field services

EVK
Enser Versicherungskontor

Deutsche Windtechnik
Service

energiequelle
TOMORROW'S ENERGY.

INDUSTRIE
HOLDING
B&C

Logic: Vestas' offers limited servicing capabilities to the wind industry, demand for services will only grow with the proliferation of wind power

Vestas®

Wind developers

国家能源集团
CHN ENERGY

IBERDROLA

Ørsted

CGN

Invenergy

Logic: Vestas has only developed wind fields in the United States, the above companies offer opportunity to expand their development globally

Source: (Bloomberg, 2023)

Comparable Company Selection

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Selection of Vestas' peer group was determined via examining comparable companies' relevance to Vestas' brand as well as revenue and cost drivers

Market size	Market size CAGR	Brand relevance	Revenue drivers	Cost drivers	Decision	
Vestas	-	6.3% ('22-'30)	NM	<ul style="list-style-type: none"> ■ Decarbonization investments ■ Alternative energy demand ■ Offshore expansion ■ Development 	<ul style="list-style-type: none"> ■ Labor availability ■ Supply chain drags ■ Cheap natural gas ■ Unfavorable legislation 	NM
Manufacturing	\$136.2Bn ('23e)	9.4% ('22-'30)		<ul style="list-style-type: none"> ■ Decarbonization investments ■ Alternative energy demand ■ Offshore expansion ■ Development 	<ul style="list-style-type: none"> ■ Labor availability ■ Supply chain drags ■ Cheap natural gas ■ Unfavorable legislation 	
Development	\$62.1Bn ('23e)	9.3% ('20-'27)		<ul style="list-style-type: none"> ■ Decarbonization investments ■ Alternative energy demand ■ Offshore expansion ■ Development 	<ul style="list-style-type: none"> ■ Labor availability ■ Supply chain drags ■ Cheap natural gas ■ Unfavorable legislation 	
Services	\$36.2Bn ('23e)	8.4% ('22-'30)		<ul style="list-style-type: none"> ■ Decarbonization investments ■ Alternative energy demand ■ Offshore expansion ■ Development 	<ul style="list-style-type: none"> ■ Labor availability ■ Supply chain drags ■ Cheap natural gas ■ Unfavorable legislation 	

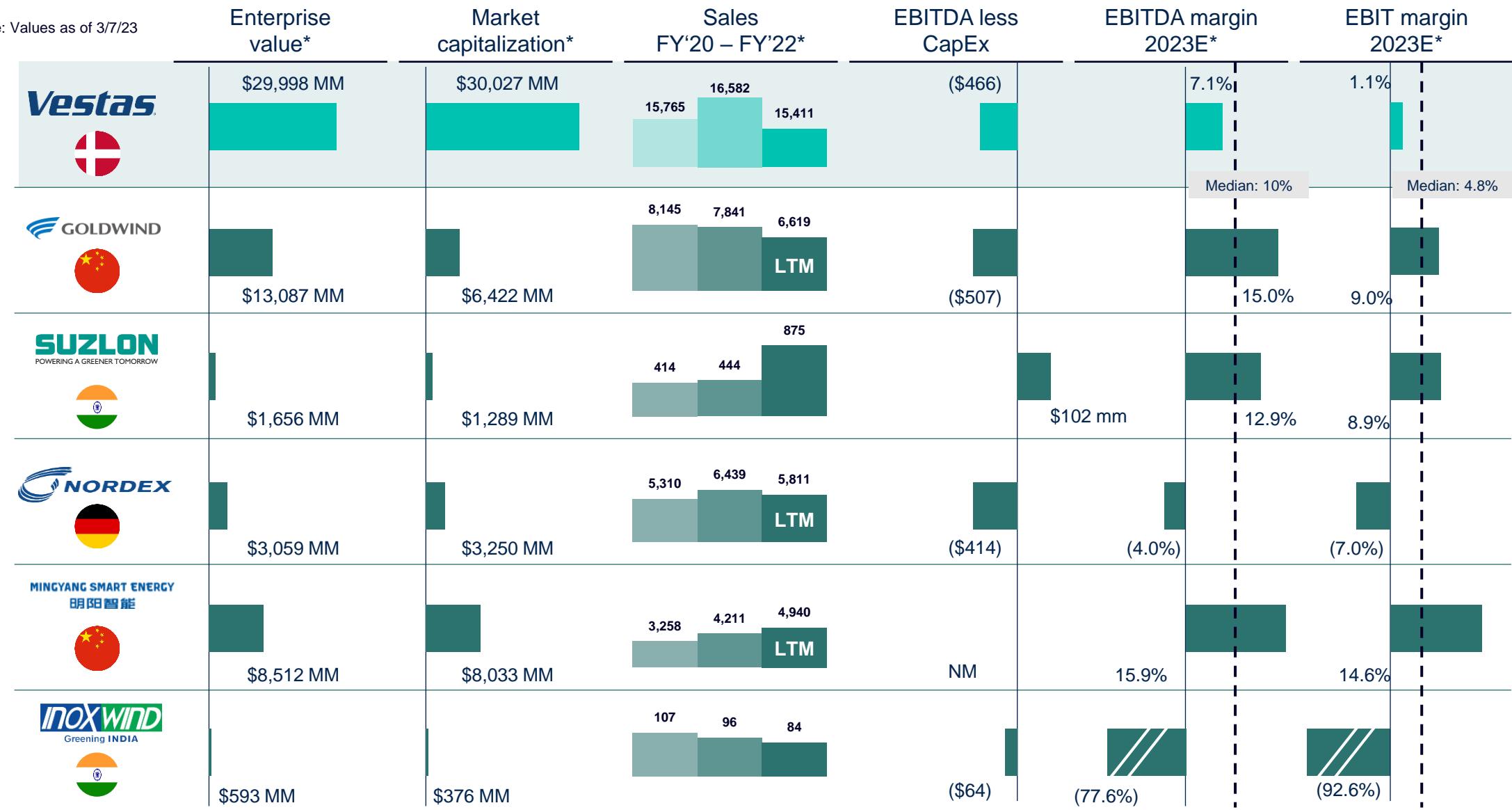
Source: (Annual Report (Vestas, 2022)), (Bloomberg, 2023), (Deloitte, 2022)

Peer Group Statistical Analysis



Historical enterprise value, market cap, sales, and projections for EBITDA, EBIT, and net income margin for the upcoming FY

*Note: Values as of 3/7/23

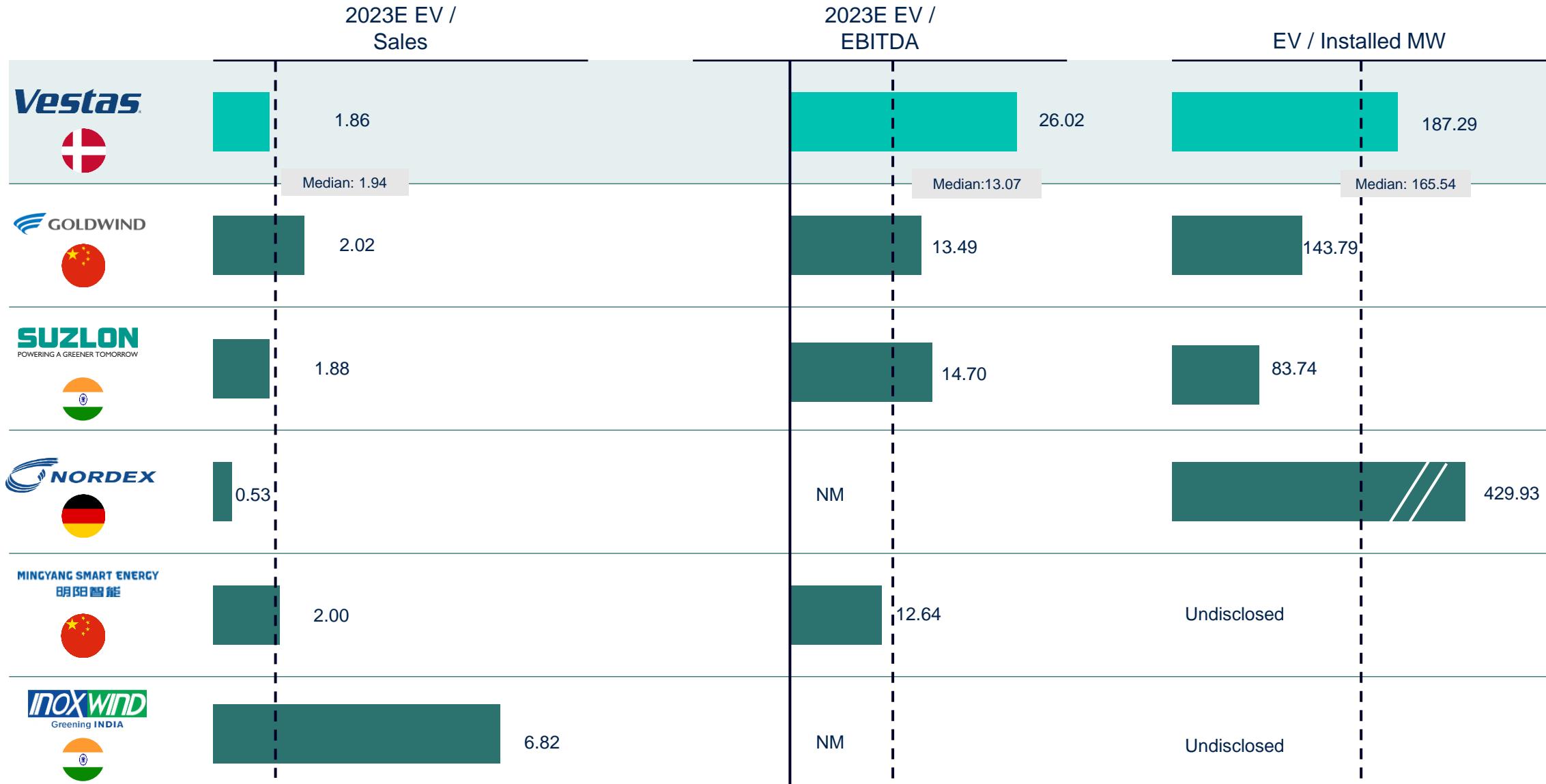


Source: (Bloomberg, 2023), (FactSet, 2023)

Peer Group Trading Multiples

SIEMENS

For leading providers of wind solutions

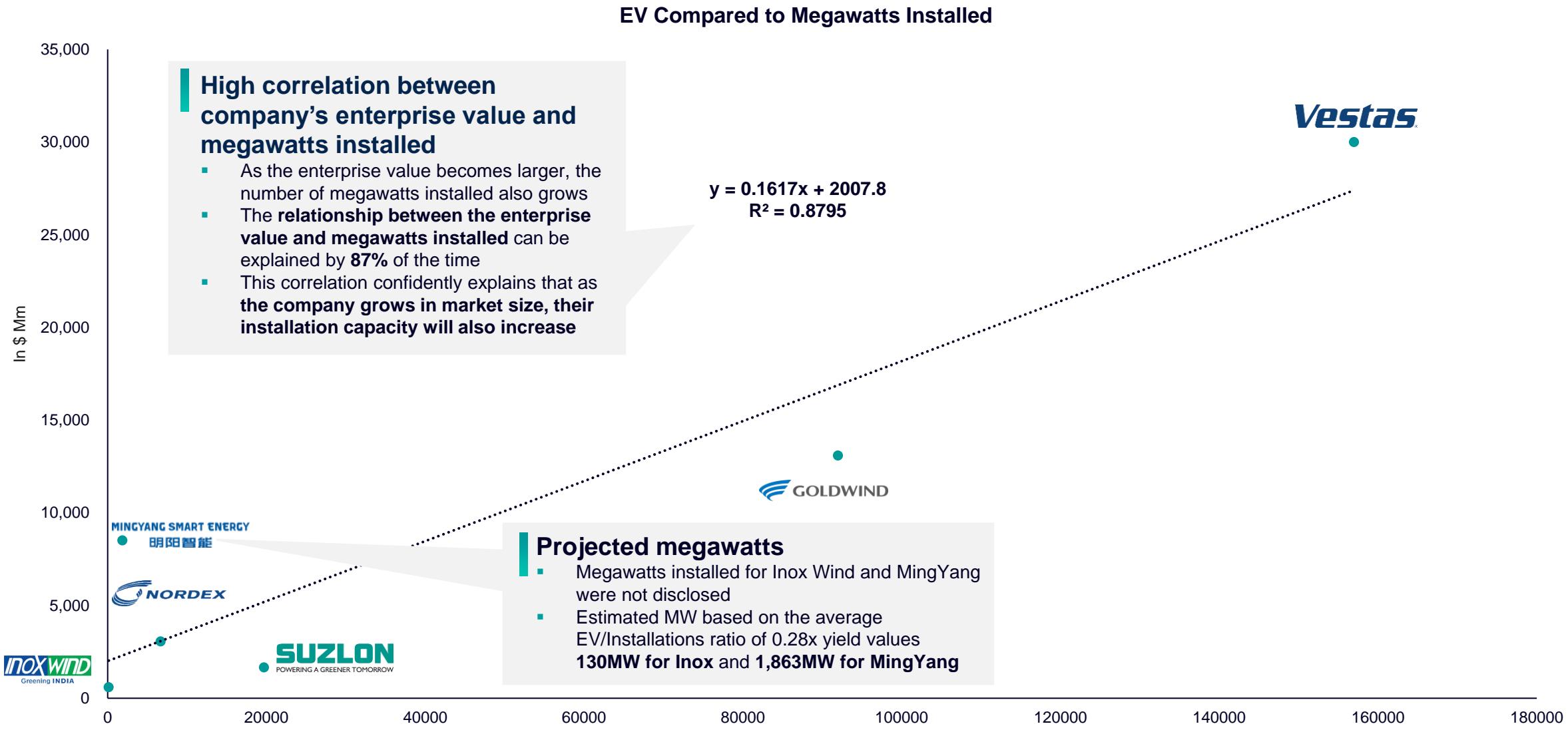


Source: (Bloomberg, 2023), (FactSet, 2023)

Enterprise Value vs. Megawatts Installed

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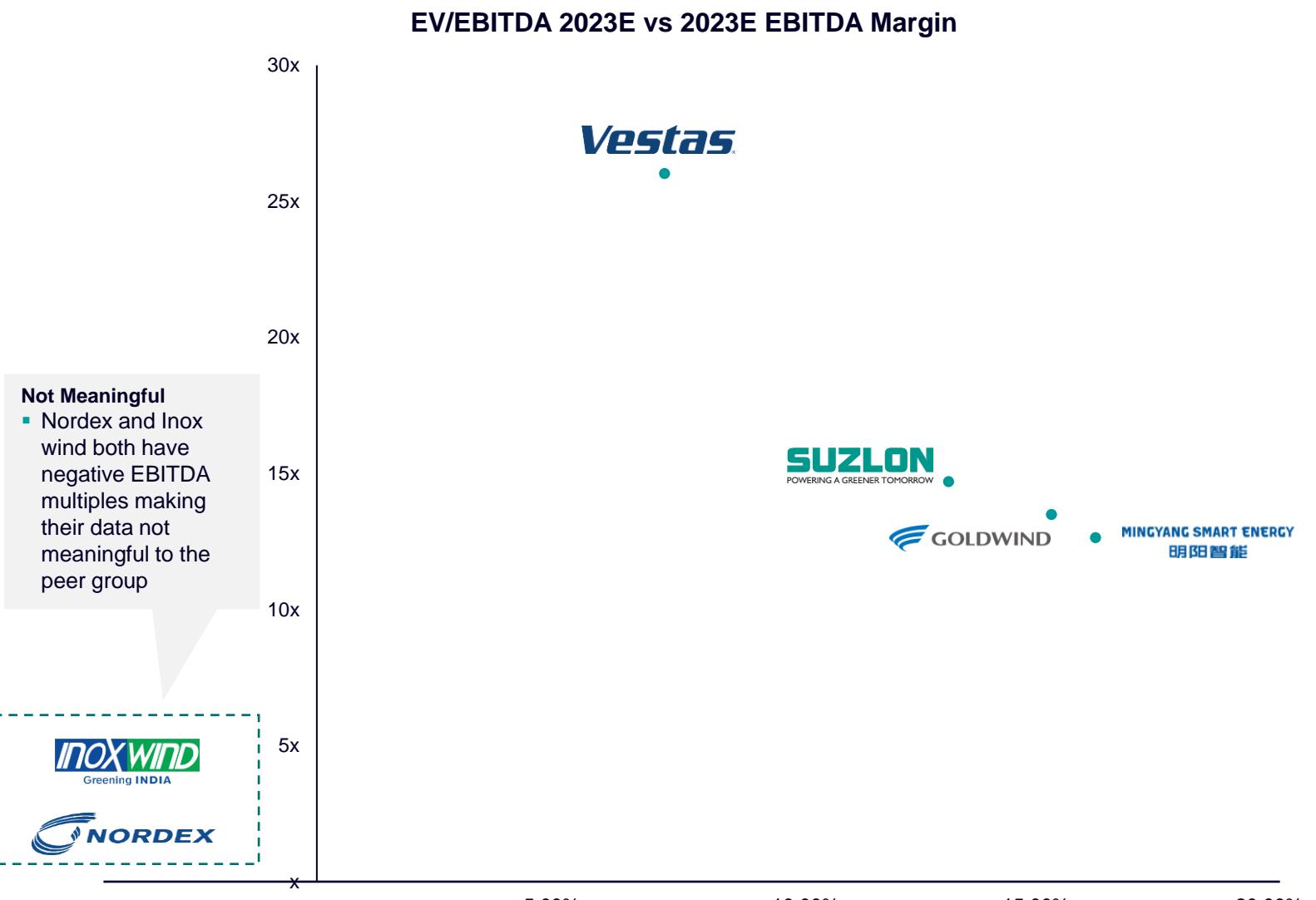
Examining corporation size compared to installment across Vestas' peer group



EV/EBITDA 2023e vs 2023 EBITDA Margin

EV/EBITDA Multiples vs. EBITDA Margin for Vestas' peer group

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Vestas

- Vestas' EV/EBITDA average was pulled down by its -53.3x multiple in FY22 driven by an EBITDA of \$-75.8 million, due to increased SG&A expenses

