



# CFA Institute

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## CFA Institute Research Challenge

hosted by  
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Team A – BI Norwegian Business School

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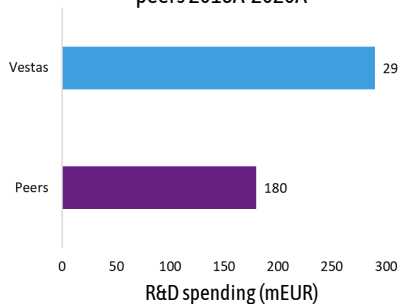
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RECOMMENDATION	BUY
Date	10.02.2021
Current Price	DKK 1229
Target Price	DKK 1480
Upside	21%
Industry	Energy
Sector	Wind
Ticker	VWS.CO
Stock Exchange	Nasdaq Copenhagen

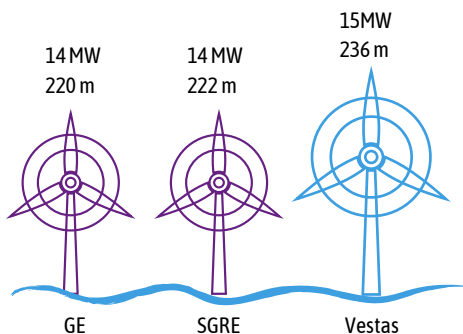
Shares Outstanding	202m
Market Capitalization	DKK 248bn
EPS (2020)	EUR 3.9
Free Float	201m

Figure 1: Vestas invested 60% more in R&D than peers 2016A-2020A



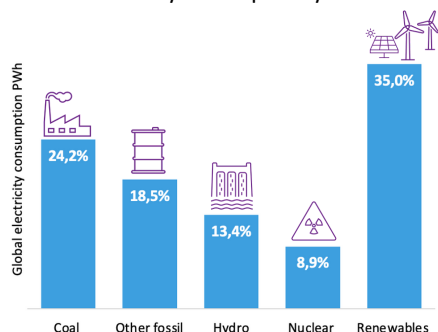
Source: Team Analysis, Bloomberg

Figure 2: Peer comparison of offshore turbines by nominal capacity and rotor diameter



Source: Company Data

Figure 3: Renewables set to comprise 35% of total electricity consumption by 2035



Source: IRENA

Vestas is the leading powerhouse in the wind Original Equipment Manufacturer (OEM) market, offering premium turbines along with service solutions. With leadership track record and best-in-class technology, we believe Vestas's true value lies North of its current price.

## INVESTMENT SUMMARY

We issue a **BUY** recommendation for Vestas with a one-year target price of DKK 1480, presenting an 21% upside potential on the closing price of DKK 1229 on February 10th 2021. The target price is based on a Discounted Cash Flow method (DCF) and supported by Relative Valuation. Our recommendation lays on the following key catalysts: (1) Vestas' technology moat unlocking a higher pricing potential, (2) its offshore expansion maximizing shareholder returns, and (3) its unique position to capitalize on the renewable transition.

### TECHNOLOGY MOAT UNLOCKS HIGHER PRICING POTENTIAL

If one label was to define Vestas, then that label should be technology. However, we believe the market has underappreciated Vestas' technology focus despite all its business segments having a tech-nexus. Vestas stands out among both wind and other energy manufacturers as a company that consistently allocates its R&D budget more efficiently than competitors (Figure 1). This is paramount as auctions are won by OEMs that have the technological solution which provides the lowest Levelized Cost of Electricity (LCOE). LCOE is defined as the average cost of power over the entire turbine's lifetime, accounting for both the upfront purchase price and the accompanying maintenance cost. Vestas' rapid pace of innovation allows it to continuously reduce its LCOE, staying ahead of peers. We believe Vestas is currently reaping the rewards of these targeted tech investments, and will continue to do so in future, unlocking its true price potential. Key areas where Vestas' innovation excels are:

- Harnessing the power of hybrid solutions, which involve multiple renewables to create a more consistent supply of energy
- Building a highly integrated and digitized supply chain, which allows the company to offer superior modular components at a lower cost than rivals through in-house expertise
- State-of-the-art service, powered by the largest data collection in the industry, which enables Vestas to provide predictive analytics, maintenance, power forecasting and critical business decision-making through machine learning algorithms

### OFFSHORE EXPANSION MAXIMIZES SHAREHOLDER RETURNS

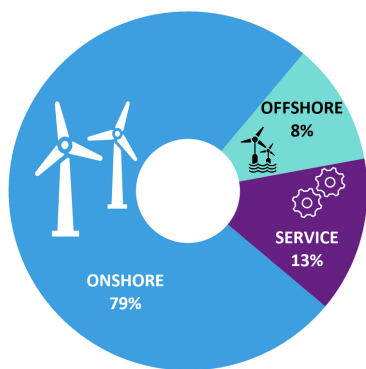
The majority of value creation in the offshore segment will be generated through service, which we believe is a fact largely overlooked by investors. Compared to onshore, the harsh marine conditions require more frequent turbine maintenance which translates into higher offshore revenue. This will be Vestas' competitive edge, as it is the only player with a global service infrastructure that offers best-in-class service, a synergy we expect to materialize post-acquisition. Vestas will further benefit from MHI Vestas Offshore Wind's (MVOW) decision to use onshore components in its offshore turbines, sacrificing initial costs for long term margins. This will lower future costs as Vestas experiences strong economies of scale by producing the same components for both segments. Following the recent launch of the world's largest offshore wind turbine of 15 MW, Vestas is well on track to capture the wave of new projects planned for 2024-2026 (Figure 2). In combination, we expect these factors to make offshore a significant profit driver for Vestas, estimated to grow at a CAGR of 24% between 2020-2026. With offshore set to become a USD 1tn industry by 2040 this can create a high long-term upside.

### UNIQUELY POSITIONED TO CAPITALIZE ON THE RENEWABLE TRANSITION

We believe investors have underestimated Vestas' position as the prime beneficiary of investments aimed at the renewable energy transition. Renewables are set for an explosive growth over the next decades, with trillions pouring in from governments and corporations in the pursuit of a sustainable future (Figure 3). Wind is the most attractive source among renewables as a result of its more consistent power output and lower LCOE. We therefore expect wind to capture a large portion of the renewable investments. Being the global leader in onshore wind who controls 46% of the market (excl. China), we believe Vestas will be one of the main recipients of international climate commitments. The company is setting the industry standard within ESG, already on track to becoming both carbon neutral by 2030 and producing zero-waste turbines by 2040. Utilizing technology to stay ahead of rivals, it is heavily investing in hybrid solutions to remain a key piece of the renewable transition. Vestas is currently priced similarly to competing wind and solar OEMs. Nonetheless, as a market leader in wind, with flagship ESG status, offering high-end technology, we believe Vestas deserves to be priced at a premium.

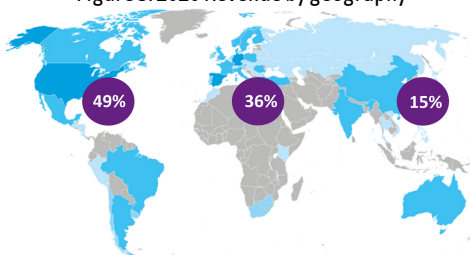
## BUSINESS DESCRIPTION

Figure 4: 2020 Revenue by business segment



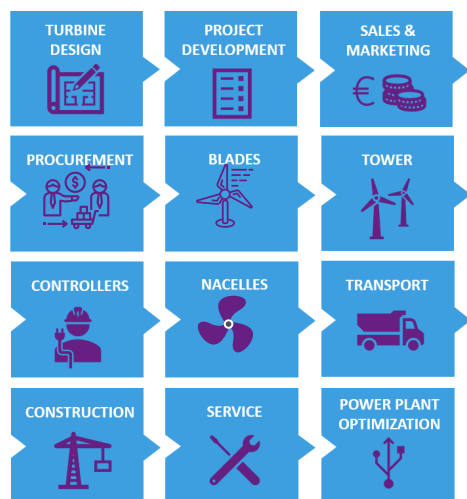
Source: Company Data

Figure 5: 2020 Revenue by geography



Source: Company Data

Figure 6: Vestas' integrated supply chain



Source: Company Data, Team Analysis

More details in Appendix B1

Vestas is a global wind turbine manufacturer and service provider, headquartered in Aarhus, Denmark. Originally producing industrial products, Vestas pivoted to manufacturing wind turbines in the late 1970s and currently has over 29k employees. With a high degree of vertical integration, Vestas develops, manufactures, assembles, transports, installs, and services wind turbines. Manufacturing, testing, and assembly facilities are spread across four different continents. Vestas reported EUR 14.8bn in total revenue, delivered a record 17.2 GW of turbine capacity and had an all-time high order backlog of EUR 42.9bn wind turbines and services combined in 2020.

### BUSINESS SEGMENTS & GEOGRAPHIC REACH

The company's main businesses areas are the onshore, service and offshore segments. Onshore accounts for 79% of revenue, followed by 13% from service and 8% from offshore (Figure 4). Vestas' customers are spread across the globe with 49% of revenues coming from Americas, 36% from EMEA, and 15% from Asia Pacific in 2020 (Figure 5). Vestas has hundreds of global sub-suppliers augmenting its global manufacturing capabilities. With less than 5% of cost concentrated in any one supplier, the broad geographic diversification of suppliers and customers helped Vestas avoid major supply chain bottlenecks during the Covid-19 pandemic. To date, Vestas installed more than 129 GW and serviced 117 GW of wind power in 83 different countries.

### PRODUCT HIGHLIGHTS AND VERTICALLY INTEGRATED VALUE CHAIN

The company distinguishes itself by offering end-to-end solutions, starting from turbine design, component manufacturing and construction to service and power plant optimization (Figure 6). The highly integrated value chain gives Vestas full control of component design, product quality, and delivery time. By producing the principal components of the turbine itself, Vestas retains its high level of manufacturing know-how and reduces its supplier dependence. Products in Vestas' power segment are categorized by rated nominal power (MW) and rotor diameter (meters). Vestas offers 2 MW, 4 MW, and 6 MW onshore platforms which are tailored to low, medium, and high-speed locations. The newly launched V236-15.0 MW is a flagship product, which the offshore wind industry witnessed for the first time (Appendix B2). The EnVentus platform is another breakthrough in Vestas' product portfolio, allowing for design modularity and customization, reducing project development costs (Appendix B3). Within Vestas' service segment, warranties are offered for Vestas and competitors' turbines in standard and customized packages, termed Active Output Management (AOM). Of the 117 GW serviced by Vestas, 11 GW (9%) are competitor's turbines.

### COMPANY STRATEGY

The company's corporate strategy is to maintain its position as a leading global sustainable energy manufacturer (Appendix B4). Central to this goal is to invest more in technology than its rivals and to stay ahead of competition. The three main areas at which we see the future R&D being directed at are hybrid solutions, further digitization of the supply chain and predictive analytics, which are its main differentiators from competitors. Recognizing the global trend towards unsubsidized wind projects, Vestas believes technology will allow it to outpace the market.

### ACQUISITION OF MHI VESTAS

In December 2020, Vestas finalized its acquisition of MVOW, purchasing the remaining shares in the joint venture from MHI for 2.5% of Vestas' recapitalized shares (~5m) valued at EUR 709m. We believe this acquisition occurred at a deep discount as MHI Vestas was bought at a lower 2020 P/E multiple of 31.5 compared to Vestas' P/E of 59. We believe Vestas had 5 key objectives in mind for the acquisition: 1) to capture the anticipated growth of 11.5% CAGR in offshore wind over the next two decades, 2) to realize synergies between onshore and offshore design, manufacturing and managerial know-how required for the 15 MW turbine launch's commercial success, 3) to broaden its customer base and establish offshore leadership, 4) to benefit from the geographic synergies based on close proximity between production facilities and the largest offshore wind markets in Europe, and 5) to expand into a new service revenue stream on the back of high offshore maintenance requirements (Appendix B5). The recent highlight of Vestas' offshore journey is its launch of the new V236-15.0 MW turbine on Feb. 10th, 2020, which outshines Siemens Gamesa Renewable Energy (SGRE) and GE's 14 MW turbines (Figure 2).

## ENVIRONMENTAL, SOCIAL AND GOVERNANCE

Vestas consistently delivers better on ESG aspects compared to peers (Appendix C1) and we expect this to continue in the future as a consequence of the company's continuous effort and improvement.

### ENVIRONMENT

Operating in the wind energy industry, Vestas is by default contributing to a more sustainable environment (Figure 7). Within the wind industry, Vestas' stated environmental goals are more ambitious than competitors and the company is making good progress in reaching these goals (Appendix C2). Vestas pledges to become carbon-neutral by 2030, without using carbon offsets, and to

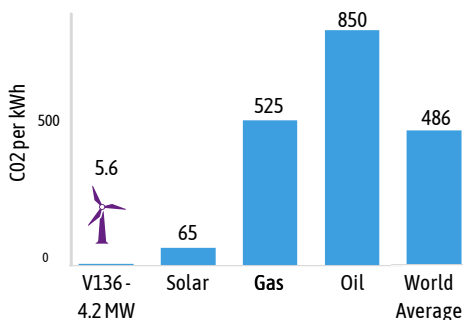
Figure 7: Sustainability at Vestas



Source: Company Data

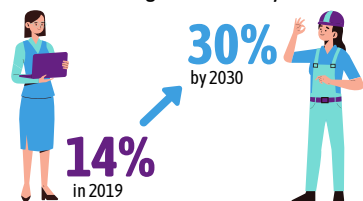
More details in Appendix C4

Figure 8: Vestas turbine CO2 emissions/kWh compared to alternative sources



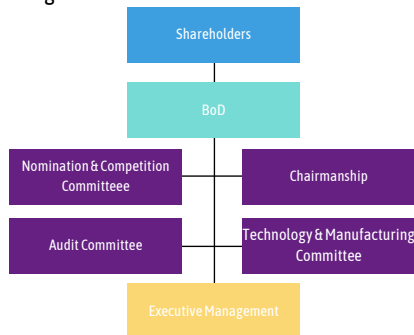
Source: Company Data, Team Analysis

Figure 9: Vestas on the right track to meet its 30% female gender ratio by 2030



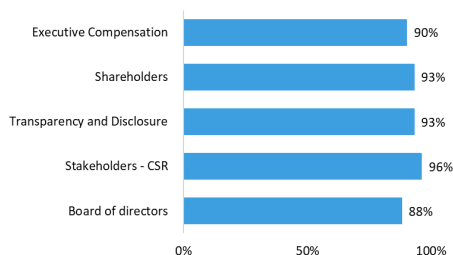
Source: Company Data

Figure 10: Vestas' Governance Structure



Source: Company Data

Figure 11: Governance Score Card



Source: Company Data, Team Analysis

produce zero-waste wind turbines by 2040 (Figure 8). In response to its higher-than-peer emission and waste intensity ratios, Vestas has implemented internal waste management programs to increase the recyclability ratio of its wind turbines. In 2020, Vestas' sustainability report noted that 63m tons of waste was recycled and 100% of utilized electricity came from renewable sources. We believe Vestas is on track to realize ESG synergies through lowering its global production footprint coupled with 3D additive manufacturing. Vestas' production facilities cover 38% more countries than SGRE, allowing the company to reduce waste generated by shipping components. The company's heavy investment in 3D additive manufacturing will further lower the footprint, as it enables it to produce locally.

## SOCIAL

Vestas is enhancing long-term shareholder return by its commitment to social responsibility. They prioritize local customers, suppliers and invest in local communities. Specifically, Vestas' investments in suppliers from emerging markets have been tremendously important in regional socio-economic development. Vestas' employees represent more than 100 nationalities, ensuring cultural diversity and allowing the company to support an expansive supply-chain and customer network. To maintain high quality partnership with suppliers, Vestas established a Business Partner Code of Conduct and regularly screens its suppliers. In 2020, Vestas screened close to 3000 suppliers, conducted 39 on-site reviews and 44 compliance audits. Vestas has a lower-than-average female gender ratio, but is committed to seek female talents over time (Figure 9). In 2020, females represented 14% of Vestas' employees compared to a wind industry average of 21%. To address this imbalance, Vestas pledges to increase the female gender ratio to 30% by 2030, which we believe is obtainable (Appendix C3). With strong occupational hazard safety, Vestas' lost-time injury (LTI) metric makes it one of the safest wind turbine manufacturers in the industry. The company reported a LTI of 1.0 in 2020, down nearly 30-fold from its 2005 LTI of 33.8. Following a 2015 scandal involving fraudulent transactions in India, Vestas developed an Anti-Bribery and Corruption Compliance Campaign.

## GOVERNANCE

We believe Vestas has an exemplary governance structure facilitating future growth (Figure 10). The evaluation is based on five factors: the board of directors (BoD), executive management and compensation, shareholder rights, transparency and disclosure, and sustainability. We assign a high score of 92/100 in corporate governance based on these factors (Figure 11, Appendix C2). Their governance structure is in-line with Scandinavian standards and allows the company to effectively conduct business globally. The company is regulated according to Danish law and it structures executive management based on Western European norms including a two-tier BoD and executive management. Company by-laws prevent dual membership on these bodies supporting independent checks and balances. In 2020, insiders purchased a net amount of 13,775 (5,799 purchased, 19,435 vested, 11,459 sold) shares which confirms their belief of further share price appreciation.

**Board of directors:** Vestas' BoD has eleven members possessing knowledge and experience from various relevant fields strengthening Vestas' position for future challenges and opportunities (Appendix C5). In 2020, four non-executive Vestas employees were represented on the board, with the remaining seven all being independent, supporting unbiased value-creating decision making. However, all four are Danish and we believe having multinational employee representatives will enhance the governance further. In addition, 33% of the board members are women, a gender ratio which we think can be improved. Two board members currently do not hold shares. We suggest that all board members hold Vestas shares in order to act in the best interest of shareholders.

**Executive Management:** The executive management comprises seven members, 30% of which are females, managing the day-to-day operations. The executive team is highly experienced and has relevant education background in their specialized fields, including finance, technology and sales, which contributes to Vestas reaching its goals and vision (Appendix C6).