Suzlon

- Suzlon's COGS is highly correlated to their revenues and their EBITDA is generally very consistent with top line growth
- In FY20 when revenues declined by almost 72%, the company experienced a negative EBITDA

Nordex

- In the past 5 years, Nordex has had positive EV/EBITDA multiples with the acceptance of FY20 when EBITDA hit \$-251.6 million; EBITDA expected to be volatile in the future

Goldwind

- Goldwind has the second highest margins among its peers and has proven power in generating strong EBITDA

Inox Wind

- Inox has suffered from its operating expenses causing negative margins
- In FY22, the company saw \$84 million in revenues, offset by its \$136 million in OpEx resulting in an operating margin of -62.3% and a profit margin of -68.2%

MingYang Smart Energy

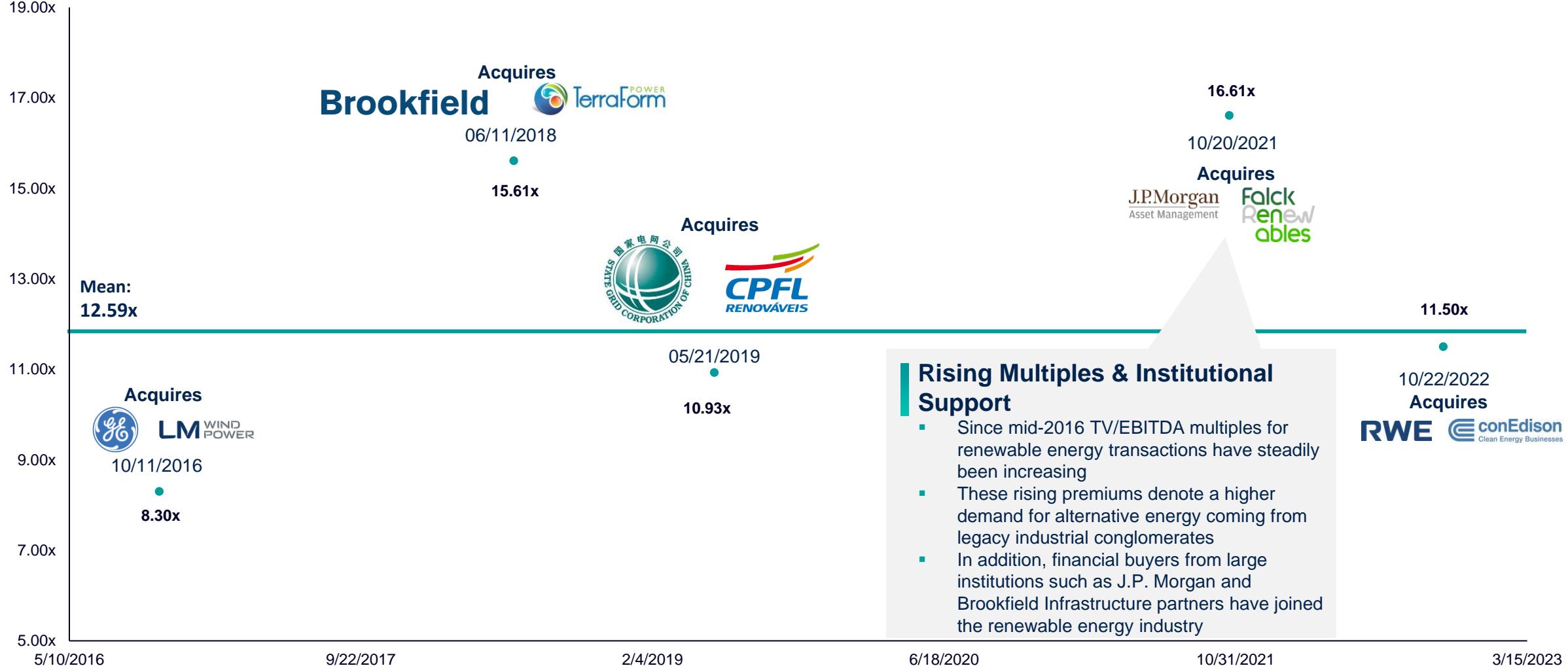
- Ming Yang maintains the strongest margins comparative to peers with a robust 15.8% EBITDA margin, high for its capitalintensive industry average

Precedent Renewables Transaction Analysis

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Renewables M&A activity has been slowly trending upward, fetching larger and larger multiples

Past Renewables Transaction TV/EBITDA



Source: (Bloomberg, 2023)

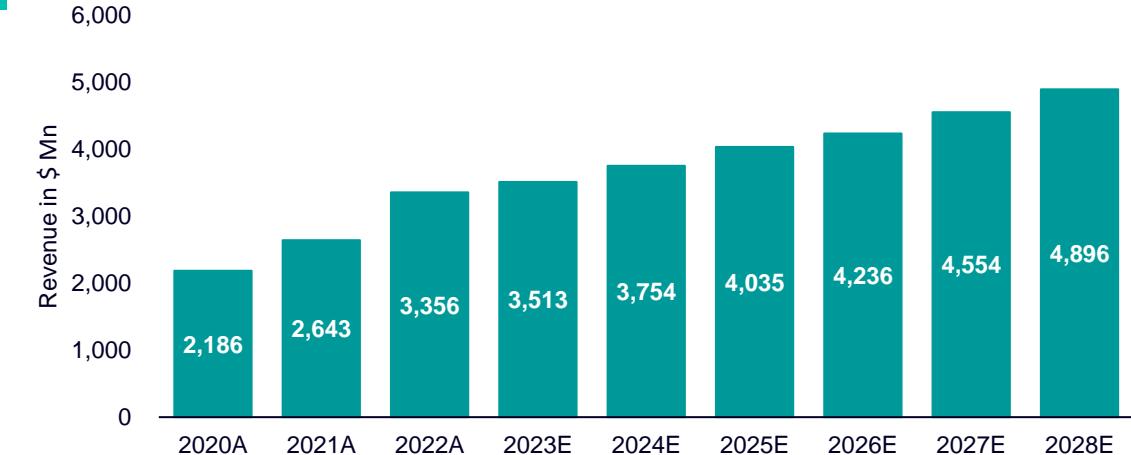
Financial Overview | Discounted Cash Flow



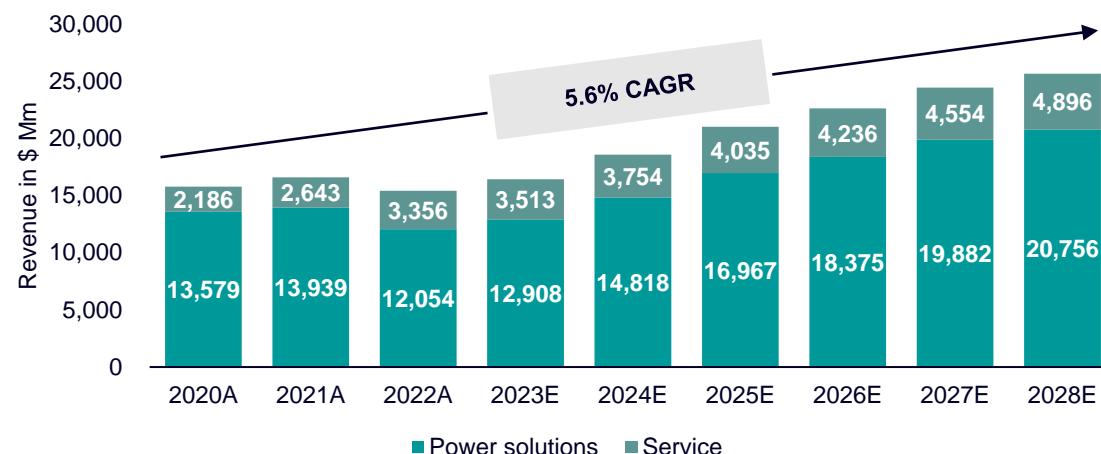
Power Solutions Revenue Breakdown by Product Offering



Service Solutions Revenue Breakdown



Total Revenue Breakdown Derived From Each Segment



Total Revenue Breakdown

- Over the course of the projected years (through FY28), revenue is **expected to grow across all segments** at a relatively consistent growth rate
- As Vestas makes the transition to focus into offshore solutions, **Onshore revenue generation levels out** into 2028 and revenue growth is attributed to the company's **offshore products**
- Over the course of the 9-year period, **onshore** and **offshore** revenues are expected to **grow at a CAGR** of **.84%** and **57.17%** respectively, for a total CAGR of **4.8%** while **service is expected to grow at a CAGR of 9.4%**

Source: (Bloomberg, 2023)

Note: Expressed in USD with a conversion rate of 0.94 as of 2/20/23

Vestas Discounted Cash Flow (1/2)

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Vestas' valuation and FCF projections

Fiscal Year Fiscal Year End Date	2021A 12/30/21	2022A 12/30/22	2023E 12/31/23	2024E 12/30/24	2025E 12/30/25	2026E 12/30/26	2027E 12/31/27	2028E 12/30/28
Revenue	15,765	16,582	16,421	18,572	21,002	22,611	24,436	25,652
% growth			(1.0%)	13.1%	13.1%	7.7%	8.1%	5.0%
Adj. EBITDA	1,514	(61)	1,714	2,464	3,404	3,401	3,631	3,736
% margin			10.4%	13.3%	16.2%	15.0%	14.9%	14.6%
Depreciation and amortization			(928)	(982)	(1,024)	(1,079)	(1,122)	(1,075)
Stock-based compensation			① (8)	(7)	(3)	(2)	(2)	(3)
EBIT	307	(1,698)	778	1,475	2,376	2,320	2,507	2,658
Tax Rate	36.2%	7.3%	23.7%	24.2%	24.0%	25.0%	25.0%	25.0%
EBIAT (NOPAT)	196	(1,574)	594	1,118	1,806	1,740	1,880	1,993
Depreciation and amortization			928	982	1,024	1,079	1,122	1,075
Working capital items:			② 253	247	442	541	576	632
Unlevered CFO	1,775	2,347	3,273	3,360	3,579	3,700		
Capital Expenditures	(591)	(669)	(756)	(814)	(880)	(923)		
Unlevered FCF	1,184	1,679	2,517	2,546	2,699	2,776		
% growth			③ 41.8%	49.9%	1.2%	6.0%	2.9%	
Discount factor			181%	281%	381%	481%	581%	681%
Assume cash flows are generated at:								
④ Midperiod adjustment factor			1.8	1.0	1.0	1.0	1.0	1.0
Present value of Unlevered FCF			1,076	1,314	1,771	1,612	1,536	1,421

Additional Commentary

- ① Stock-based compensation treated as an expense for DCF valuation
- Assumed non-cash add backs affect intrinsic valuation
- ② Current liabilities of Vestas are much larger than current assets
- Led by a large amount of contract liabilities and deferred revenue from developing wind equipment

Source: (Bloomberg, 2023)

- ③ Unlevered free cash flow growth in the first two years of the projection period is expected to grow at a high clip
- The growth is due to increased development in offshore wind projects
- ④ Midperiod adjustment factor used to calculate present value of FCF
- Assumed cash flows collected in the middle of the period as opposed to the end

Note: Expressed in USD with a conversion rate of 0.94 as of 2/20/23

Vestas Discounted Cash Flow (2/2)

Calculation of the weighted average cost of capital (WACC)

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Cost of Capital Assumptions

Pre-tax cost of debt	4.1%
Tax rate	25.0%
Risk free rate	2.9%
Beta	1.2
Market risk premium	7.1%

Cost of Debt

Pre-tax cost of debt	4.1%
Tax rate	25.0%
After-tax cost of debt	3.1%

Cost of Equity

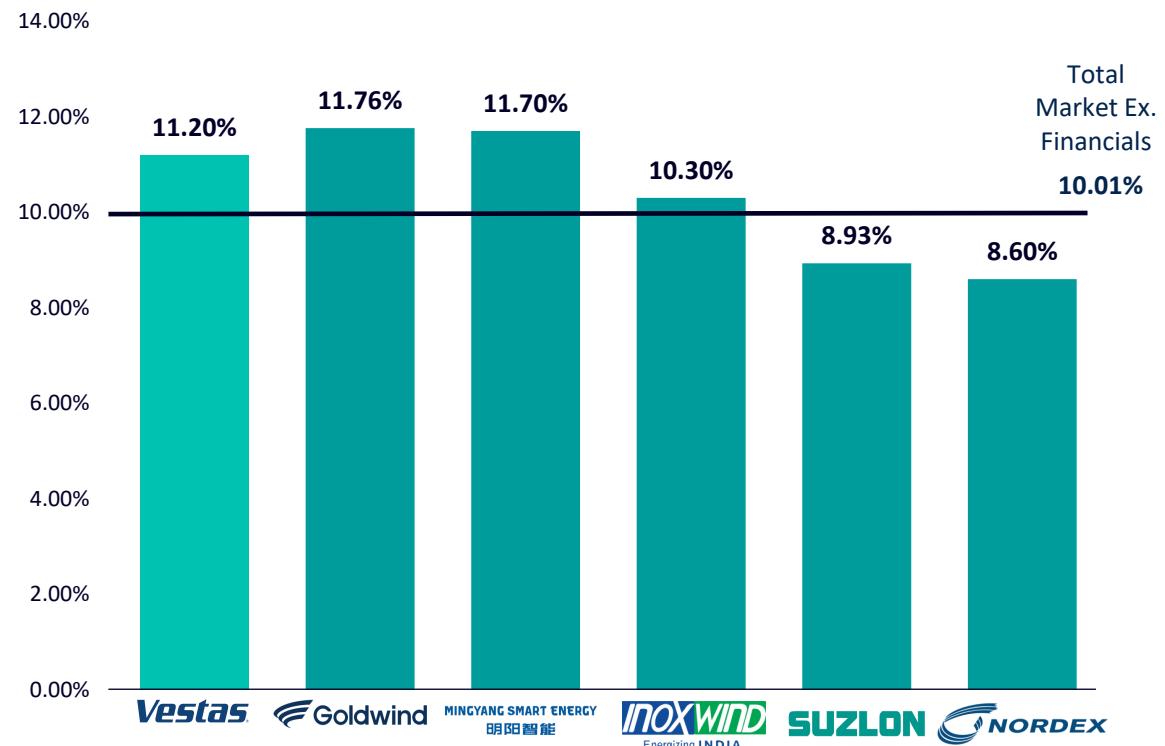
Risk free rate	2.9%
Beta	1.2
Market risk premium	7.1%
Cost of Equity	11.2%

Cost of Capital (WACC)

Capital weights	Amount	% of total
Market value of equity	29,489.6	100.0%
Market value of net debt	(211.7)	0.0%
Cost of capital (WACC)		11.2%

Source: (Bloomberg, 2023)

Selected comparable companies' average cost of capital



- Siemens cost of capital is higher than the subsector averages of the many sectors in which they operate in
- This higher cost of capital represents the complex nature of Siemens business
- By having several capital intensive operating segments Siemens would benefit by moving away from heavier industries such as wind turbine manufacturing

Note: Expressed in USD with a conversion rate of 0.94 as of 2/20/23

Vestas DCF Sensitivity Analysis

Exit multiple and perpetuity growth rate with assumptions

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Exit EBITDA Multiple Approach

Terminal year EBITDA	3,463
Terminal value EBITDA multiple	10.000x
Terminal value	34,626
Present value of terminal value	16,806
Present value of stage 1 cash flows	8,730
Enterprise value	25,535
<i>Implied TV perpetual growth rate</i>	<i>2.537%</i>

Perpetuity Approach

FCF in Last Forecast Period	2,776
FCF ^{t+1}	2,860
Long term growth rate (g)	3.0%
Terminal value	36,747
Present value of terminal value	17,835
Present value of stage 1 cash flows	8,730
Enterprise value	26,564
<i>Implied TV exit EBITDA multiple</i>	<i>10.612x</i>

- The exit EBITDA multiple was decided based upon the 2023 EV/EBITDA comps trading multiple median

- Using the Perpetuity Approach, we assumed a conservative growth rate in line with street projections

Equity value per share

		Exit EBITDA Multiple				
		6.0x	8.0x	10.0x	12.0x	14.0x
WACC:	12.2%	18.03	21.17	24.31	27.46	30.60
	11.7%	18.46	21.70	24.95	28.19	31.43
	11.2%	18.91	22.26	25.60	28.94	32.28
	10.7%	19.38	22.83	26.27	29.72	33.16
	10.2%	19.86	23.41	26.97	30.52	34.08

Source: (Bloomberg, 2023)

Equity value per share

		Long term growth rate (g):				
		1.0%	2.0%	3.0%	4.0%	5.0%
WACC:	12.2%	20.63	21.95	23.54	25.53	28.07
	11.7%	21.70	23.18	25.00	27.29	30.26
	11.2%	22.88	24.55	26.64	29.30	32.82
	10.7%	24.18	26.08	28.49	31.61	35.82
	10.2%	25.62	27.80	30.60	34.29	39.40

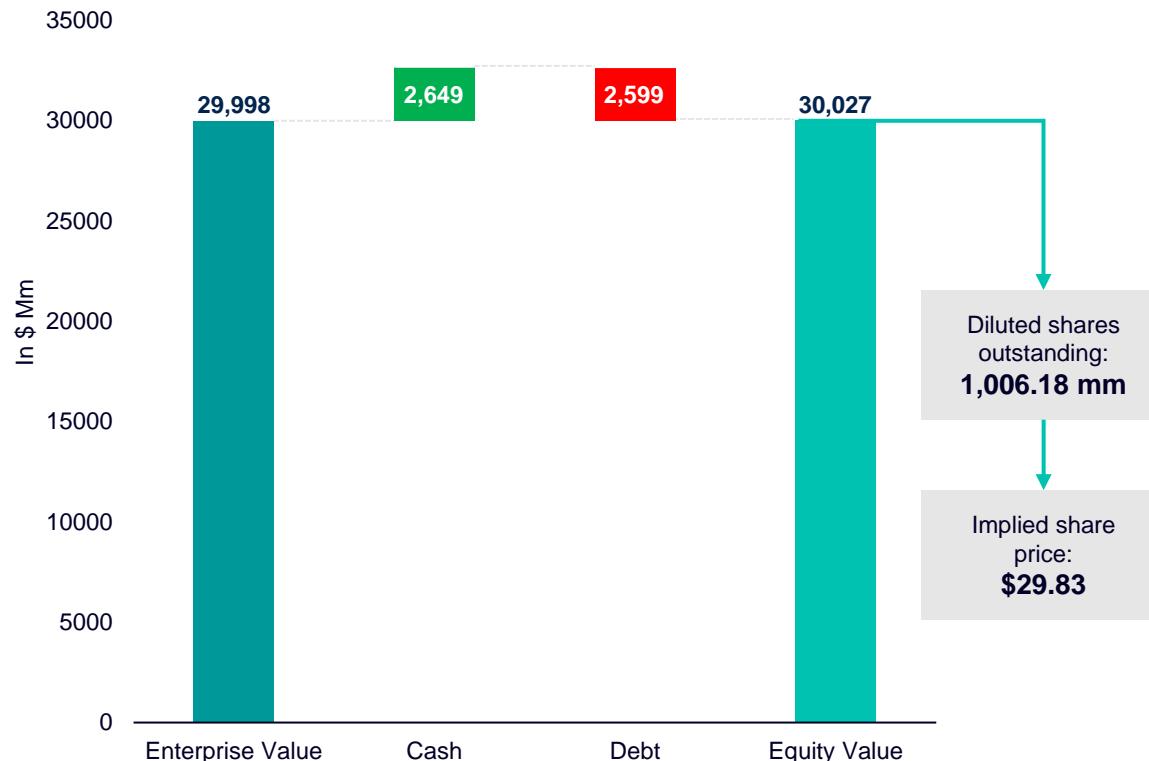
Note: Expressed in USD with a conversion rate of 0.94 as of 2/20/23

Vestas Fair Enterprise Value Determination

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Football field and enterprise value to equity value bridge showing similar per share values

Enterprise to Equity Value Bridge



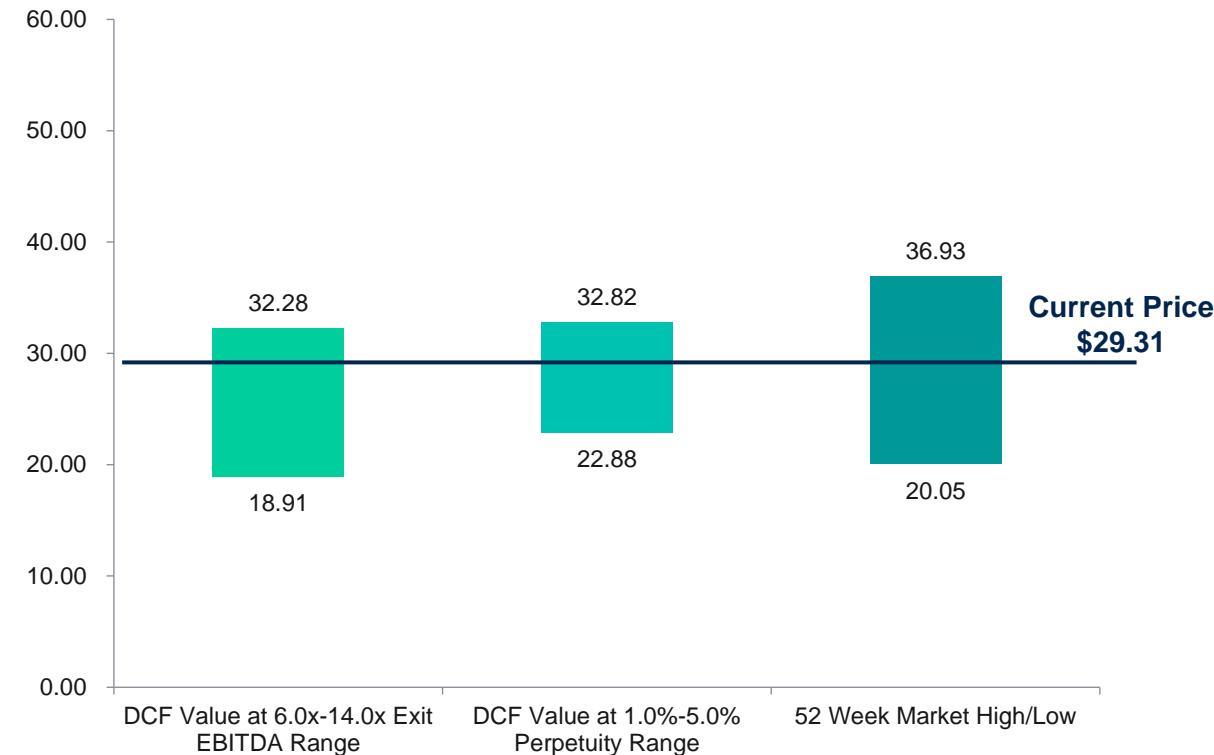
Current Enterprise Value: \$29.998 billion

+ Cash and Cash Equivalents: \$2.649 billion

- Total Debt: \$2.599 billion

Equity Value: \$30.027 Billion

Football Field



Enterprise Value via Perpetuity Approach: \$26.56 billion

Enterprise Value via Exit EBITDA Multiple Approach: \$25.54 billion

Vestas' DCF outputs indicate the company is **fairly valued** in relation to its current market valuation

Source: (Bloomberg, 2023)

Note: Expressed in USD with a conversion rate of 0.94 as of 2/20/23

Financial Overview | Synergies

SIEMENS



Potential Synergies Overview



Analysis of synergistic opportunities for Siemens and Vestas

	Siemens and Vestas possible synergies	Duration	Explanation
IRA Synergies	<ul style="list-style-type: none"> Tax credit of 10% of selling price for offshore wind manufacturers Additional credits available for projects that meet labor requirements Developers claim a 2.6 cent per kWh tax credit sold to unrelated parties The IRA introduces a 30% advanced manufacturing ITC providing \$10 billion in credits to projects that produce or recycle clean energy 	9-10 Years	<ul style="list-style-type: none"> Credits to Vestas' renewable manufacturing and development Vestas will see IRA benefits in the US offshore market
Cost Synergies	Manufacturing <ul style="list-style-type: none"> Streamlined manufacturing Siemens premier manufacturing asset base Project execution <ul style="list-style-type: none"> Siemens is experienced with execution Large-scale project management Corporate structure <ul style="list-style-type: none"> Experienced Team Political relations MSCI Rating 	3-10 Years	<ul style="list-style-type: none"> Siemens experience in manufacturing will streamline Vestas' efficiency Experienced project management team will optimize Vestas's projects
Revenue Synergies	Smart solutions <ul style="list-style-type: none"> Digital Industries Smart Infrastructure Efficiency Upgrades Customer base <ul style="list-style-type: none"> Siemens Large Customer Base Outstanding Industry Relations Financing capabilities <ul style="list-style-type: none"> Siemens Financial Services Siemens Balance Sheet Creditworthiness 	1-5 Years	<ul style="list-style-type: none"> Siemens smart solutions will increase operating efficiency of Vestas products Larger access to capital will lead to favorable financing Premier customer base
Post-Merger	<ul style="list-style-type: none"> Expanded renewable energy generation across geographical regions Larger market share in growing markets focused on renewable energy Product portfolio of Vestas integrated into Siemens smart infrastructure and digital industry driving seamless transition to clean energy Data and analytics provided by Siemens' technologies provides unique value proposition 	Lifelong	<ul style="list-style-type: none"> Production value increased due to GW capacity Enhanced negotiating leverage with foreign suppliers

Source (10-K (Vestas, 2022)), (Bloomberg, 2023)

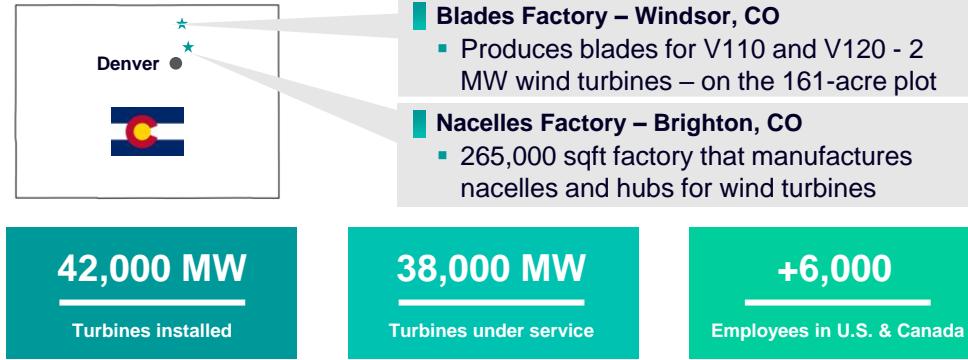
Inflation Reduction Act Driving Massive Value

SIEMENS

The IRA provides renewable energy companies with a unique opportunity to accelerate the adoption of clean energy through tax credits

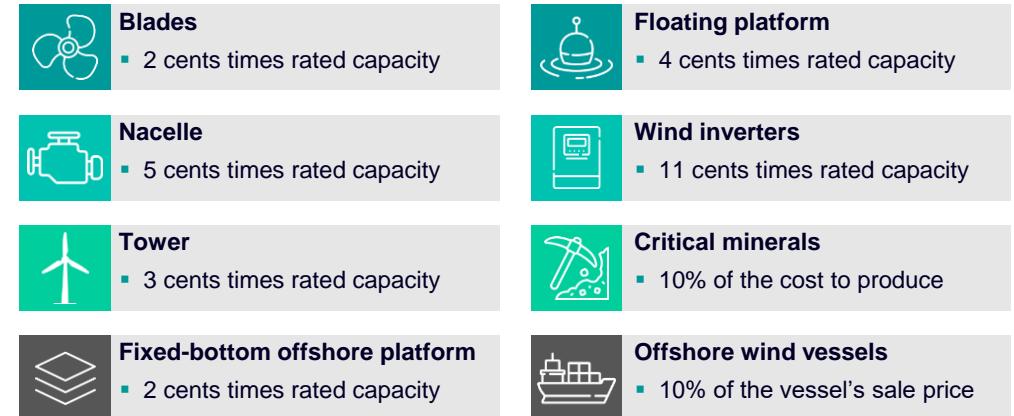
Vestas' North American footprint...

- In 2022, Vestas spent \$1.6 billion across the United States supply chain with 1,200+ suppliers and \$120 million across 200+ suppliers in Canada



...positions the company well to receive advanced manufacturing credits

- The IRA creates new tax credits for companies that domestically manufacture and sell clean energy in the United States between 12/31/2022 and 12/31/2032

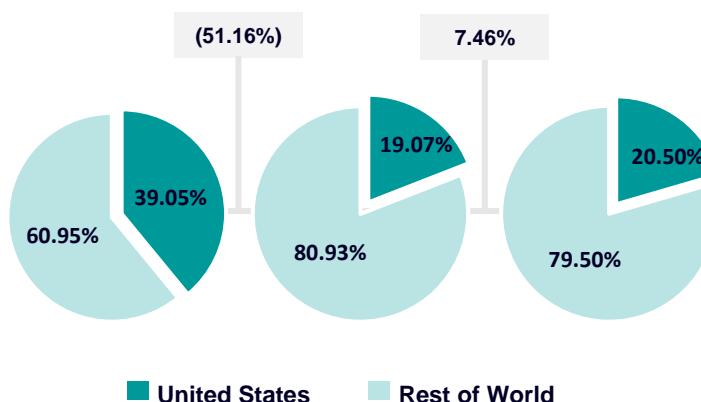


...has connections with major U.S. suppliers

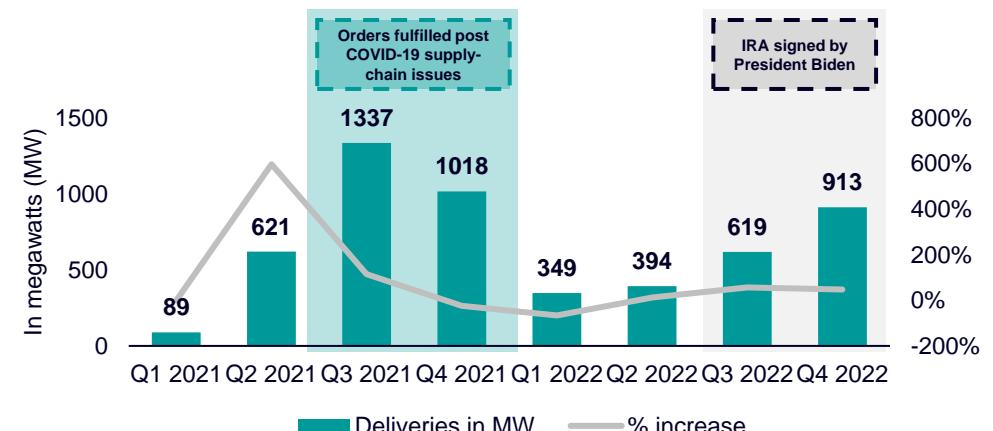


- An incentive bonus of **10 percentage points** for projects constructed with U.S. equipment and materials – critical relationships for the IRA

A large portion of Vestas' revenue comes from the United States



Vestas' U.S. wind turbine deliveries saw an increase after the IRA was signed



Source: (Annual Report (Vestas, 2022)), (WINDEXchange, 2022), (Bloomberg, 2023)

Attractive Cost Synergies

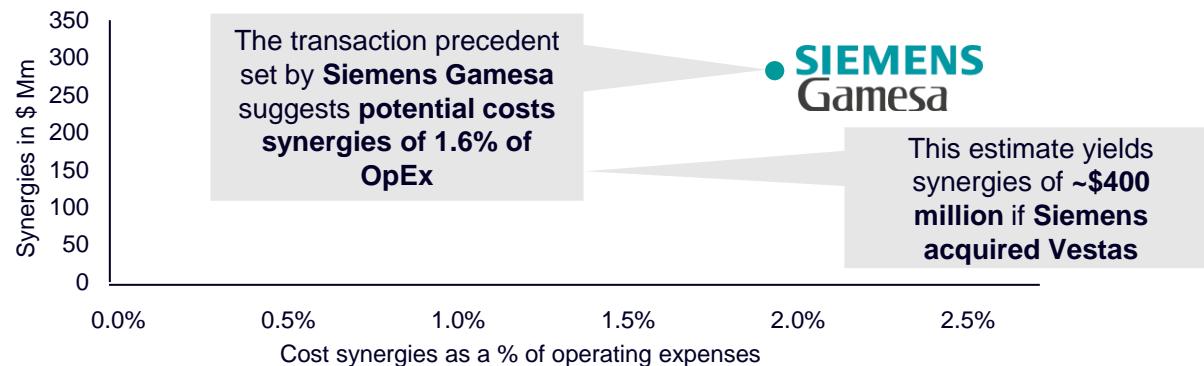
SIEMENS

Siemens and Vestas proposed merger would reap several cost synergies

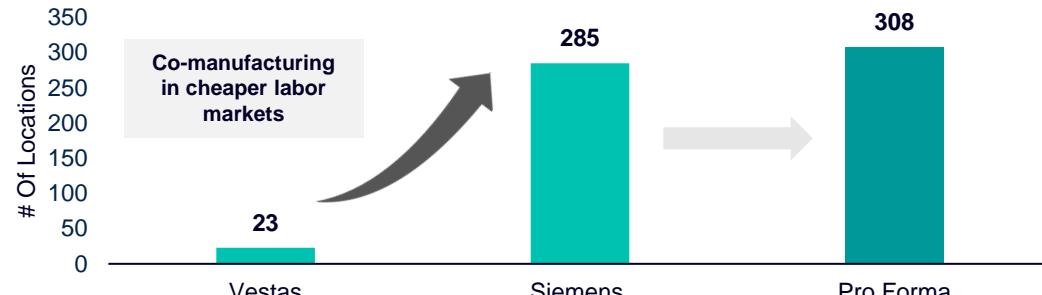
Operating efficiency

- By having access to Siemens premier global manufacturing asset base, Vestas would have the **capability to manufacture in markets with lower labor costs** and access to cheaper inputs
- Siemens efficient manufacturing capabilities will **cut down on lead times** improving supply chain snags
- These factors will all **improve the bottom line** of the pro-forma company

Siemens Gamesa spin-off suggests positive cost synergies



Manufacturing economies of scale higher on a pro-forma basis



Source: (Bloomberg, 2023)

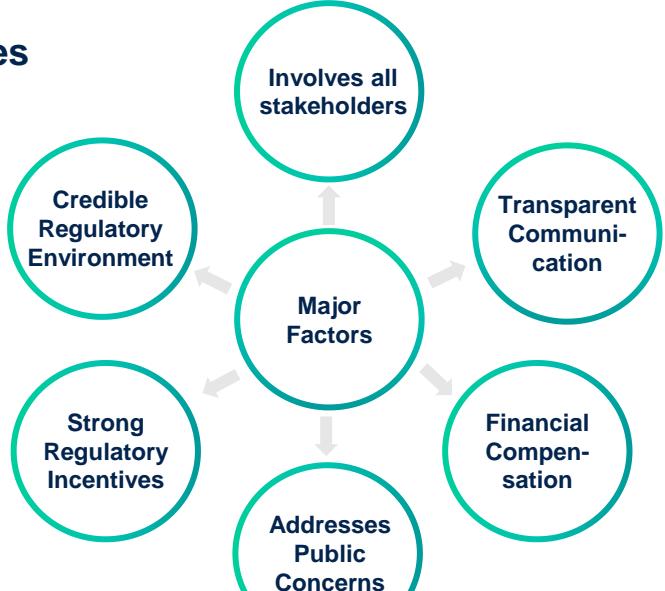
Efficient project execution aided by Siemens infrastructure expertise

- Consistent program planning and execution excellence are essential to the success of Energy & Utilities capital projects
- Siemens provides a systems approach to program planning and execution by integrating cost, schedule and technical requirements in a fully planned, resourced and budgeted program management solution
- By leveraging Siemens execution capabilities, Vestas will reap cost synergies



Achieving cost synergies

- The factors shown at right is what management must focus on in order to **unlock cost synergies** while also creating value for stakeholders
- By keeping these factors in mind while transacting with Vestas, **Siemens could realize cost synergies above our projected figure**
- Most important would be focusing on the **regulatory incentives with the GDIP program in Europe**



Revenue Synergies From Economies of Scale

By merging with Siemens, Vestas can offer smarter wind turbine solutions



Smart solutions

- By Leveraging Siemens Digital Industries and Smart Infrastructure offerings, Vestas will be able to provide a premier suite of Wind offerings
- Vestas would be able to increase their product offering beyond turbines and blades by offering smart solutions such as communication infrastructure, smart breakers, and wiring
- By offering more solutions for wind there is more opportunity for revenue growth