**Remuneration:** Remuneration is regulated by an internal policy which dictates the fixed and variable remuneration components. Most variable remunerations are subject to a minimum EBIT margin, and cash bonuses are capped at 75% of the annual fixed base salary preventing management misconduct. We believe these profit-linked remuneration targets incentivize management to make strategic decisions supporting long-term profitability and sustainability. We consider the fact that Vestas publishes annual remuneration reports as positive.

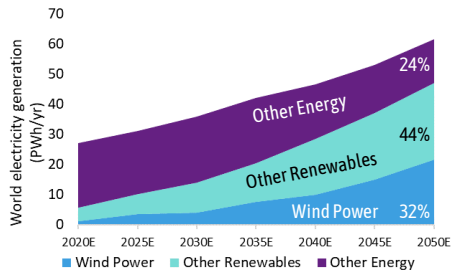
**Shareholders:** Vestas enjoys a diversified base of institutional shareholders. The company's free float accounts for 99.4% of outstanding shares and each share carries one voting right. The largest shareholders include institutional asset managers and pension funds with strong ESG mandates (Appendix 7). Vestas gains brand premium by having reputable institutional investors such as BlackRock as one of its largest shareholders. Furthermore, the company has less than 5% equity concentration by a single investor, which ensures diversity and reduces the possibility of price-attacks from sudden sell-offs.

To summarize, we consider Vestas ESG performance to be solid and we expect Vestas' strong ESG standing to continue attracting ESG conscious investors who recognize and appreciate that the company poses a small ESG risk within their portfolio.



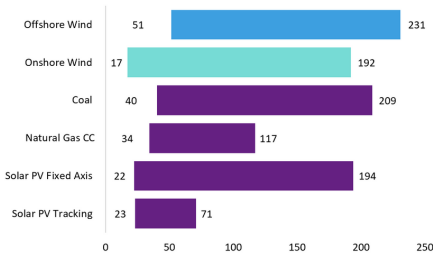
# INDUSTRY OVERVIEW AND COMPETITIVE POSITIONING

Figure 12: Wind and Renewable portion of electricity mix



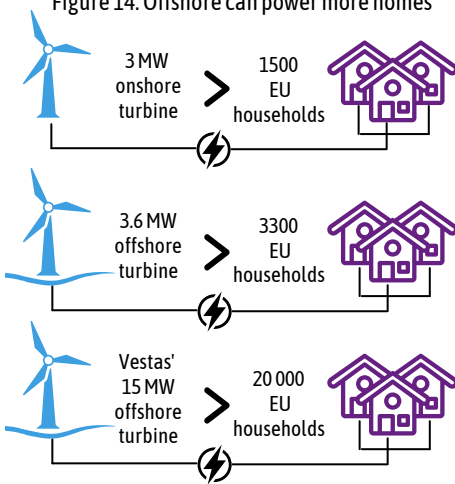
Source: BloombergNEF, Team Analysis

Figure 13: LCOE by electricity source



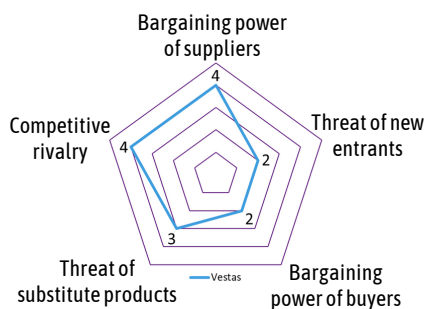
Source: Bloomberg NEF, Team Analysis

Figure 14: Offshore can power more homes



Source: EWEA, Company Data

Figure 15: Porter's five forces analysis



Source: Company Data, Team Analysis Detailed breakdown in Appendix D2

Following the industrial revolution, the past 100 years have seen an unparalleled growth in the energy industry, amassing a total market size of USD 400bn in 2020 for electricity in the US alone. Now, we are at the brink of a new revolution, as renewables penetrate the energy mix, replacing conventional energy sources such as oil, coal and natural gas. The world electricity generation is expected to increase two-fold, reaching 60 PWh by 2050 (Figure 12). Wind and solar are set to meet 56% of this electricity demand, with green hydrogen storage providing a solution to their fluctuating power supply (BNEF). With wind having the lowest carbon footprint compared to other electricity generating sources, we are confident that wind is poised to win this energy race.

## DEMAND DRIVERS

We expect strong industry growth propelled by three key demand drivers: 1) strong appetite for renewable energy, 2) lower costs establishing wind as a renewable leader, and 3) a pivot towards offshore's growth potential. We believe Vestas is uniquely positioned to take advantage of these favourable macro trends.

**Strong appetite for renewable energy:** The urgency of combating climate change is demanding immediate action to become carbon neutral, pushing both governments and corporations to invest heavily in the renewable transition. Governments are phasing out renewable subsidies in favour of direct investments. The USD 1.2tn EU green deal and Biden's USD 1.7tn pledge following his election, are just the tip of the iceberg, as BNEF projects USD 12tn in renewable investments over the next 30 years. Businesses are simultaneously pressured to meet strict decarbonization goals. This has caused corporate power purchasing agreements for renewable energy to triple over the past three years. We predict this trend to continue, removing significant roadblocks to financing for renewable companies.

**Lower costs establishing wind as a renewable leader:** As wind power shifts from a subsidy-based to an auction-based industry, providing the cheapest electricity (lowest LCOE) has become imperative for winning tenders. Due to improved technology, supply chain integration and economies of scale, onshore wind power is now the cheapest form of new electricity, with a global average levelized cost of 0.053 EUR/kWh (Figure 13). Solar trails behind onshore wind, with the second lowest LCOE. The emerging offshore wind sector is currently costlier, but we expect it to rapidly become cost-competitive with solar over the next decade. While solar excels on a small commercial scale, wind outshines on large utility scale projects, powering cities instead of individual houses. However, we believe wind and solar complement each other as windy and sunny weather conditions do not often come hand in hand. In combination, they can provide a steady supply of energy, regardless of the weather. A detailed analysis comparing wind and solar can be found in Appendix D1.

**A pivot towards offshore's growth potential:** As offshore wind provides larger capacity in terms of turbine size and wind speeds than onshore, many companies have pivoted to capture its potential (Figure 14). Wind turbines the size of skyscrapers enable developers to harvest more consistent high-speed winds blowing out at sea, without exhausting valuable land. Nonetheless, the harsh marine environment entails several challenges, requiring higher durability, energy transportation and installation costs. We believe the complexities of operating offshore will be compensated with soaring long-run returns for the most innovative players. With offshore having an expected CAGR of 11.5% until 2050, wind manufacturers are investing heavily in R&D, thereby rapidly reducing costs. Despite the technological immaturity, strong demand is already materializing, as visible by the EU's USD 1tn pledge in direct offshore investments.

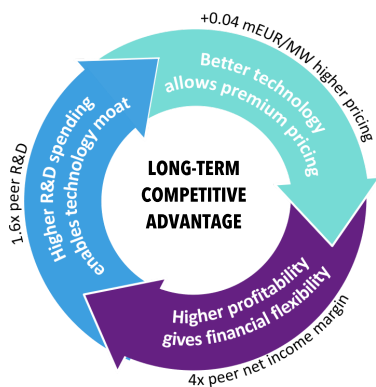
## SUPPLY DRIVERS

**Superior technology - primary focus:** To stay on par with declining costs of energy and remain relevant, companies are forced to innovate frequently, incrementally upgrading their products. This is creating a need for dynamic manufacturing capability such as modular platforms, which enable shorter product cycles of wind turbines. Service is also becoming increasingly reliant on technology and predictive data analytics to lower maintenance costs and increase turbine uptime. We expect this focus to constrain supply as merely the largest companies can afford the increasing overhead R&D to innovate.

**High barriers to entry and fierce competition further consolidate the market:** The large investment cost combined with the high specialization required for turbine manufacturing make it unfavourable to enter the OEM market (Figure 15). Oil giants looking to pivot into renewables have therefore entered the wind market as developers, oversaturating the buy side and bringing their financial strength as customers of wind OEMs. In combination with the fierce competitive rivalry, we believe the wind OEM market will continue to consolidate, with top players gaining market share.

To summarize our industry analysis, we expect the market balance to tighten in the next few years where the booming renewable demand will outpace supply. With few alternative suppliers, Vestas is uniquely positioned to benefit through its best in class technology, superior offshore product and ESG dominance.

Figure 16: Long-Term Competitive Advantage



Source: Team Analysis, Bloomberg

## COMPETITIVE POSITIONING

Vestas' competitive advantage is anchored in its strict pricing discipline (Figure 16). Price leadership gives Vestas the financial flexibility to invest heavily in R&D, compared to loss making peers (Appendix D3). As a result, Vestas has become synonymous with best-in-class technology, securing a global lead in both onshore and service. We believe this lead can be successfully translated into the offshore segment with the help of Vestas' fully integrated global service and supply chain (Appendix D4).