Outstanding customer base

- Siemens outstanding customer base presents a great opportunity for cross selling with Vestas
- Many of Siemens customers are focused on decarbonization initiatives, by having access to the Vestas platform they can further these initiatives
- Furthermore, Siemens customers can cross sell to Vestas



Emphasis on reducing emissions

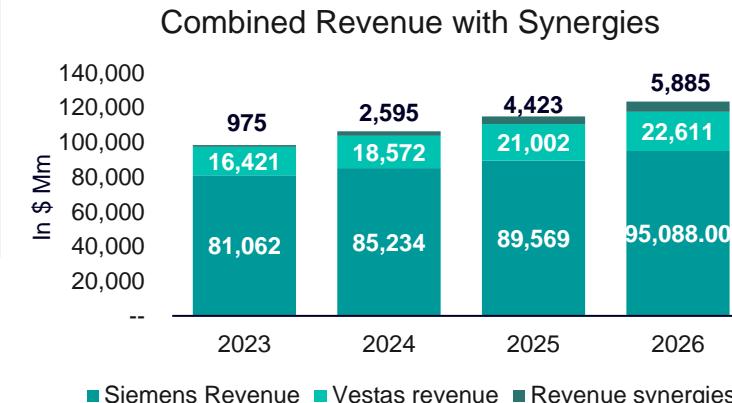
- Being able to efficiently cross sell Vestas smart wind turbines to these companies could greatly grow revenues
- These heavily industrial capital goods manufacturers would greatly benefit by having the capability to efficiently power their powerplants using Siemens and Vestas wind turbines
- All of the select customer additions highlighted to the right have outlined net zero emissions plans



Advancing IOT wind solutions with product synergies

- Siemens product offering in the smart infrastructure segment enables interconnectivity and efficiency to wind developers
- Benefits include turbine-to-turbine communication, predictive maintenance, and instant data analysis
- By streamlining their offerings, the combined company could be the preeminent smart turbine manufacturer

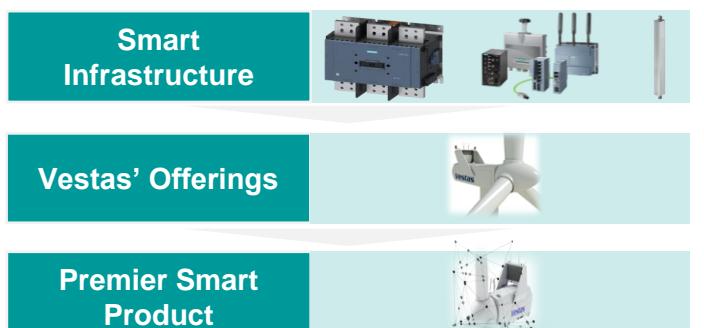
Source: (Bloomberg, 2023), (FactSet, 2023)



Select Customer Additions



Interconnectivity



Acquisition Feasibility Analysis



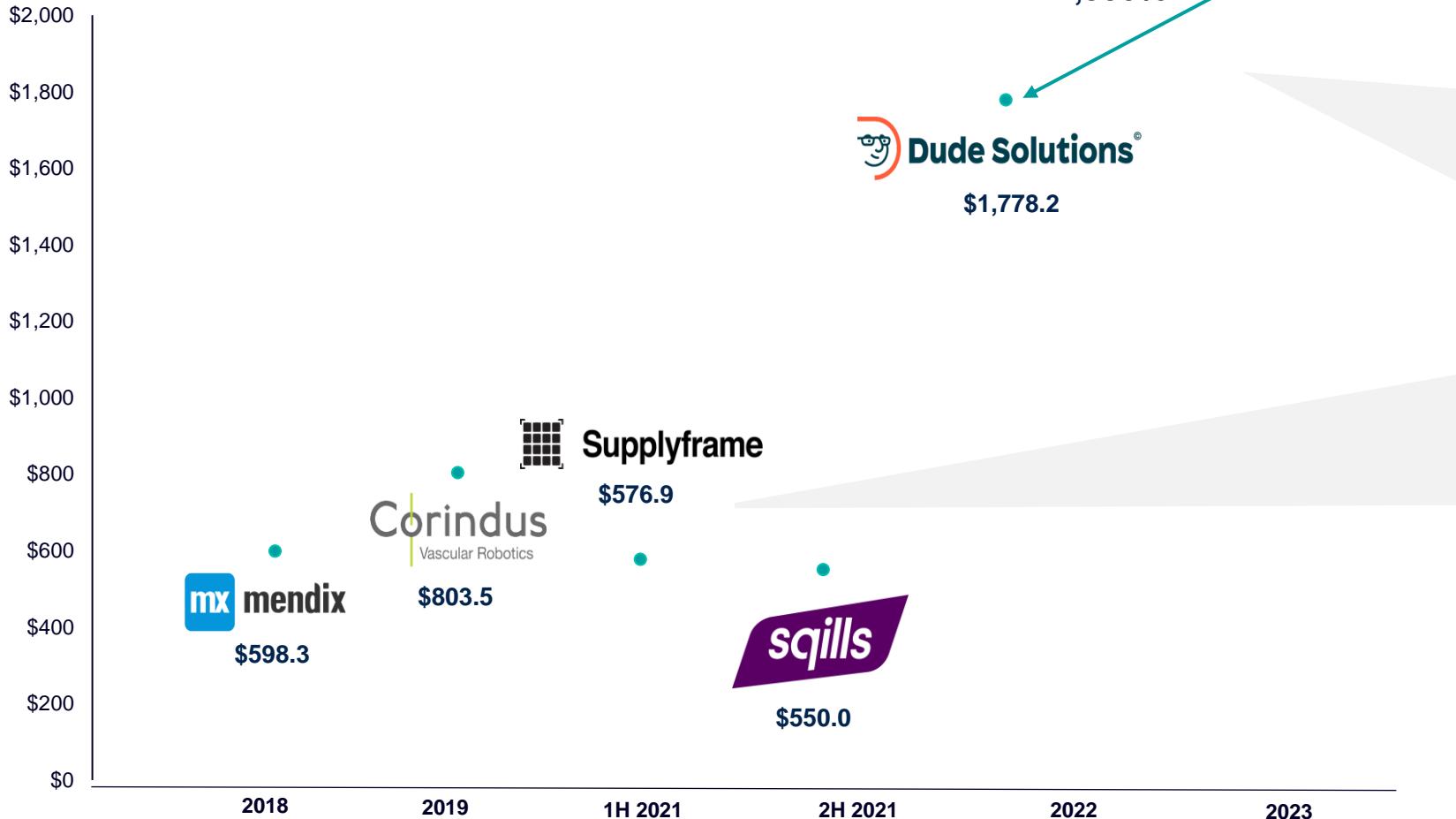
Siemens Past Acquisitions Favor Smaller, Tech Focused Companies

SIEMENS

An acquisition of Vestas would be an outlier in both deal size and industry focus for Siemens

Siemens major acquisitions 2018-present in millions of dollars

Siemens has made smaller, targeted acquisitions related to enterprise technology



Source: (Annual Report, (Siemens, 2022), (Bloomberg, 2023))

Inordinate deal size

- Siemens has not completed an acquisition with total consideration over ~\$2bn for the past five years
- Siemens boasts a dividend yield of 3.03% as returning capital to their shareholders is a key strategy of theirs
- With that in mind, acquiring vestas at a \$30bn valuation, roughly 20% of Siemens total market cap, would not be prudent of management

Wrong industry focus

- Siemens past acquisitions were focused on tech-enabled solutions for industry
 - **Mendix:** Enterprise app development
 - **Corindus:** Vascular robotics
 - **Supplyframe:** Design-to-source intelligence solution
 - **Sqills:** Public transportation optimization
 - **Dude Solutions:** Asset management software
- Vestas is a large capital goods manufacturer; this is in stark contrast to siemens acquisition strategy

Note: Expressed in USD with a conversion rate of 0.94 as of 2/20/23

Vestas and Siemens Strategies Don't Align

SIEMENS

Siemens already divested from the wind space, recognizing more growth in other areas

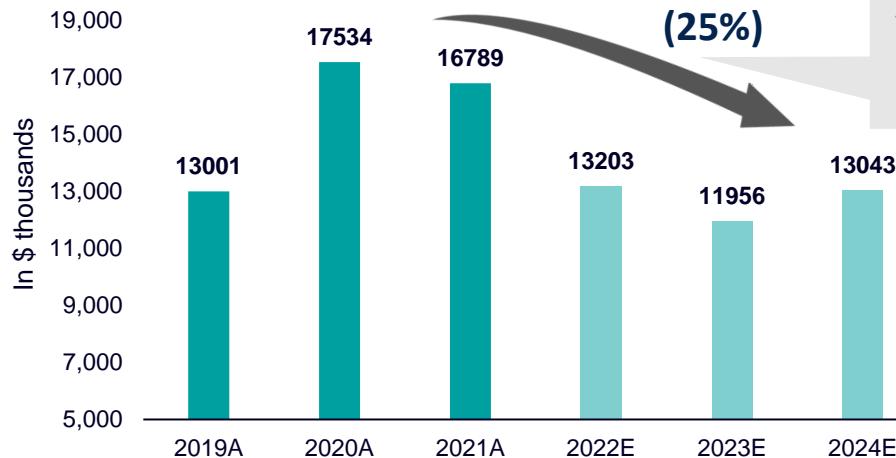
The gusts of wind were too strong for Siemens' business model

- In 2020, Siemens spun off their energy business which resulted in **Siemens Gamesa**, a manufacturer of wind turbines
- On January 25th of this year, Siemens Gamesa was delisted from the CNMV due to **serious financial challenges** facing the wind industry
- These challenges include but are not limited to higher input prices, supply chain constraints, and lower order volumes



Turbine orders across the sector slowing down

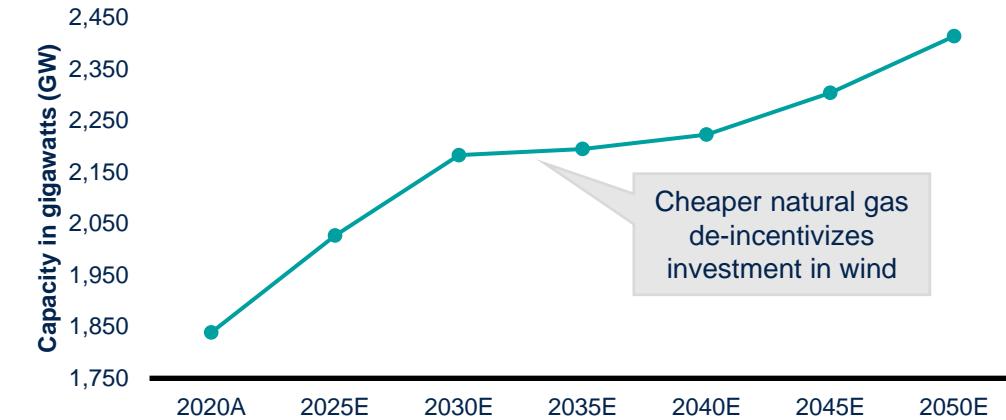
Vestas' projected orders



- Slowing turbine orders reflecting **lower demand globally** for wind power, showing a **shift back to traditional fossil fuels or favoring other sources of alternative energy**
- Turbine orders may be buoyed by the **IRA in the United States**, however, the near zero interest rate environment of late 2020 to early 2021 may have boosted turbine sales, indicating a slight bubble

Source: (Annual Report (Siemens, 2022)), (Annual Report (Vestas, 2022)), (Bloomberg, 2023)

Global installed natural gas generation capacity outlook 2020-2050



- Greater natural gas supply will result in lower prices, making investments into wind power less attractive, especially in a high interest rate environment

Siemens divesting from other capital goods manufacturers, re-evaluating strategy

- Siemens strategy has changed in the past 3 years as they have let divisions have more freedom while still realizing accretive synergies
- This means building more exposure to automation, software building technologies, and public transport/mobility
- Siemens has shown this change of strategy by divesting their exposure to capital intensive heavy industries as shown in the timeline below
- Viewing Siemens through this framework makes Vestas seem like an unusual target given their current strategy



Siemens Downgrade Risk Post-Vestas Acquisition

SIEMENS

Siemens faces massive downgrade risk in almost every acquisition debt financing scenario

Moody's

A1

S&P Global

A+

100% Debt

Pro Forma Moody's-adjusted EBITDA Breakdown

FY	2022
Reported pro forma pre-tax income	5,502
Add back Interest expense	689
Add back D&A	3,609
Reported pro forma EBITDA	9,800
Equity income adjustment	2,085
SFS adjustment	-1,135
Pension adjustment	-17
Unusual items	-1,014
Adjusted pro forma EBITDA	9,719

Moody's-adjusted Debt Breakdown

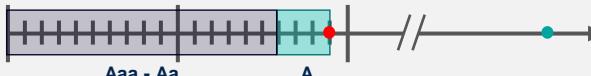
FY	2022
Total unadjusted debt	50,636
100% Debt financing of Vestas	30,000
Pension adjustment	1,979
Other standard adjustments	-30,827
Total adjusted pro forma debt	51,788
Moody's adjusted pro forma debt to EBITDA	5.3x

- Moody's range for global industrials scorecard range for Debt/EBITDA is 1.6x - 1.9x for an A rating

DOWNGRADE to Baa3

Current: 1.9x

Proposed: 5.3x



Source: (Moody's, 2022), (S&P Global, 2022)

Siemens' Credit Rating

- If Siemens were to acquire Vestas at the below levels of debt, the company would be at risk of being downgraded by Moody's and S&P Global

50% Debt

Pro-Forma Moody's-adjusted EBITDA Breakdown

FY	2022
Reported pro forma pre-tax income	5,502
Add back Interest expense	689
Add back D&A	3,609
Reported pro forma EBITDA	9,800
Equity income adjustment	2,085
SFS adjustment	-1,135
Pension adjustment	-17
Unusual items	-1,014
Adjusted pro forma EBITDA	9,719

Moody's-adjusted Debt Breakdown

FY	2022
Total unadjusted debt	50,636
50% Debt financing of Vestas	15,000
Pension adjustment	1,979
Other standard adjustments	-30,827
Total adjusted pro forma debt	36,788
Moody's adjusted pro forma debt to EBITDA	3.8x

Moody's

1.9x

S&P Global

1.6x

25% Debt

Pro-Forma Moody's-adjusted EBITDA Breakdown

FY	2022
Reported pro forma pre-tax income	5,502
Add back Interest expense	689
Add back D&A	3,609
Reported pro forma EBITDA	9,800
Equity income adjustment	2,085
SFS adjustment	-1,135
Pension adjustment	-17
Unusual items	-1,014
Adjusted pro forma EBITDA	9,719

Moody's-adjusted Debt Breakdown

FY	2022
Total unadjusted debt	50,636
25% Debt financing of Vestas	7,500
Pension adjustment	1,979
Other standard adjustments	-30,827
Total adjusted pro forma debt	29,288
Moody's Adjusted pro forma Debt to EBITDA	3.0x

Foreign Exchange Risk

By acquiring Vestas, Siemens faces potential currency risk that is typically present in cross-border transactions



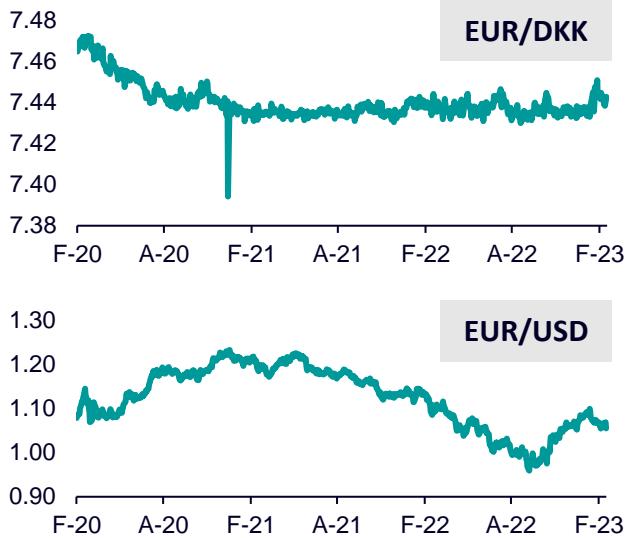
Siemens FX risk

- Siemens' principal currency is the **Euro**, but the company transacts in **U.S. Dollar**, the **British pound**, and emerging market currencies such as the **Chinese yuan**, exposing the company to currency risk
- The company consolidated statements are expressed in Euro, but for the beginning of March 2023 the statements were converted in US Dollar applying an exchange rate of **€0.94 = \$1.00**
- This can cause unalignment in financial statements due to fluctuating exchange rates
- Fluctuating rates can also affect interest rates in the deal, which can make debt financing more costly and increase the difficulty of generating returns

Vestas FX risk

- Vestas' principal currency is the **Danish Krone**, but most of its sales are done in **USD** and **EUR**
- Vestas' currency exposure in USD has decreased as a result of increased sourcing of materials and components in USD
- Because Vestas is a project-based business, risk exposures to specific foreign currencies change each year based on which geographical areas in which Vestas has activities
- Vestas' Euro exchange rate risk is low due to Denmark's fixed exchanged rate policy towards the Euro, but transactional risk remains due to potential exchange rate fluctuations

Most prevalent FX exchange rates



Managing FX Risk

- Siemens uses the following **hedge accounting method** to prevent FX risk:

Siemens Hedge Accounting Method	Millions of euros		Millions of U.S. dollars
	2021	2022	2022
Effects of changes in exchange rates on cash and cash equivalents			
Change in cash and cash equivalents	204	679	714
Cash and cash equivalents at beginning of period	(4,509)	927	975
Less: Cash and cash equivalents of assets classified as held for disposal and discontinued operations at end of period	14,054	9,545	10,035
Cash and cash equivalents at end of period	0	(7)	(7)
	9,545	10,465	11,002

- To hedge FX risk, Siemens has employed forward currency contracts, but Siemens should use a **deal-contingent FX hedge** to mitigate exposure to variability
- A **deal-contingent FX hedge** combines the standard forward currency forward contract with an FX option to lock in a forward rate and mitigate price volatility risk
- Vestas employs a **hedge accounting model** and applies the following sensitivity assumption to foreign exchange rates movements on USD and EUR to reduce risk:

Vestas FX Risk Sensitivity Analysis (mEUR)	Change	2021		2022	
		Effect on profit/(loss) before tax	Effect on equity before tax	Effect on profit/(loss) before tax	Effect on equity before tax
Foreign Currency Risk					
USD	10%	(20)	146	(49)	159

Source: (Annual Report (Siemens, 2022)), (Annual Report (Vestas, 2022)), (Danmarks National Bank, 2023), (European Central Bank, 2023), (Statistics Denmark, 2023)

Acquisition cost scenario analysis at \$35.81 per share

Bear case



\$36.28B

EUR/DKK = 7.48

Base case



\$36.09B

EUR/DKK = 7.44

Bull case



\$35.99B

EUR/DKK = 7.42

- Because the principal currencies of Siemens and Vestas differ, foreign exchange risk can potentially affect valuations of the deal
- It is assumed that Vestas' equity holders would like to be paid in Danish kroner. To mitigate any currency fluctuation, Siemens would issue **notes** in the **Nasdaq Copenhagen** to raise the funds necessary to finance the transaction
- Interest and amortization expenses would be covered with the cash flows generated by the integration of Siemens' and Vestas' wind power infrastructure

Note: Expressed in USD with a conversion rate of 0.94 as of 2/20/23

ESG Implications

SIEMENS

ESG standards have the potential to impact Siemens' acquisition of Vestas

Siemens has strong ESG goals...

- Siemens **DEGREE** framework sets clear measurable ambitions
- **Net Zero** operations by **2030**, with 55% emissions reduction by 2025 and 90% by 2030
- Striving to train **100%** of employees people on **Siemens' Business Conduct Guidelines** every three years
- **ESG-secured supply chain** based on supplier commitment to the Supplier Code of Conduct
- Next-level robust **eco-design** for 100% of relevant Siemens product families by 2030
- **30% female** share in top management by 2025
- Access to **employee assistance program**: maintain high level and expand globally to 100% by 2025

... and it shows through their achievements



Constant leader for six years

80 Points

Member of
Dow Jones
Sustainability Indices

2nd in Industrials industry
for 20 years



Constituent for
EUROZONE since 2020

PREMIUM
ISS ESG

No. 1 in Siemens industry group



Part of the FTSE4Good index family



Over 10 years at
leadership level

Vestas' ESG initiatives



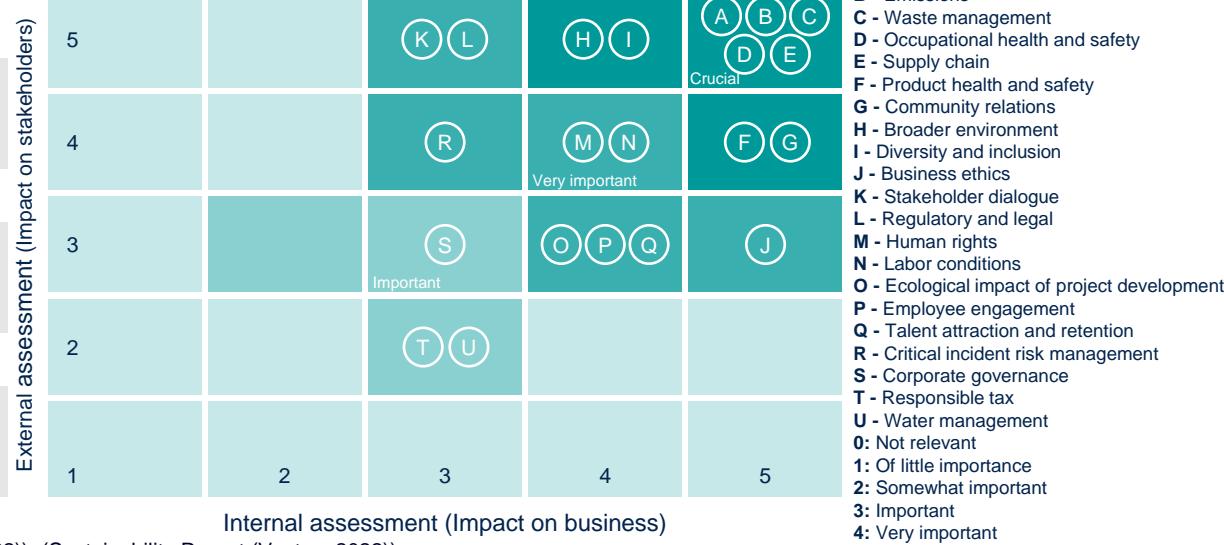
Environmental
▪ Using nature-based solutions so wind farms can have a net-positive biodiversity impact



Social
▪ Become the safest, most inclusive, and most socially responsible company



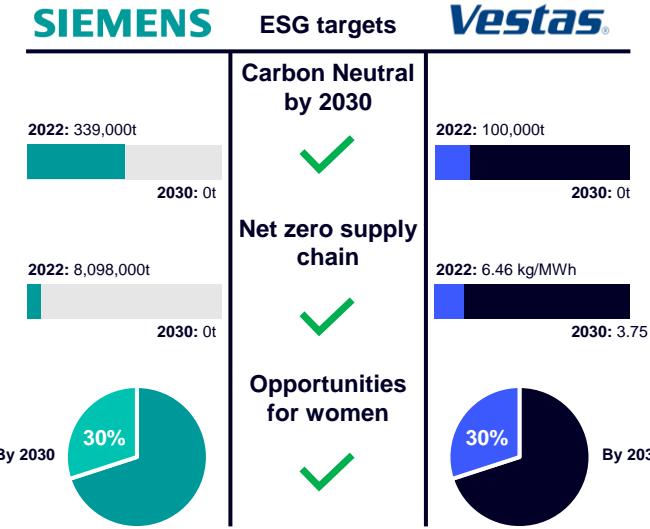
Governance
▪ Strengthening policies, processes, training, and communication around business to foster integrity



Source: (Sustainability Report (Siemens, 2022)), (Sustainability Report (Vestas, 2022))

Post merger ESG implications

- The proposed acquisition would be massively **ESG accretive** as both companies ESG goals align almost perfectly. It is possible that the merger could **boost Siemens ESG score** considering the amount of ESG synergies



Acquisition gives Siemens access to Vestas' quality memberships



Member of
Dow Jones
Sustainability Indices
Powered by the S&P Global CSA



AMERICAN
CLEAN
POWER



Financing Scenario Analysis

SIEMENS

After analyzing three different structures for this acquisition, none are feasible or logical

Debt financing	
<ul style="list-style-type: none">By financing this acquisition with 100% debt using 20-year notes marked at SOFR plus 1.00 (6.60%) would have massive implications that would negatively impact Siemens' leverage ratiosReferring to the slide 52, we can see that Siemens Adjusted Debt/EBITDA ratio would increase by 4.1x resulting in their credit worthiness being downgraded to Baa3Due to these reasons, debt financing is infeasible	

Benefits
<ul style="list-style-type: none">Shareholder dilution not affectedTax deductibility of interest expense poses a major benefit to book taxes after D&A write-upsThe resulting debt would be cheaper than equitySiemens is a leader in the market, leading them to holding negotiating power with lenders

Risks
<ul style="list-style-type: none">Credit rating downgrade is almost certainSignificant leverage to acquire a business whose projects yield minimal returnsDefault risk is significantly raised – could ruffle the feathers of investors on both sides of the debt and equity aisles

Equity financing	
<ul style="list-style-type: none">By financing this acquisition with 100% equity, Siemens would have to issue 211 million shares resulting in a 1.2% dilutive effect to pro forma EPSEquity financing in the green energy sector is exceptionally expensive. Green & renewable energy companies have an average cost of equity of 13.39% vs the total market average of 10.75%Current market conditions have made equity less attractive to individual investors, favoring bondsDue to these reasons equity financing is not ideal	

Benefits
<ul style="list-style-type: none">Credit rating is not affected by changes to Debt/EBITDA ratioNo institution holds >3.5% of shares, meaning dilutive effect is not massive for a single institutionSizeable interest payments avoidedVestas' shareholders avoid double taxation

Risks
<ul style="list-style-type: none">~21% of shares are held by institutions leaving many parties to be negotiated with100% equity would require issuing 211 Mm shares to be issued – roughly 26% of current shares outstandingIn a 60/40 consideration, Siemens would need to issues 84 MM shares to acquire Vestas

Equity/cash hybrid	
<ul style="list-style-type: none">By financing this acquisition with 40% debt and 60% equity, there would be dilutive to EPS by 1.2%By using a combination of debt and equity you reap the benefits of both. Retaining ownership in the company through issuing equity but also keeping your cost of capital with debt financingWhile this structure is the most favorable to the other proposed structures, the deal size is still too large to mitigate the negatives with any structure	

Benefits
<ul style="list-style-type: none">Reduced default risk on massive debt loadControlling stake is maintained as no new shares are issuedWACC is not significantly affected as debt and equity considerations are not stretched to their limits

Risks
<ul style="list-style-type: none">In the scenario with the lowest cash consideration of 1%, this requires Siemens to hand over \$304 MMDebt is necessary for this deal as Siemens does not have enough cash on hand to purchase Vestas with cash aloneIf Siemens used all their cash (~\$10 Bn), they would still need to raise almost ~\$20Bn to complete the deal

Source: (Damodaran, 2022)

Company profile

Siemens Financial Profile

Fully Diluted Shares Outstanding	800
Current Share Price	\$153.94
Equity Value	\$123,149
Forecasted Earnings Per Share (EPS) _{t+1}	\$8.67
P/E Multiple	17.8x

Vestas Financial Profile

Fully Diluted Shares Outstanding	1,006
Current Share Price	\$29.31
Equity Value	\$29,486
Forecasted Earnings Per Share (EPS) _{t+1}	\$1.99
P/E Multiple	14.7x

Transaction and financing assumptions

Transaction Assumptions

Offer Price Per Share	\$38.10
% Offer Premium	30.0%
Offer Value	\$38,332

Cash Consideration (All-Debt Funded)

Offer Value	\$38,332
% Cash	40.0%

Total Debt Financing

Financing Fee	\$1,024
Financing Fee % Total Debt	6.7%

Borrowing Term	20 Years
----------------	----------

Financing Fee Amortization

% Interest Rate	5.1%
Annual Interest Expense	\$777

Source: (Bloomberg, 2023)

Accretion/dilution analysis

Accretion/Dilution Analysis

Acquirer Standalone Net Income	\$6,936
% Tax Rate	22.0%
Earnings Before Taxes (EBT)	\$8,893

Pro Forma Financials

Consolidated EBT	\$11,459
Less: Interest Expense and Financing Fees	(829)
Plus: Synergies, net	400
Less: Incremental Depreciation	(636)
Pro Forma Adjusted EBT	\$10,394
Less: Taxes	(2,287)
Pro Forma Net Income	\$8,108

Target Standalone Net Income	\$2,002
% Tax Rate	22.0%
Earnings Before Taxes (EBT)	\$2,566

Pro Forma EPS

Pro Forma Net Income	\$8,108
Pre-Deal Acquirer Shares Outstanding	800
Plus: New Shares Issuances	149
Pro Forma Diluted Shares	949
Pro Forma EPS	\$8.54
% Accretion / (Dilution)	(1.5%)

Dilutive to pro-forma
EPS by (1.5%)

Form of Consideration

% Stock	60.0%
% Cash	40.0%

Stock Consideration

Offer Value	\$38,332
% Stock	60.0%

Stock Consideration

Number of Acquirer Shares Issued	149
----------------------------------	-----

Deal Assumptions

Synergies, net	\$400
Transaction Fees	\$958
Transaction Fees % Offer Value	2.5%

Purchase Price Accounting

Offer Value	\$38,332
Less: Net Tangible Book Value	(2,000)

Purchase Premium

Less: PP&E Write-Up	(9,083)
Less: Intangibles Write-Up	(3,633)

Plus: Deferred Tax Liability (DTL)

2,798

Goodwill Created

\$26,414

Asset Write-Ups

% Allocation to PP&E	25.0%
Useful Life Assumption	20 Years

Incremental Depreciation

\$454	
% Allocation to Intangibles	10.0%

Useful Life Assumption

20 Years

Incremental Amortization

\$182

Note: Expressed in USD with a conversion rate of 0.94 as of 2/20/23

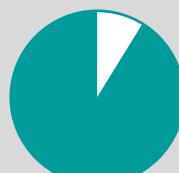
A photograph of a group of professionals in an office environment, focused on reviewing large-scale architectural blueprints spread out on a table. One person stands leaning over the table, while others sit around it, examining the plans. A computer monitor is visible in the background, suggesting a modern workspace.

Alternative Solution

Vestas and Siemens Strategies Don't Align

Siemens already divested from the wind space, recognizing more growth in other areas

SIEMENS

	Relevance & rationale	Product alignment	Strategic feasibility	Financial feasibility	Decision
GENERAC	<ul style="list-style-type: none"> Premier brand with large customer base already in place Generac is currently expanding their smart grid solutions moving away from C&I products 				<ul style="list-style-type: none"> ~\$10Bn valuation: too large Too much fossil fuel exposure in large generator segment
ENPHASE	<ul style="list-style-type: none"> Manufacturing of solar panels could be optimized with Siemens System Solar power is growing to be a more attractive vertical 				<ul style="list-style-type: none"> ~\$28 Bn valuation: too large Capitally intensive business much like Vestas
SUNRUN	<ul style="list-style-type: none"> Large exposure in residential solar installation and maintenance Siemens metering technology would be a great synergy 				<ul style="list-style-type: none"> ~\$5 Bn valuation attractive, but not best strategic fit Siemens focuses on industry over residential
stem	<ul style="list-style-type: none"> Direct competitor with Fluence – a Siemens investment Combining the two would make them the market leader in energy storage 				<ul style="list-style-type: none"> ~\$1Bn valuation in line with precedents Complimentary to Siemens strategy

Source: (Bloomberg, 2023)

Stem, Inc. Overview

SIEMENS

A world leader in energy solutions with successful technology platform and proven management

Overview of Stem, Inc.

- Stem, Inc. is a leader in AI-driven clean energy solutions
- The company provides customers with digitally integrated energy storage systems that include hardware that aid with data collection and real-time operation
- **Athena** is an AI platform that helps to reduce customer energy costs through time-of-use and demand change management innovations and a network of VPP's



John Carrington
CEO



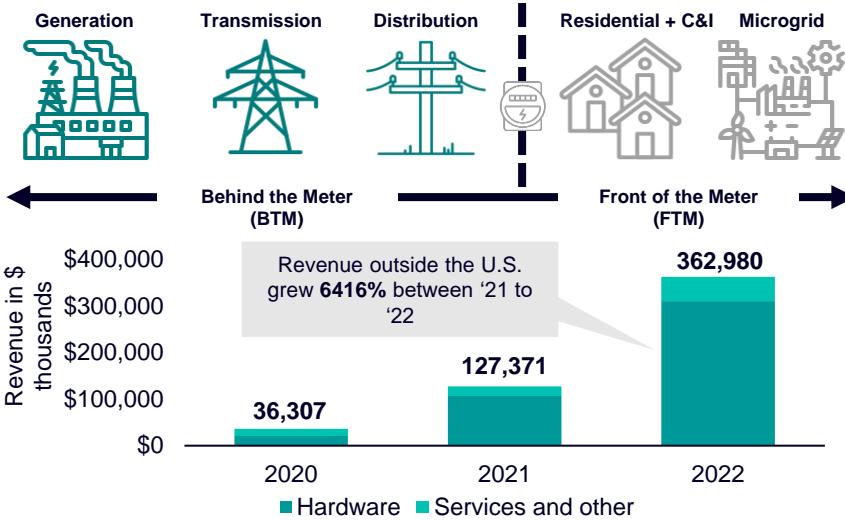
Michael Carlson
COO



Bill Bush
CFO



Front of the Meter vs. Behind the Meter



Athena - a leading energy performance AI platform...

- Uses advanced AI to optimize customer operations by automatically controlling system batteries

Will automatically switch to...



Battery Storage



Onsite Generation



Grid Power

Athena statistics

- 30 of the Fortune 500 use Athena
- 40+ Utilities
- 31+ MM runtime hours
- >200,000 sites in 50+ countries

Front of the Meter Customers



Alphabet



IHG®



Cargill®



amazon



Meta

Behind the Meter Customers



CYPRESS CREEK RENEWABLES



DSD



Greenskies



..that includes time-of-use arbitrage



- Identifies and predicts the **best times to store** energy and **release** it back into the grid
- Maximize savings by lowering demand and energy charges

Source: (10-K (Stem, Inc. 2022)), (Climate Tech VC, 2022), (Investor Day (Stem, Inc. 2022)), (Bloomberg, 2023) (Stem, Inc. 2023)

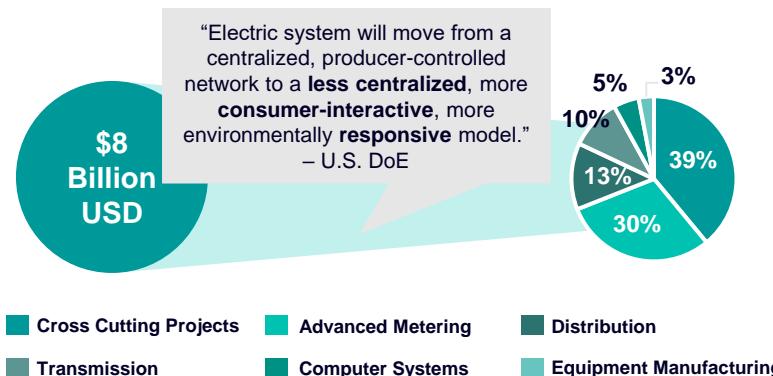
Powering Up: Decentralized Grids

SIEMENS

The vision for decentralized grids has evolved over recent decades, but now the grid is taking the main stage

Even in 2009, a shift to decarbonized grid was a focus for the future...

- The Smart Grid Investment Grant aimed to accelerate the modernization of the nation's electrical grid with an \$8 Bn investment



...that focus opened doors for today...

- US microgrid market reached 10 GW in Q3 '22
- For comparison, 1H '20 had only **60 MW** connected



New microgrid installations in the US...



...and keeps them open for tomorrow.