## LEADING THE PACK

Leveraging its superior technology, Vestas is set to grow its onshore market share excluding China from 35% in 2019 to 50% in 2026, cementing its leadership position. Its closest competitors are Goldwind, GE and SGRE. Although Goldwind is the closest competitor in terms of market share, its low upfront but high maintenance cost model is ill-suited for expansion outside of China, which we expect to persist in the future. We also expect the Chinese market to lean towards Vestas, favoring lower LCOE versus lower upfront costs over the next decade, a point not currently reflected in our base model. GE and SGRE have a global reach, but with lower onshore market share (approx. 20% each ex. China).

## PRICE LEADERSHIP STATUS FINANCES SUCCESS

Unlike SGRE, which pursued higher market share in emerging markets at the expense of a lower selling price of ~ EUR 0.72m/MW in last 2 years, Vestas has always maintained a strict pricing discipline of ~ EUR 0.76m/MW regardless of location (Figure 17). As the onshore market transitioned from subsidy based to auction based, peers lowered their prices to win tenders. On the contrary, Vestas funneled surplus into R&D to develop more efficient turbines for the same price, thereby increasing profitability. In our opinion, the resulting gap in technology will continue to widen as loss-making over-leveraged peers cannot afford to upgrade their inferior turbines (Appendix D3).

## VESTAS AS A TECHNOLOGY COMPANY

We believe the market has underappreciated Vestas' tech leadership, and fundamentally undervalued its technological moat. Compared to its closest peers, Vestas invests 60% more in key technologies through R&D, which will lower the LCOE of future systems, giving it a competitive edge in winning auctions. We have identified three key tech-enabled areas of Vestas' operations that sets them apart from peers (Figure 18):

**Investing in hybrid solutions to solve grid imbalance:** Looking beyond wind to draw on more stable power, Vestas has opened its eyes to combining the existing wind and solar sources with emerging energy-storage technologies. Collaborating with other tech-companies like Tesla, Vestas is exploring the untapped hydrogen and battery-storage market to power the green future.

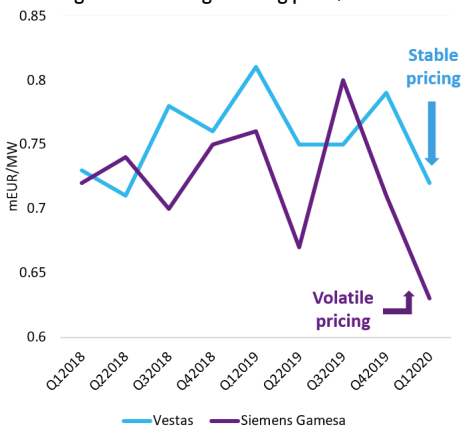
**Digitized supply chain enables modular flexibility:** Vestas has the highest level of vertical integration in the sector, enabling it to manufacture and develop superior components in-house. They are the only industry player to produce its own pitch control system, which allows Vestas to significantly reduce downtime compared to peers as pitch-control failure accounts for 25% of global turbine downtime. Resembling a tech-company, whose focus is simplicity, Vestas prioritizes standardizing components to reduce complexity and add flexibility across its value chain. This is best encapsulated by the EnVentus Platform, which offers more modularized and customizable products, with more than 60% identical components across all turbines. To create a globally connective tissue, Vestas aims to digitize its inventories and workflow. As a result, it is able to incorporate 3D additive manufacturing, enabling worldwide instant production of complex parts on-site.

**Predictive analytics and machine learning to reduce maintenance costs:** Vestas' strong focus on digitally enhancing its service segment through pioneering data analytics and big data has materialized in lower LCOE. By pointing out problems before they result in system stops and failures, Vestas provides high turbine uptime, establishing itself as a tech-premium brand. Vestas has leveraged this advantage to lock in customers through long term service contracts which average 19 years, ensuring that its high margins will persist in the future. A more detailed analysis of Vestas' technological leadership and its comparison with peers can be found in the Appendix D6.

## STRATEGIC STEPS TOWARDS OFFSHORE DOMINANCE

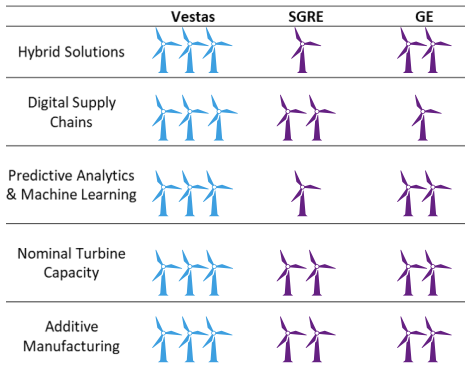
With the full acquisition of MVOW and the launch of the V236-15.0 MW turbine, we predict Vestas is strategically positioned to translate its onshore market leader position into offshore over the next few years. Unlike competitors, by using high-quality onshore components (i.e. gearbox) in its offshore production, Vestas now has more scalable turbine technology, best encapsulated by its V236-15.0 MW turbine. This design decision synergizes with its entire onshore value chain, stretching from production to services and allows the offshore segment to benefit from the accumulated onshore experience. The timing of the acquisition is not insignificant as the V236-15.0 MW is constructed specifically to enable economies of scale and benefit from the shared EnVentus modularization. Now offering the highest capacity turbine on the market, Vestas is poised to take a leadership position offshore by 2026. We believe SGRE and GE will not have time to close the capacity gap, allowing Vestas to seize the majority of the burst of new tenders following the Biden election and EU green deal.

Figure 17: Average selling price/MW



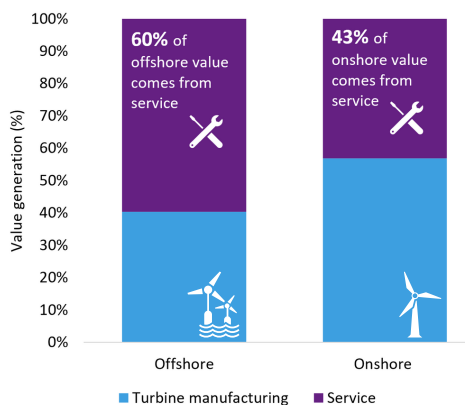
Source: Team Analysis, Bloomberg

Figure 18: Key differentiators among peers



Source: Team Analysis, Companies' Data

Figure 19: Higher value generation from offshore service



Source: Team Analysis, Company Data Detailed breakdown in Appendix D5

## OFFSHORE SUCCESS PROPELLED BY SUPERIOR SERVICE

Due to high wear and tear, we believe that servicing offshore turbines will be the key value driver for offshore manufacturers. We estimate that servicing offshore turbines will generate 60% of the lifetime operating profit per turbine for Vestas' offshore operations, a sharp increase from the 42% in onshore today (Figure 19). The offshore wind farms require highly specialized service operation vessels equipped with tools and parts, often on station for weeks, significantly increasing costs. Vestas has an unparalleled service segment and is currently the only wind OEM with a global service setup, allowing Vestas to profit substantially more compared to peers from the offshore transition.