Industries leading in project development

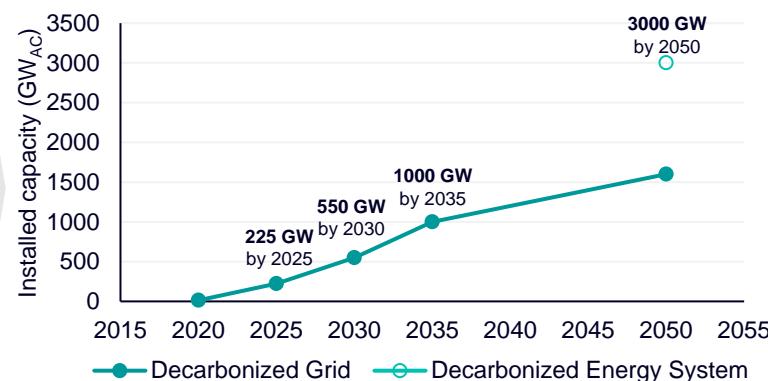
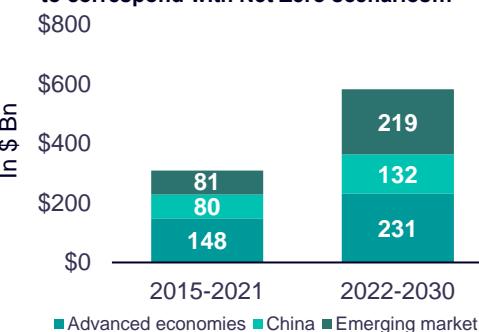


Projected global microgrid market size...

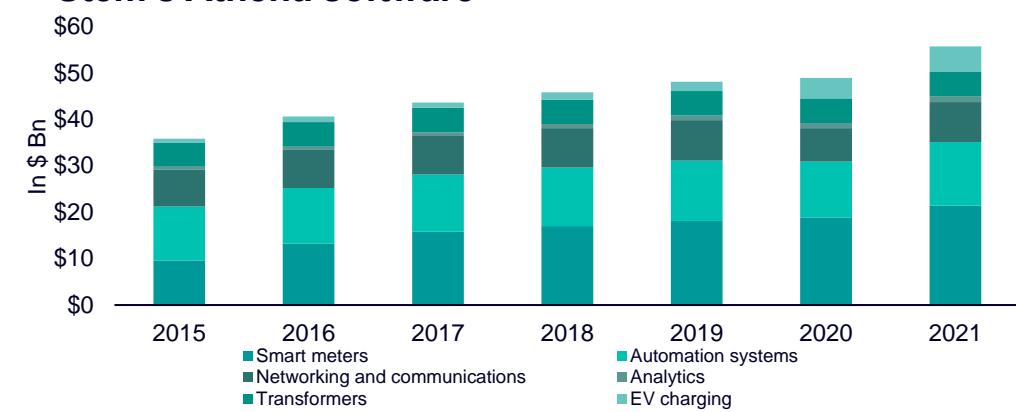


Decarbonizing the grid could result in significant solar output...

Grid investment needs to double by 2030 to correspond with Net Zero scenarios...



Investment in digital infrastructure bodes well for Stem's Athena software



Source: (IEA (2), 2022), (Precision Business Insights, 2022), (SmartGrid.gov, 2022), (Wood Mackenzie (3), 2022), (Solar Energy Technologies Office, 2023), (Statista, 2023)

Siemens' Fluence and Stem | A Perfect Fit

SIEMENS

By acquiring Stem, Siemens' Fluence would become the biggest player in North American battery storage

Siemens' exposure to U.S. battery storage



Siemens Acquired Fluence through a JV in June of 2017

- Fluence is a global provider of energy storage products, services, and artificial intelligence
- Fluence Cube technology combined with their **Gridstack AI** helps energy providers and producers in flexing peak capacity, allowing producers to arbitrage prices



Fluence Systems are completely modular



Which makes them extremely scalable

Fluence business segments



Energy Storage Products

- Components (including batteries), professional services, and labor required to manufacture, assemble, and install products



Services

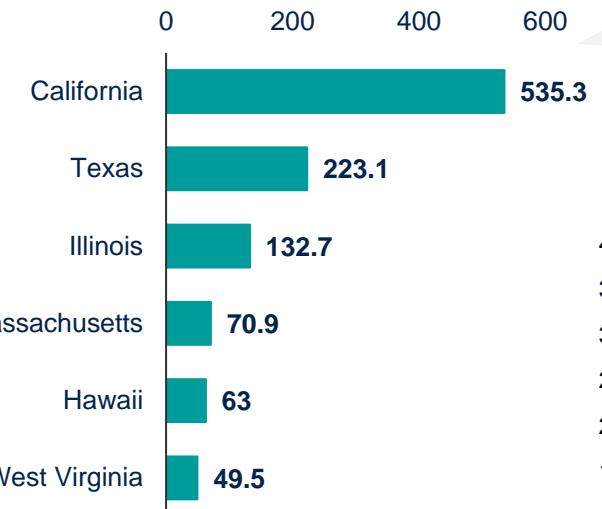
- Recurring operational and maintenance services that energy storage products require, management services that are provided by third parties when asset owners outsource the operations of their systems, and the provision of ESaaS



Digital Apps & Solutions

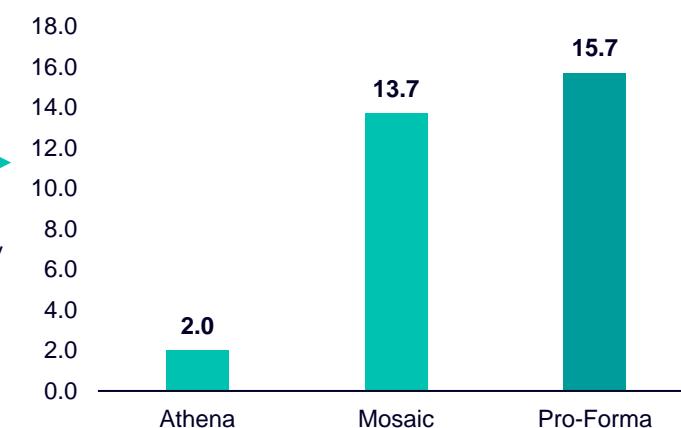
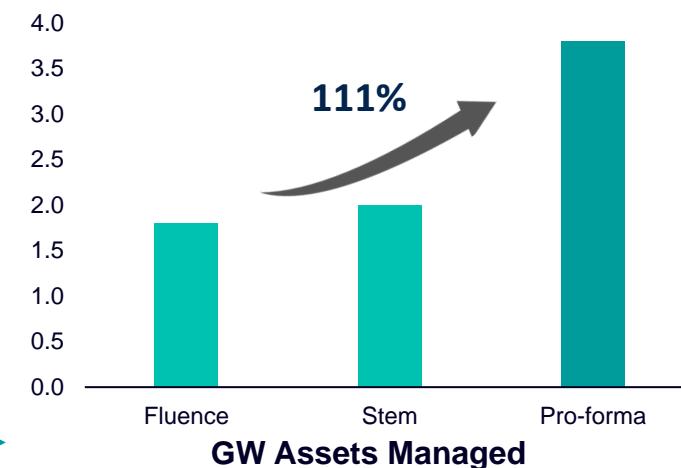
- Operating systems, applications, such as trading platforms that allow system owners to manage their grid participation. These trading platforms can be deployed on both energy storage assets and renewable and conventional generation assets

Installed U.S. Capacity (in MW)



Both Fluence and Stem have a large exposure to CA and TX, which represent some of the largest end markets in the U.S.

Post merger synergies GW Deployed



By Acquiring Stem, Siemens Fluence would grow their total North American Gigawatts Deployed by 111%, making it the largest pure play energy storage company in North America

By Acquiring Stem, Siemens Fluence will integrate their already prolific Mosaic software, connecting both customer bases and integrating them onto the same system

Source: (EIA.gov, 2021), (Bloomberg, 2023)

Stem Positioned Excellent to Reap IRA Benefits

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IRA incentives outweigh those of the Green Deal

EU commission Green Deal Industrial Plan

Predictable and simplified regulatory environment



- The net zero industrial act will provide a supportive framework for industrial capacity goals by 2030 by reducing length of permitting process, reinforcing administrative capacity, and providing specific time limits
- Complemented by the Critical Raw Materials Act which ensures sufficient access to key resources



Speeding access to financing

- Allow ease of access for member states to support the deployment of all renewable energy sources by granting aid for less mature technologies and incentivize investment with higher aid ceilings to fast-track the green transition using national funding
- EU budget will contribute through REPower (20 billion in grants, 225 billion in loans), InvestEU (372 billion) and EU Innovation Fund (40 billion)



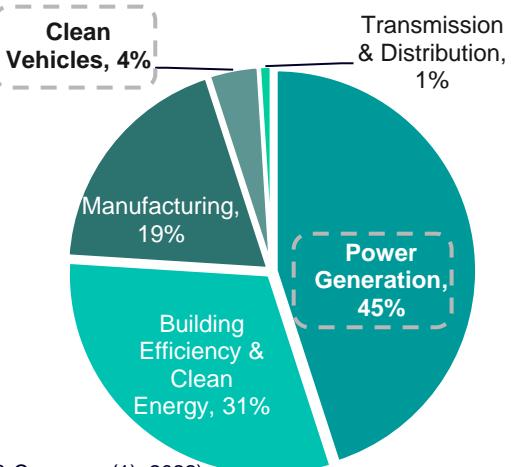
Enhancing skills and open trade for resilient supply chains

- European Pact for Skills now counts for 1,000 partners targeting to up/reskill 6m people
- EU will continue to support relationships with trade partners, foster international trade, increase free trade agreements, and establish a critical raw materials club

Distribution of IRA incentives



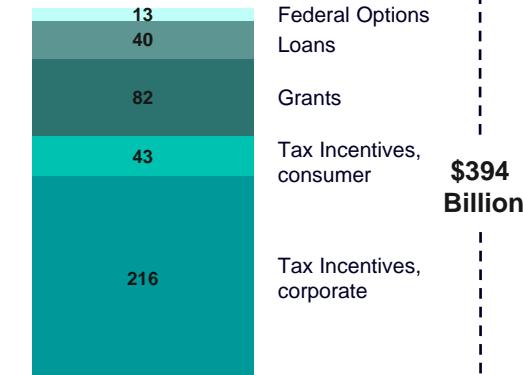
Stem will see a significant benefit from the IRA...



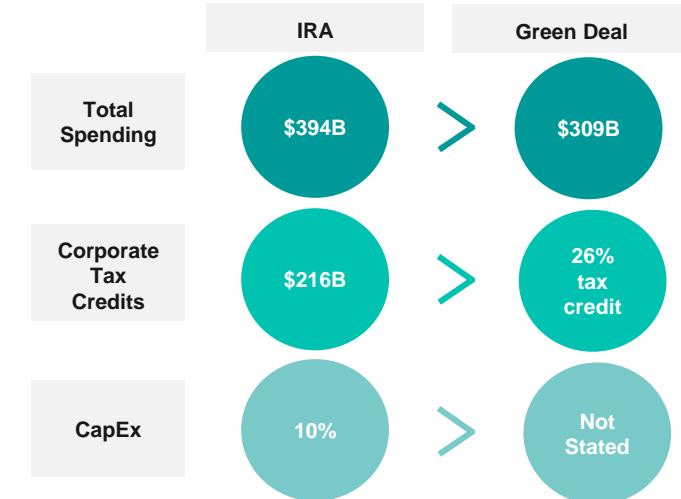
U.S. Inflation Reduction Act

- The IRA is expected to catalyze investments in domestic manufacturing capacity and innovation with the highest beneficiaries being

Energy and climate change funding in IRA



The IRA poses a competitive threat to the EU's Green Deal Industrial Plan



...in multiple areas of their business

Standalone storage ITC - greenfield

- Improves customer economics with 30 – 60% reduction in project costs
- This results in massive demand for clean energy solutions from consumers

Standalone storage ITC - retrofit

- \$6B potential AlsoEnergy storage retrofit opportunity in core markets
- \$20B for entire AlsoEnergy Portfolio

Solar production tax credit

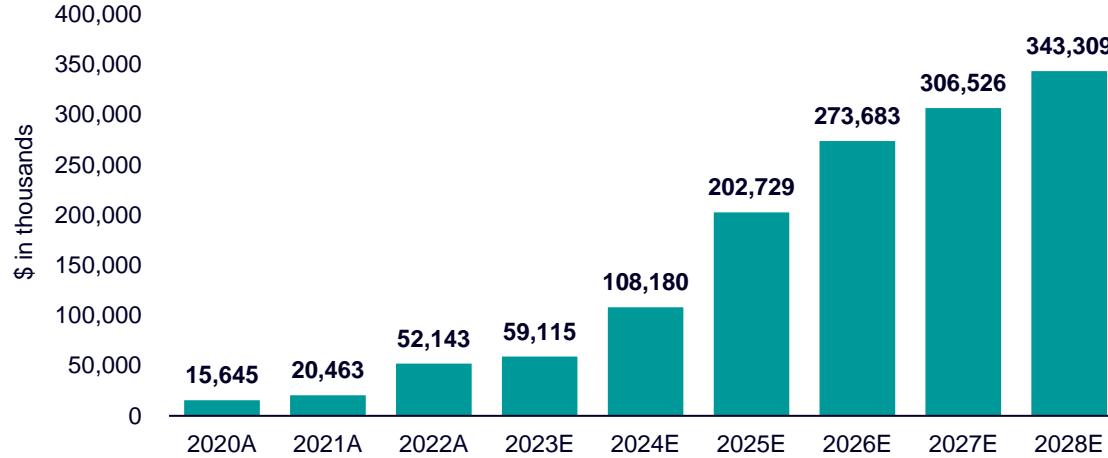
- Athena + PowerTrack can enable 500+ bps improvement in project IRRs by electing PTC in lieu of ITC

Stem Revenue Build

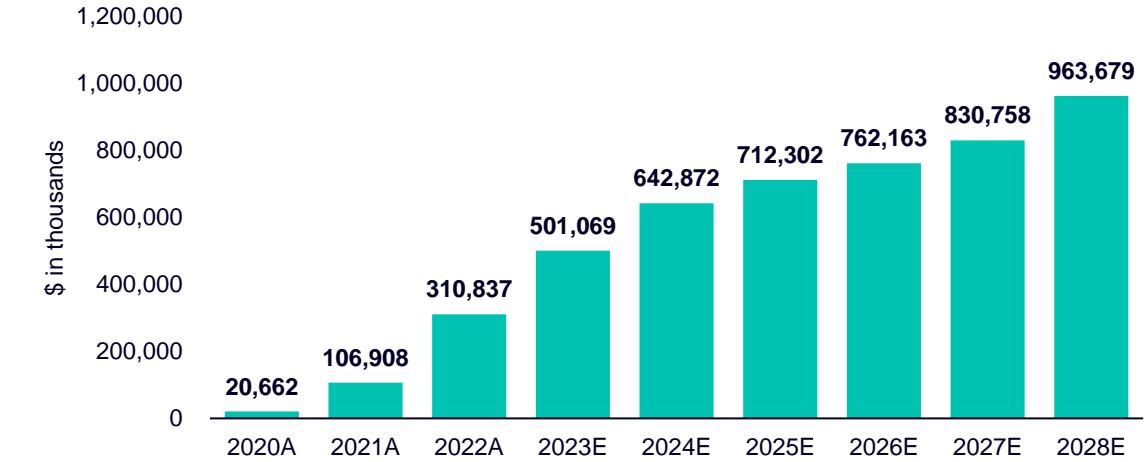
SIEMENS

Business segment and total revenue breakdown through 2028

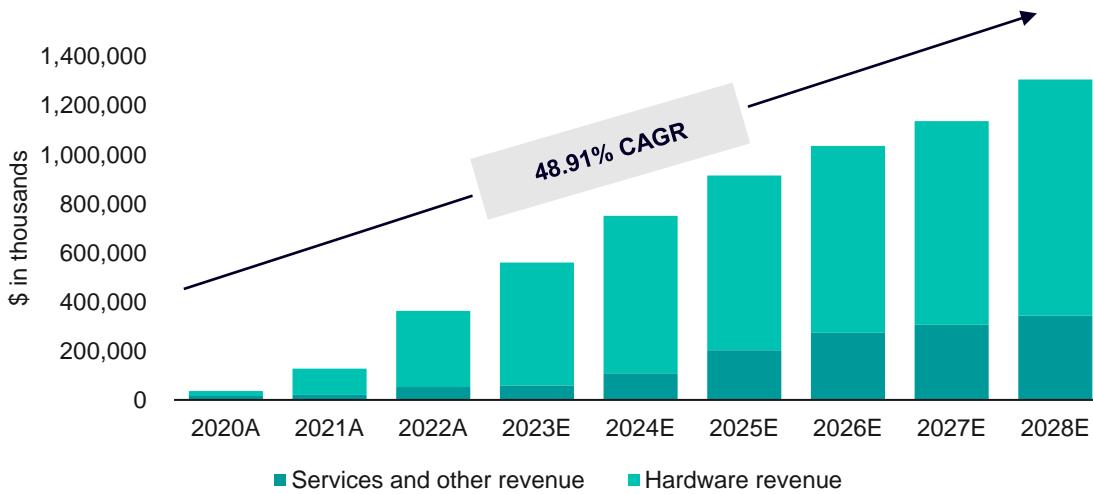
Services and Other Revenue



Hardware Revenue Breakdown



Total Revenue Breakdown Derived From Each Segment



Total Revenue Breakdown

- Total revenue is expected to grow across the projected 9-year period at a CAGR of 48.91% driven by heightened growth in both segments
- Both hardware revenue and services revenue are forecasted to significantly increase at a CAGR of 53.26% and 40.94% respectively
- Stem continues to highlight progress in the EV charging markets following its partnership with ChargePoint
- Given EV charging solutions can require systems sizes 2 – 5x larger, EV ventures are an important growth avenue
- Software fees associated with these projects can be 2x larger than a BTM storage deployment
- Successful cross-selling of AlsoEnergy customers for solar+storage applications

Source: (Bloomberg, 2023), (Cowen, 2023)

Valuation and Cost/Profit of Acquiring Stem (1/3)

SIEMENS

Discounted cash flow analysis

Fiscal Year Fiscal Year End Date	2021A 12/30/21	2022A 12/30/22	2023E 12/31/23	2024E 12/30/24	2025E 12/30/25	2026E 12/30/26	2027E 12/31/27	2028E 12/30/28
Revenue	36	127	560	751	915	1,036	1,137	1,307
% growth			(1) 339.8%	34.1%	21.8%	13.2%	9.8%	14.9%
Adj. EBITDA	(45)	(57)	(8)	48	113	199	269	340
% margin			(19.8%)	71.2%	113.4%	128.3%	74.1%	60.7%
Depreciation and amortization			(54)	(65)	(75)	(78)	(92)	(101)
Stock-based compensation			(28)	(27)	(30)	(31)	(30)	(30)
EBIT	(83)	(131)	(91)	(45)	8	91	147	209
Tax Rate	0.0%	(10.9%)	(9.0%)	(9.0%)	0.0%	0.0%	0.0%	0.0%
EBIAT (NOPAT)	(83)	(145)	(99)	(49)	8	91	147	209
Depreciation and amortization			(3) 54	65	75	78	92	101
Working Capital Items:			(10)	30	16	7	8	18
Unlevered CFO			(64)	76	115	183	254	346
Capital Expenditures			(25)	(34)	(42)	(47)	(52)	(60)
Unlevered FCF			(90)	42	73	135	202	286
% growth				(146.4%)	76.6%	84.5%	49.4%	41.5%
Discount factor			181%	281%	381%	481%	581%	681%
Assume cash flows are generated at:								
Midperiod adjustment factor			1.8	1.0	1.0	1.0	1.0	1.0
Present value of Unlevered FCF			(80)	31	49	80	105	132

Additional Commentary

- ① ▪ Significant growth projected due to the increased investment in solar energy and battery storage
 - Driven by hardware sales and technology related revenue in 2024
- ② ▪ Stock-based compensation treated as an expense for DCF valuation
 - Stem, Inc. has a significant amount of SBC, including it in the valuation better determines the fair value of the company
- ③ ▪ Stem, Inc. has significant D&A expense driven by the energy storage systems that the company owns
 - Growth in D&A expected as the company continues to grow revenue
- ④ ▪ Midperiod adjustment factor used to calculate present value of FCF
 - Assumed cash flows collected in the middle of the period as opposed to the end

Source: (Bloomberg, 2023)

Valuation and Cost/Profit of Acquiring Stem (2/3)

SIEMENS

WACC and Capitalization

Cost of Capital Assumptions

Pre-tax cost of debt	4.8%
Tax rate	0.0%
Risk free rate	3.9%
Beta	2.1
Market risk premium	5.9%
Cost of Debt	4.8%
Pre-tax cost of debt	4.8%
Tax rate	0.0%

After-tax cost of debt

Cost of Equity	16.1%
Risk free rate	3.9%
Beta	2.1
Market risk premium	5.9%
Cost of Equity	16.1%

Cost of Capital (WACC)

Capital weights	Amount	% of total
Market value of equity	1,208.8	73.5%
Market value of net debt	436.4	26.5%
Cost of capital (WACC)	13.1%	

Perpetuity and Exit EBITDA Sensitivity Analysis

	2.0%	2.5%	3.0%	3.5%	4.0%	
WACC:	13.5% 13.3% 13.1% 12.9% 12.7%	6.57 6.81 7.06 7.31 7.58	6.95 7.20 7.47 7.74 8.03	7.36 7.63 7.92 8.21 8.52	7.81 8.10 8.41 8.74 9.07	8.31 8.63 8.96 9.32 9.69
					Equity value per share	
					Exit EBITDA Multiple	
		7.8x 6.12 7.01 7.91 8.81	8.8x 6.38 7.31 8.23 9.15	9.8x 6.65 7.61 8.56 9.51	10.8x 6.94 7.92 8.90 9.88	12.8x 7.23 8.24 9.25 10.26
WACC:	14.1% 13.6% 13.1% 12.6% 12.1%					

- The Weighted Average Cost of Capital (WACC) represents return to lenders and shareholders
- Stem's WACC of 13.1% represents the required rate of return (discount rate) necessary for DCF analysis
- This also represents the fact that the company must pay investors an average of \$0.131 for every \$1.00 received in funding

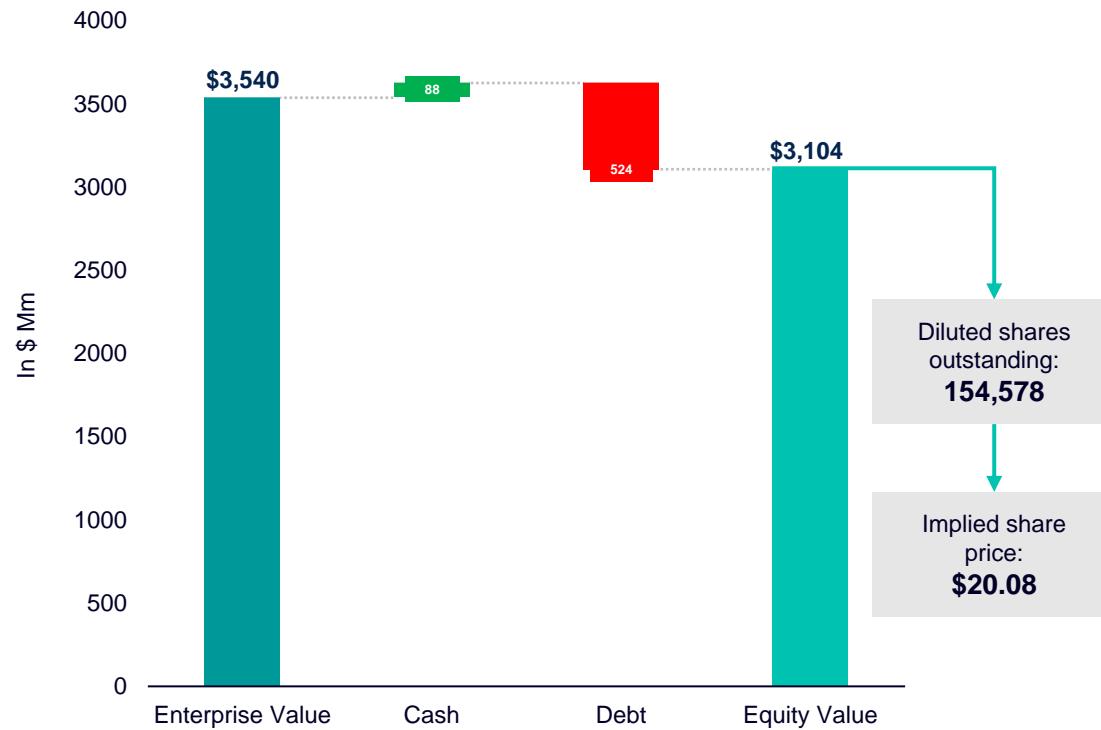
Source: (Bloomberg, 2023)

Valuation and Cost/Profit of Acquiring Stem (3/3)

SIEMENS

Fair enterprise value and football field

Enterprise to Equity Value Bridge



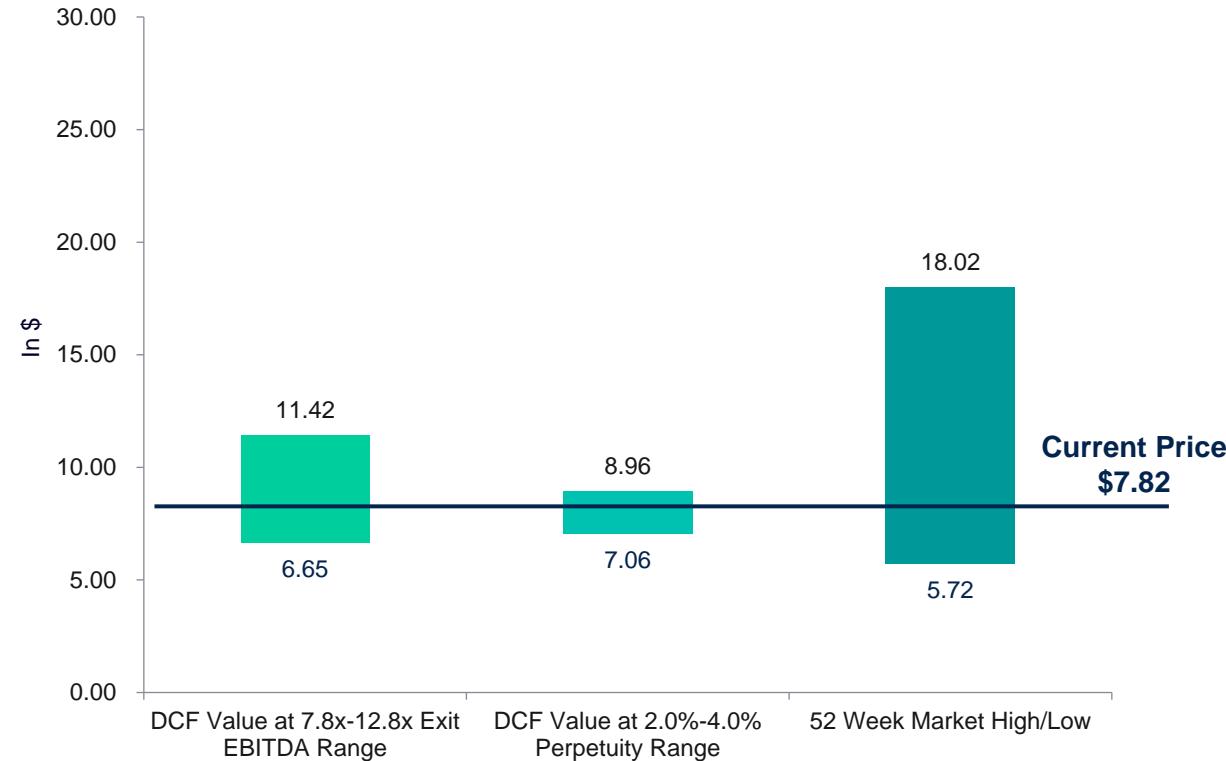
Current Enterprise Value: \$3.540Bn

+ Cash and Cash Equivalents: \$0.088

- Total Debt: \$0.524Bn

Equity Value: \$3.104Bn

Football Field



- Enterprise Value via Perpetuity Approach: \$1.66Bn
- Enterprise Value via Exit EBITDA Multiple Approach: \$1.71Bn
- Stem's DCF outputs indicate the company is **fairly valued** in relation to its current market valuation

Source: (Bloomberg, 2023)

Post Acquisition Strategy

By focusing on decarbonization initiatives Siemens will be better positioned

SIEMENS

Focusing on technology solutions for both commercial and residential



Enhance AI capabilities through a combined APM platform



Athena

- Software integrated with **solar energy systems**
- Lacks the functionality to interact with other renewable energy systems

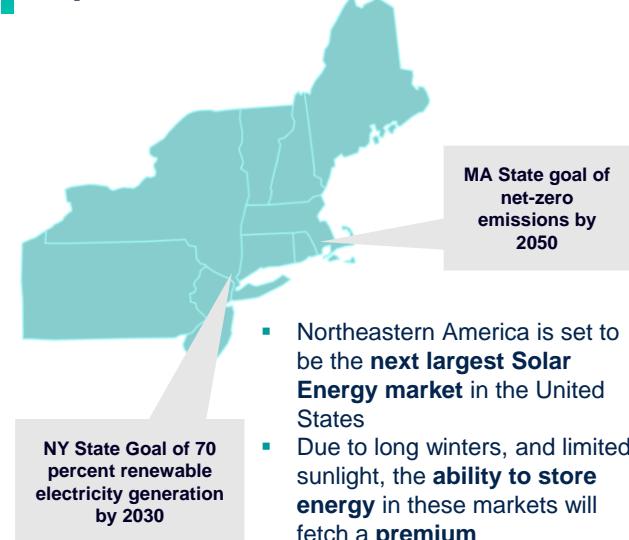
Combination

- Energy management in multiple clean energy markets
- Combined AI with enhanced automatic bidding process

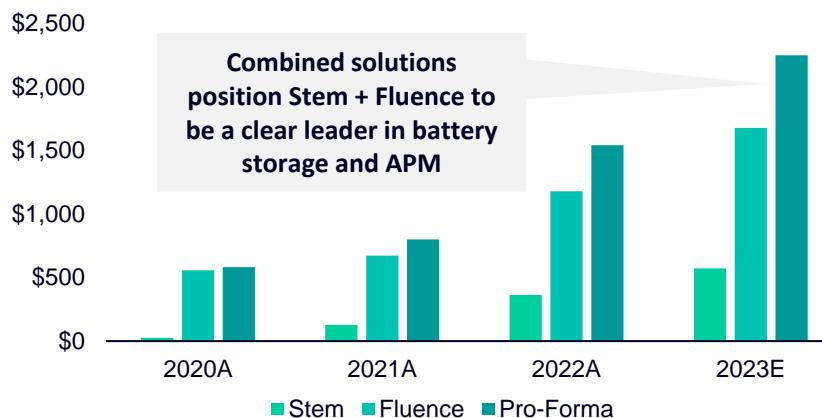
FluencelQ

- Advanced platform for **solar, wind, and energy** with value-add software applications
- 267 MW of storage assets under management

Capitalize on new solar markets



Building meaningful customer relationships to drive revenue growth in key areas



Diversifying revenue streams across essential business partners



Stem and Fluence have complimentary customers

- Stem captures **consumer brands**
- Fluence is heavy in **C&I**
- By combining both companies Siemens can have a **great presence in battery storage**

FLUENCE
A Siemens and AES Company

enel
LS POWER
Innovation and Investment in Energy

S-POWER
An AES and AIMCo Company

Source: (10-K (Stem, Inc. 2022)), (Investor Day (Stem, Inc. 2022)), (Suri, 2022), (Bloomberg, 2023), (Stem, Inc. 2023)

Conclusion





Product Integration

Competing visions

- Visions for both Siemens and Vestas revolve around the transition to renewable energy, but Siemens prioritizes smaller, more tech-focused businesses
- Siemens divested from wind power when the company spun-off the Gas & Power segment in 2020 to form Siemens Energy
- Acquiring Vestas would not align with the strategic goals of Siemens as the company tries to move away from capital intensive businesses

Why Stem is a better fit

- Siemens acquired Fluence, a global provider of energy storage products, services and AI in June of 2017
- Fluence cube technology combined with their Gridstack AI helps energy producers and providers in capacity efficiency, allowing producers to arbitrage price
- In conjunction with Fluence, Stem's products (specifically Athena) would integrate exceptionally well and create synergistic opportunities for Siemens



Financial Analysis

Not fiscally responsible.

- Vestas is a massive company. By moving forward with an acquisition of this size, Siemens would need to raise a significant portion of debt
- Moody's range for global industrials scorecard range for Debt/EBITDA is 1.6x-1.9x for A+ rating
- All scenarios where Siemens uses debt to finance this transaction leads to a credit rating downgrade ranging from **Baa3 – Ba2**

Stem offers greater upside potential

- By comparison, Stem is ~\$28Bn smaller by market capitalization
- Stem is currently trading at a discount relative to the discounted cash flow analysis
- The additive effect on Siemens current portfolio of energy storage systems deployed would make it the **largest pure play energy storage company in North America**



Synergistic Opportunities

Wind blows!

- Vestas primarily operates in onshore solutions (71.8% of revenues) and has made the decision to expand operation in offshore production
- Europe has seen a significant downturn in demand for wind solutions and is looking to alternative renewable energy
- As Vestas makes the transition to offshore, the company will experience difficulty competing against larger, more established offshore providers on top off a depleting demand for the product

Stem provides powerful synergies

- Solar energy and storage will see continued growth, and as adoption increases, energy management systems with access to the grid will be of high importance
- The Inflation Reduction Act in the United States offers a unique value proposition for those investing in and producing solar energy systems
- Stem's technology stack provides commercial customer with the flexibility to manage their stored energy, fitting seamlessly with Siemens infrastructure products

Appendix



Siemens + Stem | Merger Model

An acquisition of Stem would be accretive to Siemens' EPS on a pro forma basis

SIEMENS

Company profile

Siemens Financial Profile

Fully Diluted Shares Outstanding	800
Current Share Price	\$153.94
Equity Value	\$123,149
Forecasted Earnings Per Share (EPS) _{t + 1}	\$8.67
P/E Multiple	17.8x

Stem Financial Profile

Fully Diluted Shares Outstanding	155
Current Share Price	\$7.82
Equity Value	\$1,209
Forecasted Earnings Per Share (EPS) _{t + 1}	(\$0.71)
P/E Multiple	-11.0x

Transaction and financing assumptions

Transaction Assumptions

Offer Price Per Share	\$10.17
% Offer Premium	30.0%
Offer Value	\$1,571

Cash Consideration (All-Debt Funded)

Offer Value	\$1,571
% Cash	90.0%
Total Debt Financing	\$1,414
Financing Fee	\$94
Financing Fee % Total Debt	6.7%
Borrowing Term	20 Years
Financing Fee Amortization	\$5
% Interest Rate	5.1%
Annual Interest Expense	\$72

Source: (Bloomberg, 2023)

Accretion/dilution analysis

Accretion/Dilution Analysis

Acquirer Standalone Net Income	\$6,936
% Tax Rate	22.0%
Earnings Before Taxes (EBT)	\$8,893

Pro Forma Financials

Consolidated EBT	\$8,735
Less: Interest Expense and Financing Fees	(76)
Plus: Synergies, net	367
Less: Incremental Depreciation	(28)
Pro Forma Adjusted EBT	\$8,998
Less: Taxes	(1,980)
Pro Forma Net Income	\$7,019

Target Standalone Net Income	(\$124)
% Tax Rate	21.0%
Earnings Before Taxes (EBT)	(\$157)

Pro Forma EPS

Pro Forma Net Income	\$7,019
Pre-Deal Acquirer Shares Outstanding	800
Plus: New Shares Issuances	1
Pro Forma Diluted Shares	801
Pro Forma EPS	\$8.76
% Accretion / (Dilution)	1.1%