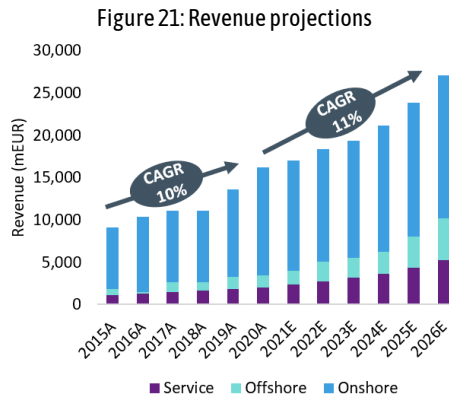
## FINANCIAL ANALYSIS

Figure 20: Key Financial Figures

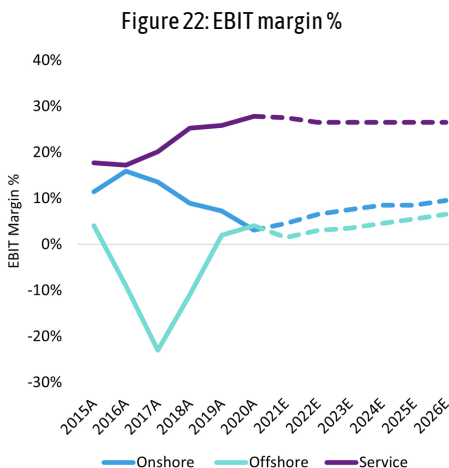
Vestas - Key Financials (mEUR)	2015A	2016A	2017A	2018A	2019A	2020E	2021E	2022E	2023E	2024E	2025E	2026E
Revenue	8,423	10,237	9,953	10,134	12,147	14,819	16,977	18,363	19,381	21,122	23,874	27,158
Market share	13%	18%	19%	24%	23%	25%	29%	30%	30%	28%	29%	30%
Market share (ex. China)	24%	26%	27%	40%	44%	45%	46%	47%	48%	48%	49%	49%
EPS	2.9	4.5	4.3	3.5	3.6	3.9	5.9	7.3	8.3	9.9	12.2	13.5
Dividend per share (EUR)	0.9	1.3	1.2	1.0	1.1	1.1	1.9	3.0	3.7	4.2	5.0	6.1
Payout ratio (%)	31%	29%	29%	28%	30%	30%	32%	40%	44%	42%	41%	45%
<b>PROFITABILITY RATIOS</b>												
Gross margin (%)	17.9%	20.8%	19.7%	16.1%	14.5%	10.4%	12.6%	13.6%	14.6%	15.6%	16.6%	16.6%
EBITDA margin (%)	14.9%	17.8%	16.6%	13.8%	12.8%	9.4%	11.1%	12.6%	13.6%	14.6%	15.7%	15.8%
EBIT margin (%)	10.8%	13.9%	12.4%	9.1%	8.3%	4.7%	7.4%	8.5%	9.0%	9.8%	10.8%	10.7%
NI margin (%)	8.1%	9.4%	9.0%	6.7%	5.8%	5.2%	7.0%	8.1%	8.7%	9.5%	10.3%	10.0%
ROE (%)	26.0%	31.7%	28.4%	22.0%	22.1%	21.4%	21.7%	23.2%	22.9%	23.6%	24.7%	23.7%
ROIC (%)	26.2%	32.6%	28.1%	22.6%	22.1%	13.7%	18.8%	19.9%	19.5%	20.0%	21.0%	20.0%
<b>LEVERAGE AND LIQUIDITY RATIOS</b>												
Total Debt/EBITDA (x)	0.4	0.3	0.3	0.4	0.5	1.0	0.8	0.8	0.8	0.8	0.7	0.7
D/E (%)	17.1%	15.5%	16.0%	16.0%	24.5%	28.8%	27.9%	27.4%	27.5%	27.3%	27.0%	27.4%
Current ratio	1.24	1.24	1.23	1.16	1.12	1.09	1.07	1.09	1.10	1.13	1.17	1.19
<b>OPERATIONAL FIGURES</b>												
Order intake (MW)	8,943	10,494	11,176	14,214	17,877	17,249	18,974	20,871	22,958	25,254	27,780	30,558
Order backlog - wind turbines (MW)	8,732	9,530	11,492	15,646	20,974	24,630	24,690	25,652	27,841	30,616	33,575	36,577
Deliveries (MW)	7,486	9,654	8,779	10,847	12,884	17,212	18,914	19,910	20,769	22,479	24,821	27,556
EBITDA per MW	17%	19%	19%	13%	12%	8%	10%	12%	13%	14%	15%	16%
Net Working Capital	-1,383	-1,941	-1,984	-2,040	-1,583	-1,127	-1,163	-1,039	-864	-784	-508	-397
Capex	425	817	407	1,090	491	267	1,000	834	989	858	1,088	1,314

Source: Team Analysis, Bloomberg, Company Data

## SCALING THE REVENUE ENGINE WITH THE OFFSHORE EXPANSION



Source: Company Data, Team Analysis



Source: Company Data, Team Analysis

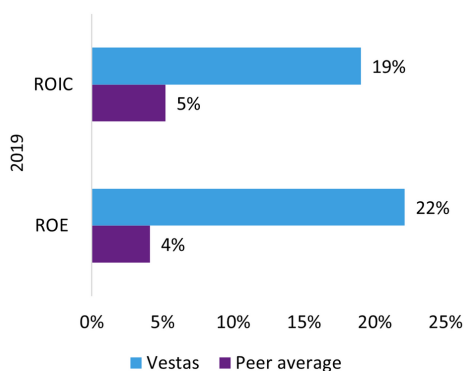
Forecasting revenues over a 6-year period, we estimate a CAGR of 11% (Figure 21). Vestas' revenue is driven by its three segments - onshore, offshore and service, which we project both separately and regionally (Americas, EMEA, China and APAC exl. China). Onshore and offshore revenues are determined by selling prices and MW delivered, mapped out from Vestas' existing project pipeline supplemented with our market expectations. We use the previously estimated deliveries as a proxy for the growth in MW under service for Vestas' turbines to forecast service revenue (Appendix E1). Since 2015, Vestas has been able to grow at a 10% CAGR on the back of the strong onshore segment. The growth is expected to somewhat slow down in the upcoming three years as subsidies are phased out. We anticipate a new phase of booming onshore growth from 2024 onwards, in tandem with the increased policies, electrification and corporate green ambitions. Vestas will continue to gain market share onshore through superior technology and an enduring order backlog, capturing more than 30% of the market by 2026, 5% higher than today (Figure 20). Going forward, we believe offshore will become the new revenue driver, expanding rapidly post-acquisition as the V236-15.0 MW turbine launch paves the way for new projects. The new turbine is set to dominate the market from 2024, seizing an estimated 38% of the offshore market exl. China by 2026. Growing at a CAGR of 24%, offshore will bring the total revenue to EUR 27bn in 2026 (~EUR 5bn offshore alone). While we expect Vestas to maintain a strict price discipline onshore at EUR 0.73/MW, the offshore selling prices are expected to steadily decline from 1.45 EUR/MW in 2020 to 1.14 EUR/MW in 2026. The price decline is largely because subsidies being phased out will force offshore to compete with alternatives on price, requiring a reduction in price to achieve a competitive LCOE. With the addition of the booming offshore segment and 19 year long contract duration, MW under service is estimated to increase from 117 GW in 2020 to 268 GW in 2026, thereby increasing service revenue by 2.6 times.

## COST CONTROL AND TECHNOLOGY ALLOW MARGIN EXPANSION

Vestas has been able to maintain a solid margin lead despite the thinning margin environment caused by increased competition. The company's net income margin of 5.8% in 2019 was almost four times higher than the peer average. Despite suffering margins due to the pandemic, we expect Vestas to almost double its margins over the next 6 years. The 5% increase in COGS during 2020 has been the major pain point. However, we believe Vestas will stabilize to pre-Covid-19 levels by 2022, and reduce COGS from 90% of sales in 2020 to 83% in 2026. This will primarily stem from supply chain automation, production synergies following the MVOW acquisition, as well as declining costs of raw materials.

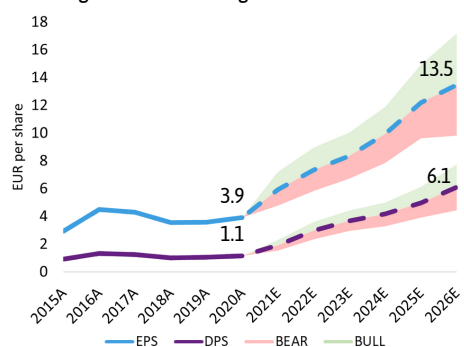


Figure 23: Superior profitability to peers



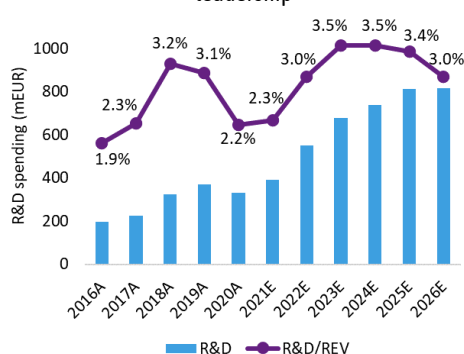
Source: Bloomberg, Team Analysis

Figure 24: Increasing returns to investors



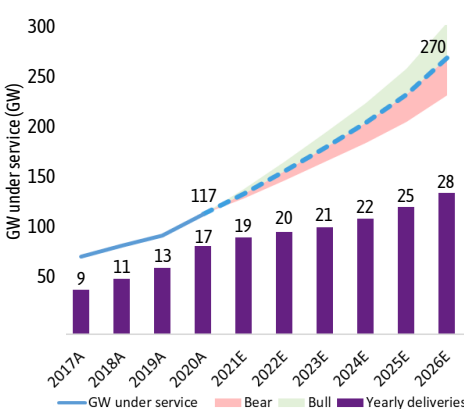
Source: Company Data, Team Analysis

Figure 25: High R&D spending cements leadership



Source: Company Data, Team Analysis

Figure 26: GW under service and yearly deliveries set to rocket



Source: Company Data, Team Analysis

In our opinion, steel, accounting for 80% of turbine’s mass, will drop in price following a declining demand from China (~50% of global steel demand) post 2020, significantly reducing input prices for Vestas. On the contrary, operating expenses are expected to jump by EUR 100m in 2021 due to one-time integration costs subsequent to the acquisition, then increase at around 4% each year. The rising OPEX will be mitigated through the ongoing margin improvement program. Coupled with lower onshore growth the next few years, it will enable Vestas to steadily improve efficiency and increase onshore EBIT margin, reaching 10% in 2026. In the offshore segment, EBIT margins will improve from an adjusted 4% in 2020 to 7% in 2026 as economies of scale and modularization synergies with onshore materialize. In the long run, we believe offshore margins will surpass onshore as technology advancements leave room for cost-competitiveness. We also expect digital enhancements to enable Vestas to maintain its service margin around 27% throughout the forecast period (Figure 22).

### INDULGING SHAREHOLDERS WITH HIGH EARNINGS AND DIVIDENDS

Historically, Vestas has been able to obtain superior profitability compared to competitors, which is a testament to its strict pricing, efficient investment allocation and superior technology. In 2019, Vestas outshined its peers with a ROIC of 19% vs. 5%, and a ROE of 22% vs. 4% (Figure 23). Similarly to margins, we expect the ROIC and ROE to recover post-pandemic, steadily increasing to 20% and 23.7% in 2026, respectively. This will result in favorable shareholder returns with Vestas delivering a CAGR of 23% in EPS between 2020 and 2026, reaching EUR 13.5 at the end of our forecast. We therefore expect Vestas to pass the excess earnings forward to shareholders in the form of dividends (Figure 24). The payout ratio is expected to gradually increase to 45% in 2026.

### UNMATCHED R&D CEMENTS TECHNOLOGY LEADERSHIP

The historically strong margins and high profitability have enabled Vestas to sustain significantly higher R&D spending than peers, thus, allowing it to keep its technological edge. Although we expect Vestas to increase R&D spending over the next 6 years, we believe it will not significantly ramp up spending before 2023 (Figure 25). This is primarily due to the recent launch of both the EnVenus onshore and 15MW offshore turbine. The R&D funds until 2022 are expected to be directed at launching a new service business unit, tapping into new revenue streams. From 2023 onwards, we expect to have an R&D spending of more than 3% of revenue, reaching EUR 815m in 2026, as both onshore and offshore segments enter a new growth phase.

### RISING CAPEX TO CAPTURE OFFSHORE WINDS

We expect CapEx to increase as the company expands its offshore domain, initially rising to EUR 1bn in 2021. CapEx will remain high until 2026, returning to above EUR 1bn in 2025 as both onshore and offshore enter a strong growth phase. The offshore expansion will require higher working capital, with estimated investments of approximately EUR 500m in 2021, followed by smaller investments YoY until 2026. Vestas will continue to enjoy a negative working capital, effectively borrowing from suppliers while receiving upfront payments from customers. Overall, we expect strong cash flow growth by the end of the forecast period after initial weaker cash generation in 2021 due to Covid-19.

### HEALTHY LEVERAGE AND LIQUIDITY LEAVES ROOM FOR OFFSHORE EXPANSION

With its healthy balance sheet, we believe Vestas is well-equipped to pursue the offshore adventure. In 2019, its book D/E ratio was 24.5% vs. a peer average of 51.6%, indicating an underleveraged capital structure that can readily support offshore expansion (Appendix D3). Although we do not model Vestas taking on much additional debt, they have large debt capacity should its strong cash reserves and customer prepayments become insufficient for funding future opportunities. While the peer average Debt/EBITDA multiple equaled an alarming 4x in 2019, Vestas could repay its debt in half a year, further indicating flexibility in terms of future capital raising. Vestas’ superior current ratio of 1.12 to the peer average of 1.09 in 2019, additionally ensures minimal financing risk. We expect the company operations to continue the same trend in the upcoming 6 years, reaching a current ratio of 1.19 in 2026.

### OPTIMISTIC OUTLOOK TOWARDS 2026

With a strong foothold in the onshore market characterized by enduring order demand, and a turbine capable of conquering the offshore market, we believe Vestas can reap the benefits from both segments. Its underleveraged capital structure coupled with the strong financial liquidity allows it to capture the upside potential from the offshore expansion. We believe that the offshore acquisition and Vestas’ tech-propelled service pose further unrealized synergies, which are expected to kick in from 2024 onwards. This will be reflected in its deliveries increasing from 17 GW in 2020 to 28 GW in 2026, which will result in GW under service skyrocketing from 117 GW to 270 GW (Figure 26).



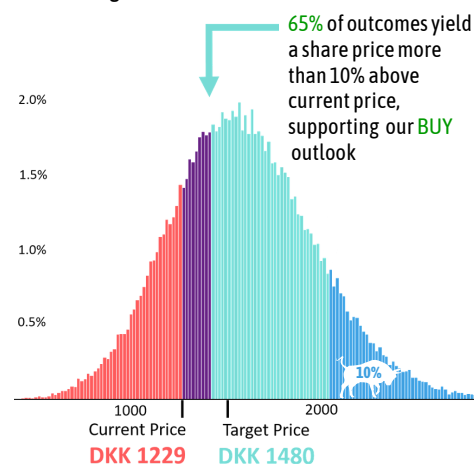
# VALUATION

Figure 27: WACC inputs

Input	Rate	Source
Risk free rate	1.87%	Weighted average based on revenue per region
Beta	1.14	Re-levered and risk-adjusted
Equity risk premium	4.72%	Denmark (Damodaran)
Cost of equity	7.06%	CAPM
Cost of debt	4.27%	Corporate bond spread + risk free rate
Tax rate	22%	Statutory tax (Denmark)
Market D/E ratio	10%	Target level
<b>WACC</b>	<b>6.72%</b>	

Source: Team Analysis

Figure 28: Monte Carlo simulation



Source: Team Analysis, Company Data

We reiterate our BUY recommendation for Vestas with a 12-month target price of DKK 1480, presenting a 21% upside potential on the closing price of DKK 1229 on February 10th 2021. In order to incorporate premiums gained from best-in-class technology, synergies from the offshore expansion and Vestas' unique position to capitalize on the renewable transition, we conducted a DCF analysis. To confirm the robustness of our DCF and to incorporate the investment risks outlined in the next section, we performed a sensitivity analysis, Monte Carlo simulation and a scenario analysis. Our analysis is complemented with a relative valuation, which verifies our buy recommendation.

## DCF VALUATION

Our DCF valuation employs the Free Cash Flow to the Firm (FCFF) methodology to arrive at the intrinsic value of the company (Appendix F2). This model befits Vestas' innovative company profile, allowing us to account for the high future growth prospects that the company faces regardless of its capital structure. We analyze Vestas and MHI's historical figures separately and value them as a consolidated company from 2021 onwards, with an explicit forecast period from 2021-2026.

## WACC

We estimate a WACC of 6.72% for Vestas (Figure 27). By adding Vestas' debt rating implied corporate spread to the risk free rate, we arrive at the cost of debt. We account for increased target leverage ratio by small adjustment to the corporate debt spread. To reflect Vestas' global operations, we revenue-weight the 10-year government bonds from countries contributing more than 1% to total revenue, arriving at a risk free rate of 1.87%. The cost of equity is calculated with the CAPM formula, reflecting Denmark's equity risk premium, the risk free rate and a re-levered beta from industry peers, of 1.1 (Appendix F2). We use a target market D/E ratio of 10% indicating our long term expectations for Vestas' debt level.

## TERMINAL GROWTH

We expect the terminal growth rate to stabilize at 2.5% after 2025 based on (1) projected real GDP growth in core markets, (2) a strong global focus on transitioning to renewable energy, and (3) long term inflation goals of Vestas' main countries of operation (Appendix). We see potential upside for the terminal growth rate based on the anticipated renewable energy dominance over the next decades and Vestas' favorable market position in particular. This will result in further appreciation of the share price far beyond our target price. Our terminal value of EUR 54bn implies an exit EV/EBITDA multiple of 12.4x.

## SCENARIO ANALYSIS

We perform a Monte Carlo simulation with 100k iterations by flexing key variables in order to gain a more holistic view on Vestas's share price trajectory under uncertainty (Figure 28; Appendix F4). By varying the terminal growth rate, WACC, COGS, onshore and offshore average selling price, as well as regional deliveries (Americas, EMEA, China and APAC exl. China), we arrive at a 65% probability of reaching prices with a minimum of 10% upside. Additionally, we perform a bull and bear case analysis to reflect the materialization of our three investment theses. A detailed breakdown of our assumptions and the target prices corresponding to each case can be found in Figure 29. Our Monte Carlo indicates a 10% probability of a share price equal to or above the bull case, and 6% for the bear case.

Figure 29: Scenario Analysis

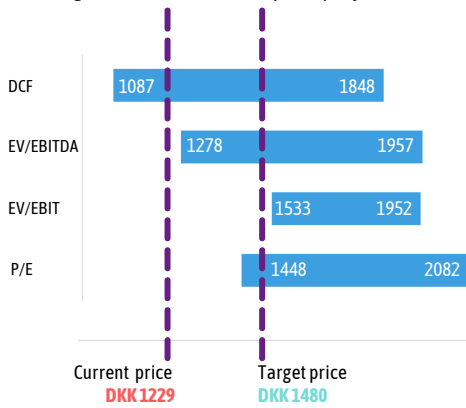
Scenarios	Bear case	Base	Bull case
<b>Technology moat unlocks higher pricing potential</b>	Vestas fails to maintain its technological leadership	Vestas successfully maintains its technological edge	Vestas widens its technological gap with peers
<b>Overall market share</b>	<b>20%</b>	<b>31%</b>	<b>40%</b>
<b>Offshore value maximized shareholder returns</b>	Failure to materialize synergies with MVOW	Partial materialization of synergies with MVOW	Full translation of the onshore success into offshore
<b>Offshore market share</b>	<b>20%</b>	<b>27%</b>	<b>40%</b>
<b>Uniquely positioned to capitalize on renewable transition</b>	Wind is unable to compete on cost globally with renewable alternatives	Wind and solar have comparable LCOEs and complement each other	Wind becomes the preferred new source of energy
<b>GW Delivered 2020-2025</b>	<b>115 GW</b>	<b>151 GW</b>	<b>195 GW</b>
<b>Price in DKK</b>	<b>1087</b>	<b>1480</b>	<b>1848</b>
<b>% change from current price</b>	<b>-12%</b>	<b>21%</b>	<b>50%</b>

Source: Team Analysis, Company Data

## SENSITIVITY ANALYSIS

We analyze our DCF model's robustness to changes in the key inputs, namely WACC, terminal growth, average selling price, MW delivered and COGS, to determine their effect on our buy recommendation (Appendix F3). We find that a sharp decline of 15% in both the average selling price and the MW delivered could influence our recommendation. However, we deem such a sharp decline in either of these inputs highly unlikely given the strict pricing discipline and strong order backlog already in place. On the other hand, a 2% increase in the COGS/revenue ratio over the forecasted period will not have an impact on our valuation. Furthermore, given the global momentum of the renewable transition and the capital committed, we believe terminal growth is more likely to pose an upside potential than downside threat.