Accretive to pro-forma EPS by 1.1%

Form of Consideration

% Stock	10.0%
% Cash	90.0%

Stock Consideration

Offer Value	\$1,571
% Stock	10.0%

Stock Consideration

Number of Acquirer Shares Issued	1
----------------------------------	---

Deal Assumptions

Synergies, net	\$367
Transaction Fees	\$39
Transaction Fees % Offer Value	2.5%

Purchase Price Accounting

Offer Value	\$1,571
Less: Net Tangible Book Value	6

Purchase Premium

Less: PP&E Write-Up	(394)
Less: Intangibles Write-Up	(158)
Plus: Deferred Tax Liability (DTL)	121

Goodwill Created

Goodwill Created	\$1,146
-------------------------	----------------

Asset Write-Ups

% Allocation to PP&E	25.0%
Useful Life Assumption	20 Years

Incremental Depreciation

% Allocation to Intangibles	10.0%
Useful Life Assumption	20 Years

Incremental Amortization

Incremental Amortization	\$8
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Bibliography



Bibliography

- Aizarani, J. and 31, J. (2023) Europe: Fossil Gas Supply and Demand 2030, Statista. Available at: <https://www.statista.com/statistics/1313741/europe-fossil-gas-supply-and-demand/> (Accessed: March 8, 2023).
- Albidgren, K. (1970) Publications, Monetary History of Denmark 2005-2020. Available at: <https://www.nationalbanken.dk/en/publications/Pages/2023/03/Monetary-History-of-Denmark-2005-2020.aspx> (Accessed: March 8, 2023).
- Alex (2022). GWECs Global Offshore Wind Report 2022. [online] Global Wind Energy Council. Available at: <https://gwec.net/gwecs-global-offshore-wind-report/>.
- Bloomberg NEF. (2015). Bloomberg NEF. [online] Available at: <https://about.bnef.com/>. [Accessed 11 Mar. 2023]
- Boyes, T. (2023) 2H23 EBITDA profitability target reaffirmed; solid execution w/ growing backlog. Equity Research. Cowen. Available at: <https://www.cowen.com/capabilities/research/> (Accessed: March 11, 2023).
- Busch, R., Ag, S. and Thomas, R. (2023). Flying start to fiscal 2023 -Guidance raised. [online] Available at: <https://assets.new.siemens.com/siemens/assets/api/uuid:cada153e-39a3-491e-b9ad-64642d0ecdc0/2023-q1-p-presentation-en.pdf> [Accessed 12 Mar. 2023].
- Business Wire. (2021). Global Smart Grid Market Report 2021-2026: A \$55.9 Billion Market by 2026 - ResearchAndMarkets.com. [online] Available at: <https://www.businesswire.com/news/home/20211102005856/en/Global-Smart-Grid-Market-Report-2021-2026-A-55.9-Billion-Market-by-2026---ResearchAndMarkets.com> [Accessed 11 Mar. 2023].
- Christakou, N. (2022) Renewable-energy development in a net-zero world: Land, permits, and grids, McKinsey & Company. McKinsey & Company. Available at: <https://www.mckinsey.com/industries/electric-power-and-natural-gas/our-insights/renewable-energy-development-in-a-net-zero-world-land-permits-and-grids> (Accessed: March 8, 2023).
- Climate Tech VC. (2022). Buildings as Power Plants. [online] Available at: <https://www.ctvc.co/buildings-as-power-plants/> [Accessed 12 Mar. 2023].
- Damodaran , A. (2023) Cost of equity and Capital (US), Cost of Capital. Available at: https://pages.stern.nyu.edu/~adamodar/New_Home_Page/datafile/wacc.html (Accessed: March 8, 2023).
- Deloitte (2022) 2023 Renewable Energy Industry Outlook, Deloitte United States. Available at: <https://www2.deloitte.com/us/en/pages/energy-and-resources/articles/renewable-energy-outlook.html> (Accessed: March 8, 2023).
- EIA.gov. (n.d.). Form EIA-860 detailed data with previous form data (EIA-860A/860B). [online] Available at: <https://www.eia.gov/electricity/data/eia860/>.
- Ember. (2023). European Electricity Review 2023. [online] Available at: <https://ember-climate.org/insights/research/european-electricity-review-2023/>.
- Energy Europa (2022) Energy Performance of Buildings directive, Energy Europa. Available at: https://energy.ec.europa.eu/topics/energy-efficiency/energy-efficient-buildings/energy-performance-buildings-directive_en (Accessed: March 8, 2023).
- Energy Europa (2023) How much gas have the EU countries stored?, Consilium. Available at: <https://www.consilium.europa.eu/en/infographics/gas-storage-capacity/#:~:text=The%20regulation%20has%20been%20swiftly,filling%20level%20remains%20above%2080%25>. (Accessed: March 8, 2023).
- EuroStat (2023). Available at: https://ec.europa.eu/eurostat/databrowser/view/NRG_CB_GASM_custom_5035557/default/table?lang=en [Accessed 11 Mar. 2023].
- Europa. (n.d.). How much gas have the EU countries stored? [online] Available at: <https://www.consilium.europa.eu/en/infographics/gas-storage-capacity/#:~:text=The%20regulation%20has%20been%20swiftly>. (accessed: March 11, 2023).
- European Central Bank (2023) ECB euro reference exchange rate: US Dollar (USD), European Central Bank. Available at: https://www.ecb.europa.eu/stats/policy_and_exchange_rates/euro_reference_exchange_rates/html/index.en.html (Accessed: March 10, 2023).
- Ferris, N. (2021). The quest to generate zero-impact renewable power. [online] Energy Monitor. Available at: <https://www.energymonitor.ai/tech/renewables/the-quest-to-generate-zero-impact-renewable-power/> [Accessed 11 Mar. 2023].
- GIE (2022) Storage database, Gas Infrastructure Europe. Available at: <https://www.gie.eu/transparency/databases/storage-database/> (Accessed: March 12, 2023).
- Global Data (n.d.). ShieldSquare Captcha. [online] Available at: <https://www.globaldata.com/media/power/vestas-establishes-leading-global-wind-turbine-manufacturer-2021-says-globaldata/>.
- Global Wind Energy Council. (2022). Global Wind Report 2022. [online] Available at: <https://gwec.net/global-wind-report-2022/>.
- Globalwitness.org. (2023). Available at: https://www.globalwitness.org/documents/20351/Supporting_fossil_hydrogen_would_keep_the_EU_hooked_on_gas_imports_.pdf [Accessed 11 Mar. 2023].
- Gudin, P. (2023) Europe's great green spending spree, Barclays Cross Asset Research. Barclays . Available at: <https://live.barcap.com/publiccp/RSR/nyfipubs/barcap/researchbrochure/> (Accessed: February 27, 2023).
- Gupta, A. (2023) Vestas Optimism or inflection? History is instructive. Stay UW, J.P. Morgan Equity Research. Available at: <file:///C:/blp/data/JP%20Morgan%20VWS@DC%20Vestas%20Optimism%20or%20inflection%20History%20is%20instructive..pdf> (Accessed: March 8, 2023).
- Heineke, F. (2022) Renewable-energy development in a net-zero world, McKinsey & Company. McKinsey & Company. Available at: [https://www.mckinsey.com/industries/electric-power-and-natural-gas/our-insights/renewable-energy-development-in-a-netzero-world](https://www.mckinsey.com/industries/electric-power-and-natural-gas/our-insights/renewable-energy-development-in-a-net-zero-world) (Accessed: March 8, 2023).

Bibliography

- IEA (2021) Global Energy Review 2021 . Available at: <https://iea.blob.core.windows.net/assets/d0031107-401d-4a2f-a48b-9eed19457335/GlobalEnergyReview2021.pdf> (Accessed: March 8, 2023).
- IEA (2022) Smart grids – analysis, IEA. Available at: <https://www.iea.org/reports/smart-grids> (Accessed: March 8, 2023).
- IEA (2022) World Energy Outlook 2022 – analysis, IEA. Available at: <https://www.iea.org/reports/world-energy-outlook-2022> (Accessed: March 8, 2023).
- Innovation News Network. (2023). Renewable energy sources provide 66 GW boost to global power grid in 2022. [online] Available at: <https://www.innovationnewsnetwork.com/renewable-energy-sources> [Accessed 11 Mar. 2023].
- IRENA (2019). FUTURE OF WIND Deployment, investment, technology, grid integration and socio-economic aspects A Global Energy Transformation paper About IRENA. [online] Available at: https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2019/Oct/IRENA_Future_of_wind_2019.pdf.
- IRENA (2022). Renewable Power Generation Costs in 2021. [online] Available at: <https://www.irena.org/publications/2022/Jul/Renewable-Power-Generation-Costs-in-2021>.
- Jocelyn, V. and Biagi, L. (2022) Charging infrastructure in the United States, Statista. Available at: <https://www.statista.com/study/109274/charging-infrastructure-in-the-united-states/?locale=en> (Accessed: March 8, 2023).
- Jocelyn, V. and Biagi, L. (2022) Smart grids in the U.S., Statista. Available at: <https://www.statista.com/study/12257/smart-grids-in-the-united-states-statista-dossier/?locale=en> (Accessed: March 8, 2023).
- Jones, D. (2023) European Electricity Review 2023, Ember. Available at: <https://ember-climate.org/insights/research/european-electricity-review-2023/> (Accessed: March 8, 2023).
- McKinsey & Company (2022). IRA: The Inflation Reduction Act by the numbers | McKinsey. [online] www.mckinsey.com. Available at: <https://www.mckinsey.com/industries/public-and-social-sector/our-insights/the-inflation-reduction-act-heres-whats-in-it>.
- McKinsey & Company (n.d.). Asia's \$5 trillion green business opportunity | McKinsey. [online] Available at: <https://www.mckinsey.com/featured-insights/future-of-asia/green-growth-capturing-asias-5-trillion-green-business-opportunity>. (Accessed March 8, 2023)
- Moody's (2022) Siemens Aktiengesellschaft: Reports: Moody's, Siemens Aktiengesellschaft | Reports | Moody's. Available at: <https://www.moodys.com/credit-ratings/Siemens-Aktiengesellschaft-credit-rating-676500> (Accessed: March 8, 2023).
- NextMSC. (n.d.). Electric Vehicle Supply Equipment Market Analysis - 2030. [online] Available at: <https://www.nextmsc.com/report/electric-vehicle-supply-equipment-market> [Accessed 11 Mar. 2023].
- Owens, T. (2023) Siemens AG - employees by segment, Statista. Available at: <https://www.statista.com/statistics/292367/number-of-siemens-employees-by-segment/> (Accessed: March 8, 2023).
- Precision Business Insights. (n.d.). Microgrid Market: Global Market Estimation, Dynamics, Regional Share, Trends, Competitor Analysis (2017-2021) and Forecast (2022-2028). [online] Available at: <https://precisionbusinessinsights.com/market-reports/microgrid-market/> [Accessed 11 Mar. 2023].
- PwC (2022) Sustainable cities tackling climate change through Urban Energy Transition, PwC. Available at: <https://www.pwc.com/gx/en/issues/esg/the-energy-transition/sustainable-cities-tackling-climate-change-through-urban-energy-transition.html> (Accessed: March 8, 2023).
- Djunisic, S. (n.d.). Vestas back on throne as world installs almost 100 GW of turbines in 2021. [online] Available at: <https://renewablesnow.com/news/vestas-back-on-throne-as-world-installs-almost-100-gw-of-turbines-in-2021-778214/>.
- S&P Global (2022) RatingsDirect, Bonds & Rating | Siemens Shareholder Services . Available at: <https://assets.new.siemens.com/siemens/assets/api/uuid:0104f68f-6a0a-44b8-93ee-a6b82358c0a2/S-P-Siemens-rating.pdf> (Accessed: March 8, 2023).
- Siemens (2021) Siemens Capital Markets Day, Siemens Investor Relations. Available at: <https://assets.new.siemens.com/siemens/assets/api/uuid:abe8bc12-0e92-4ec1-a822-01c9481e0028/HQCOPR202106236238EN.pdf> (Accessed: March 8, 2023).
- Siemens (2022) Full siemens report, Full Siemens Report. Available at: https://www.siemens.com/applications/b09c49eb-3a14-73b3-9f71-e30e3c2dfdbd/assets/pdfs/en/Siemens_Report_FY2022.pdf?ste_sid=5d1448f9635b8b456bd76bc6395c16b0 (Accessed: March 8, 2023).
- Siemens (2023) Siemens Form 13-F, Edgar filing documents for 0000950123-23-002809. Available at: <https://www.sec.gov/Archives/edgar/data/940418/000095012323002809/0000950123-23-002809-index.htm> (Accessed: March 8, 2023).
- Siemens (2023). Siemens. [online] www.siemens.com. Available at: <https://www.siemens.com/global/en.html> (Accessed: March 12, 2023)
- Siemsen, B. (2022) National accounts, Documentation of statistics: National Accounts - Statistics Denmark. Available at: <https://www.dst.dk/en/Statistik/dokumentation/documentationofstatistics/national-accounts> (Accessed: March 8, 2023).
- Smart Grid System Report 2018 Report to Congress. (2018). Available at: https://www.energy.gov/sites/prod/files/2019/02/f59/Smart%20Grid%20System%20Report%20November%202018_1.pdf [Accessed 8 Mar. 2023].
- Smitt, S. (2022) The Net-zero transition: What it would cost, what it could bring: Sustainability, McKinsey & Company. Available at: <https://www.mckinsey.com/capabilities/sustainability/our-insights/the-net-zero-transition-what-it-would-cost-what-it-could-bring> (Accessed: March 8, 2023).

Bibliography

- Suri, S. (n.d.). Buildings as Power Plants. [online] equalventures.substack.com. Available at: <https://equalventures.substack.com/p/buildings-as-power-plants> [Accessed 11 Mar. 2023].
- SmartGrid.Gov. (2019). Smart Grid Investment Grant Program: Overview: Recovery Act | SmartGrid.gov. [online] Available at: https://www.smartgrid.gov/recovery_act/overview/smart_grid_investment_grant_program.html. (Accessed: March 11, 2023).
- Solar Energy Technologies Office (2021). Solar Futures Study. [online] Energy.gov. Available at: <https://www.energy.gov/eere/solar/solar-futures-study>. (Accessed: March 11, 2023).
- Statista. (n.d.). Microgrid capacity additions in the U.S. 2025. [online] Available at: <https://www.statista.com/statistics/759968/microgrid-capacity-additions-in-the-us/> [Accessed 11 Mar. 2023].
- Stem Inc. 10-K (2023) Edgar Entity Landing Page. Available at: <https://www.sec.gov/edgar/browse/?CIK=1758766&owner=exclude> (Accessed: March 8, 2023).
- Stem, Inc. (2022) Stem Investor & Analyst Day 2022, [PowerPoint Presentation \(q4cdn.com\)](#). Available at [PowerPoint Presentation \(q4cdn.com\)](#) (Accessed: March 8, 2023).
- Stem, Inc. (2022) Stem Investor Day 2022, https://s27.q4cdn.com/138752898/files/doc_financials/2022/q4/Stem-Q4-2022-supplement-vF.pdf. Available at: https://s27.q4cdn.com/138752898/files/doc_financials/2021/q4/Stem-Q4-2021-supplement-vF.pdf (Accessed: March 8, 2023).
- Stem, Inc. (2018). Stem | Operating the world's smartest energy storage network. [online] Stem | Operating the world's smartest energy storage network. Available at: <https://www.stem.com/>.
- Suri, S. and Zullo, R. (2022) Buildings as power plants, Buildings as Power Plants - by Simran Suri and Rick Zullo. Equal Ventures. Available at: <https://equalventures.substack.com/p/buildings-as-power-plants> (Accessed: March 8, 2023).
- Szymanska, Z. (2022) Germany aims to get 100% of energy from renewable sources by 2035, Reuters. Thomson Reuters. Available at: <https://www.reuters.com/business/sustainable-business/germany-aims-get-100-energy-renewable-sources-by-2035-2022-02-28/> (Accessed: March 8, 2023).
- Thornton, M. (2023) China drives global wind turbine orders to new record in 2022, Wood Mackenzie. WoodMac.Site.Features.Shared.ViewModels.Metadata.Publisher. Available at: <https://www.woodmac.com/press-releases/china-drives-global-wind-turbine-orders-to-new-record-in-2022/> (Accessed: March 8, 2023).
- Vaziri, O. (2023) Bloomberg European Industrials Overview, Bloomberg Intelligence. Bloomberg . Available at: <file:///C:/blp/data/2023%20Outlook%20Europe%20Industrials.html> (Accessed: March 3, 2023).
- Vaziri, O. (2023) Siemens Company Outlook, Bloomberg Intelligence. Bloomberg. Available at: <file:///C:/blp/data/Siemens%20Company%20Outlook.html> (Accessed: March 1, 2023).
- Vestas (2022) Vestas. Available at: <https://www.vestas.com/content/dam/vestas-com/global/en/investor/reports-and-presentations/financial/2021/vestas-annual-report-2021.pdf.coredownload.inline.pdf> (Accessed: March 12, 2023).
- Vestas (2022) Vestas. Available at: [Vestas Annual Report 2022 \(1\).pdf](Vestas%20Annual%20Report%202022%20(1).pdf) (Accessed: March 12, 2023).
- Vestas (2023). Vestas. [online] www.vestas.com. Available at: <https://www.vestas.com/en> (Accessed: March 12, 2023).
- WINDEExchange. (n.d.). WINDEExchange: Production Tax Credit and Investment Tax Credit for Wind. [online] Available at: <https://windexchange.energy.gov/projects/tax-credits#:~:text=The%20Production%20Tax%20Credit%20> (Accessed: 8 March 2023)
- Wood Mackenzie (2022). Electric Vehicles: What you need to know. [online] Available at: <https://www.woodmac.com/market-insights/topics/electric-vehicles/>. (Accessed: 8 March 2023)
- Wood Mackenzie (2023) Renewable Power Competitiveness in Asia Pacific worsened in 2022, Wood Mackenzie. WoodMac.Site.Features.Shared.ViewModels.Metadata.Publisher. Available at: <https://www.woodmac.com/press-releases/renewable-power-competitiveness-in-asia-pacific-worsened-in-2022/> (Accessed: March 8, 2023).
- Wood Mackenzie (2023). US microgrid market develops at rapid pace, with capacity reaching 10 GW in 2022. [online] www.woodmac.com. Available at: <https://www.woodmac.com/press-releases/us-microgrid-market-develops-at-rapid-pace--with-capacity-reaching-10-gw-in-2022/> (Accessed: Accessed March 11 2023).