Figure 30: Football field price projection



Source: Bloomberg, Team Analysis

## RELATIVE VALUATION: AN UNDERVALUED COMPANY IN AN ATTRACTIVE INDUSTRY

To confirm our recommendation, we conduct multiples valuation, where we compare Vestas to similar listed companies in terms of business characteristics and risk exposure (Figure 30). We construct four peer groups based on industry affiliation, where we include peers from the wind-, solar OEM- and green technology industry, following our belief that Vestas shares similar industrial characteristics. We split the wind sector in non-Chinese and Chinese peers arguing that Vestas relates closer to the higher priced non-Chinese peers. We expect a potential repricing of Vestas as we believe Vestas should trade closer to multiples of broader green technology companies due to its superior technological leadership and innovation. Consequently, we apply a small premium to the EV/EBITDA multiple compared to Vestas' wind peers. We obtain an implied target price of DKK 1507, which represents a 23% upside and supports our buy recommendation. We identify EV/EBITDA as the most appropriate multiple due to the capital intensive nature of the industry. However, we also study other relevant multiples, including EV/EBIT and P/E, and reach the same conclusion (Figure 31, Appendix F5).

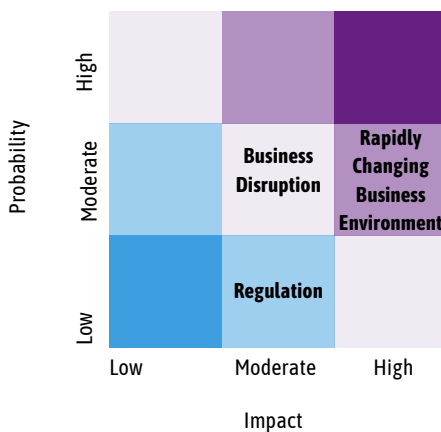
Figure 31: Relative valuation

Peer group	# of peers	2021 EV/EBITDA		2021 EV/EBIT		2021 P/E		2021 EV/Sales	
		Average	Median	Average	Median	Average	Median	Average	Median
Non-Chinese Wind	4	22,4	22,4	39,4	39,4	53,6	49,0	0,5	0,5
Chinese Wind	3	12,8	11,4	14,7	15,2	15,9	15,5	1,1	0,5
Solarpower manufacturer	4	13,5	13,0	23,3	23,6	31,5	27,8	1,0	0,8
Green technology	4	45,9	37,6	66,5	46,2	82,0	53,4	3,9	0,4
<b>Vestas 2021 multiple</b>		<b>24</b>		<b>37</b>		<b>34</b>			
<b>Implied target price</b>		<b>1507</b>		<b>1551</b>		<b>1510</b>			

Source: Team Analysis, Bloomberg

## INVESTMENT RISKS

Figure 32: Risk matrix



Source: Team Analysis, Company Data

We identify the top three investment risks for Vestas to be business disruptions, regulations, and a rapidly changing business environment (Figure 32). The highly competitive international environment exposes Vestas to additional risks, as outlined in Figure 33. Although we acknowledge that these threats may potentially harm profitability and reduce investment return, we do not find any high probability-high impact risks (Figure 34).

## OPERATIONAL RISKS: BUSINESS DISRUPTION

**Probability:** Moderate - **Impact:** Moderate

**B1. Post-acquisition integration risk:** We believe investors may face the risk that Vestas fails to translate its onshore success into offshore. The complex installation and different environmental conditions accompanied by offshore could lead to a failure to capture synergies post-acquisition.

**Valuation Impact:** This is reflected in our bear scenario, where Vestas only captures 20% offshore market share by 2026, resulting in a price of DKK 1087 (-27% downside from target price).

**Mitigation:** With a 50% stake, Vestas had good insight into MVOW pre-acquisition, enabling accurate assessment of synergies, thus limiting the potential downside. By applying the modularized onshore components in its offshore production, Vestas has a unified technology it can further expand upon. We also expect that the integration risk will be outweighed by the mitigation of other more severe risks through the acquisition. Our Monte Carlo reveals that there is only a 6% chance of the bear case materializing, deeming the post-acquisition risk improbable.

**B2. Risk of natural disasters and pandemics:** Vestas is susceptible to direct supply chain costs as well as indirect project delay or cancellation costs in the event of natural disasters or a pandemic.

**Valuation Impact:** Our sensitivity analysis shows that a drop in deliveries of 15% is required to downgrade our recommendation to a DKK 1225 share price (-17% downside from target price).

**Mitigation:** The geographical diversification of Vestas' facilities coupled with its high degree of vertical integration reduces the risk of a full stop in production. Vestas further mitigates this risk by leveraging grid modernizations and weather protection systems. Listed as an essential service, Vestas handled Covid-19 gracefully with a record 17.2 GW deliveries, which we believe is indicative of future resilience.

Figure 33: Summary of key risks and mitigation measures in place

Risks	Mitigation
<b>Business and operational risks</b>	
B1. Post-acquisition integration risk	Good insight into MVOW pre-acquisition. Unified technology for further expansion
B2. Natural disasters and pandemics	Resilient supply chains Geographically diverse locations Weather protection systems
B3. Execution risk	Well-designed contracts Healthy liquidity ratio
B4. Technology risk	Strategic R&D investments Top of the line service segment
<b>Political risks</b>	
P1. Regulatory risks	Diverse revenue stream
P2. Risk of trade barriers	Technological leadership Global supply-chain
<b>Market risks</b>	
M1. Innovation risk	EnVentus platform Hybrid solutions
M2. Threat of new entrants	Increased service contract duration Technological leadership which is hard to replicate

Source: Team Analysis

Figure 34: Risk heat map



Source: Team Analysis

**B3. Execution risk resulting from large order volumes:** High order volumes expose the company to the risk of budget overruns and warranties should they fail to deliver quality products on time.

**Valuation impact:** We have sensitized COGS/revenue, and found that Vestas can sustain a 2% increase in this ratio over the entire forecasted period.

**Mitigation:** Vestas' all-time high quarterly deliveries are a testament to its growth capabilities. We believe the well-designed contracts allowing flexible deliveries and the vertical integration will also signal Vestas' future ability to deliver record volumes, on time. Solid financial strength serves as a cushion in case of extraordinary warranty provisions.

**B4. Technology risk:** The competitive rivalry over the past years has driven OEMs towards fast-paced development of new technologies. Companies are forced to roll out new products at an earlier stage in the design phase and lower LCOE, increasing the technical risk.

**Valuation impact:** A 2% increase in COGS over the forecasted period results in a share price of DKK 1246 (-16% downside from target price).

**Mitigation:** Vestas continues to make better investments than competitors in error reducing technologies like predictive analytics and very low defect manufacturing to offer tighter service and manufacturing warranty provisions.

### POLITICAL RISKS: REGULATION

**Probability:** Low - **Impact:** Moderate

**P1. Regulatory risk:** As governments phase out subsidies, Vestas has to adapt to an auction based market, competing on LCOE to win tenders. Protests against onshore wind's noise pollution could influence political will and lead to removal of green stimulus packages, falling short of investors' high expectations.

**Valuation Impact:** This is addressed in our Monte Carlo through varying regional deliveries based on expected governmental support, with only 17% of the scenarios leading to a sell recommendation.

**Mitigation:** Management's ambition to retain their technological leadership position makes Vestas less dependent on government subsidies, as its products will remain profitable on their own. In addition, Vestas' diverse revenue stream lowers risks of individual political changes. As a response to noise complaints, Vestas has a best-in-class sound power optimization system, including computational fluid dynamics modelling.

**P2. Risk of trade barriers:** Vestas' global operations are subject to significant risks related to trade wars and tariffs, such as increased costs of raw materials and transportation.

**Valuation Impact:** Similarly to the regulatory impact we have sensitized this in the Monte Carlo, which deems this risk unlikely.

**Mitigation:** Having a global supply-chain enables Vestas to obtain similar turbine components from multiple suppliers. As no one supplier represents more than 5% COGS, the temporary distress of one procurement source will not cause large shocks to their value chain. Producing the turbines itself locally further lowers the risk from protectionist policies.

### MARKET RISKS: RAPIDLY CHANGING BUSINESS ENVIRONMENT

**Probability:** Moderate - **Impact:** High

**M1. Innovation risk:** If management is unable to continuously achieve lower LCOE and dominate the market, both within wind and broader renewables, investors are exposed to downside.

**Valuation impact:** Our bear scenario demonstrates the impact of failure to innovate, with overall market share falling to 20% in 2026, reaching a price of DKK 1087 (-27% downside from target price).

**Mitigation:** Leading R&D spending combined with the EnVentus platform's modularity allow Vestas to incrementally upgrade specific turbine components, not requiring a full product launch. This allows it to consistently remain at the forefront of technology. Vestas is also improving its hybrid capabilities, looking into adjacent technologies to combine wind, solar and hydrogen, ensuring grid effectiveness and a more consistent base power. By avoiding a myopic business strategy, we believe Vestas secures its key role in the renewable transition.

**M2. Threat of new entrants:** The attractive margins of the service segment could potentially lure new independent competitors, as the high barriers to enter the OEM sector do not fully apply to the service sector.

**Valuation Impact:** We proxy new competitive entrants through a loss of MW under service. Sensitized via our Monte Carlo simulation this yields a share price of DKK 1207 (-18% downside from target price) in the 15th percentile.

**Mitigation:** Over the past years, Vestas has steadily increased their service contract duration, with new contracts currently averaging 19 years. In addition, its industry leading data capabilities and sustained technological leadership are hard to replicate.



# List of Appendices

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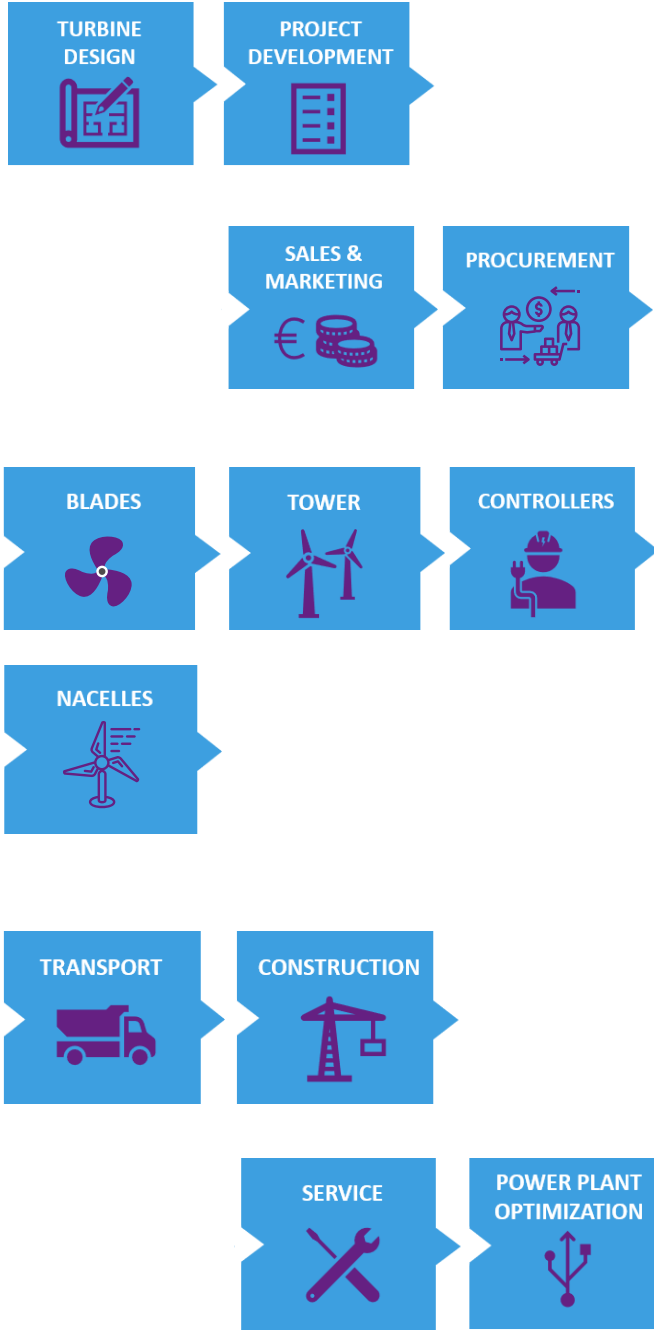
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## Appendix A - Glossary

APAC	Asia-Pacific region - South, East, Southeast Asia, as well as Oceania
Auction-based industry	The party presenting the most appealing offer receives the contract
BNEF	Bloomberg New Energy Finance (BNEF)
Bull and bear analysis	The bull and the bear symbolize optimism and pessimism, respectively, about the outlook of a stock
Downtime	A period when a system is unavailable for use
EMEA	Europe, Middle East, and Africa
Gearbox (Wind Turbine)	The gearbox in a wind turbine is used to increase the rotational speed and is connected with an electrical generator
Green technology industry	Companies that use advanced systems and services to a variety of industries with the aim to improve sustainability and efficiency
GW	Gigawatt (GW) is a unit of power. One gigawatt is equal to 1 000 megawatts
KW	Kilowatt (kW) is a unit of power. One kilowatt is equal to 1 000 watts
LCOE	The minimum constant price at which electricity must be sold for the project to break even throughout its lifetime.
MW	Megawatt (MW) is a unit of power. One Megawatt is equal to 1 000 kW
Pitch control	The technology used to control and operate the angle of the blades in a wind turbine, usually it is made of electronic motors or hydraulic cylinders and a power supply system
Power Purchase Agreements	A Power Purchase Agreement (PPA) is a contract between an energy seller and a buyer
Power-to-X	Power-to-x is a number of electricity conversion, energy storage, and reconversion pathways that uses surplus electric power
PWh	Petawatt hour (PWh) is a unit representation in electricity power engineering and is equal to 3,600 kilojoules
Relative valuation	Relative valuation is based on the idea that similar assets should sell at similar prices. Meaning that one uses similar, comparable assets in valuing other assets.
Subsidy-based industry	Industry dependent on government incentives
Tender offer	A public takeover bid representing an offer to purchase some or all of the shareholder's shares in a firm

# Appendix B1 - Vertically integrated supply chain

Vestas has a fully integrated supply chain, meaning it controls the entire process and can optimize efficiency. Throughout its supply chain, the company utilizes Lean 6 Sigma principles ensuring low defect, readily available products. The different elements of the supply chain are described in detail below.



## Turbine Design and Project Development

Vestas has over 40 years of experience in designing wind turbines. It is constantly aiming to maximize the potential of each wind site. In order to ensure value chain optimization, Vestas designs its turbines based on modularity. Vestas' project development unit is responsible for the strategic development of new wind projects and assists in coordinating items such as project financing, optimal site placement, and project planning.

## Sales & Marketing and Procurement

Vestas' sales and marketing team is responsible for the budget estimate process, capacity planning process and the product mix optimization. Vestas' procurement team is responsible for obtaining supplies and services which do not originate within the company. Specifically, the company bolsters production capabilities by establishing supply contracts which are flexible, asset-light and low cost.

## Blades, Tower, Controllers and Nacelles

The blades are the largest component of the wind turbine and the most expensive and vulnerable component, due to exposure to heavy loads and weather conditions. Vestas produces and conducts quality assurance on blades used in their turbines. The tower in the structure supporting the blades and nacelles. Vestas produces its own towers with the majority coming from their Colorado facility, the largest in the world, producing nearly 1300 towers / year. Vestas has chosen to primarily produce its own towers because of global capacity constraints and a lack of qualified sub-suppliers. The controller in Vestas wind turbines can be divided into two major components; the yaw controller and the production controller which is used to regulate the power produced by the turbine. Vestas Colorado based nacelles factor has a manufacturing capacity of 1,400 nacelles per year. This location was selected for its skilled workforce, high education level, logistics system (including rail), and government support.

## Transport and Construction

In order to secure safe and seamless transportation, Vestas has formed a transport and logistics team due to the complexity of transporting. Vestas traditionally serves as the single point of contact during the Engineering, Procurement and Construction (EPC) product development segment. The integrated supply chain includes comprehensive planning, civil works, supply & installation, and electrical works.

## Service and Power Plant Optimization

Vestas' best in class service segment offers a range of service packages to their customers, prolonging the life time of each turbine and optimizing power output. Vestas takes a holistic view of turbine fleets and offers power plant upgrades through turbine component upgrades and site specific operational optimization. The company's PowerPlus fleet optimization services claims to improve electrical output from legacy windfarms by up to 5%.

Source: Company Data, Team Analysis

	Wind Project Planning	Procurement	Construction	Operation and Service	Power Plant Optimisation
<b>Vestas</b>	Strong Presence	Strong Presence	Strong Presence	Strong Presence	Strong Presence
<b>SIEMENS Gamesa</b> RENEWABLE ENERGY	Minor Presence	Strong Presence	Strong Presence	Strong Presence	Strong Presence
<b>General Electric</b>	Minor Presence	Strong Presence	Strong Presence	Strong Presence	Strong Presence
<b>GOLDWIND</b>	Minor Presence	Strong Presence	Strong Presence	Strong Presence	Minor Presence
<b>MINCYANG WIND POWER</b> 明阳风电	Minor Presence	Strong Presence	Strong Presence	Strong Presence	Strong Presence
<b>NORDEX</b>	Minor Presence	Strong Presence	Strong Presence	Strong Presence	Strong Presence

Source: Company Data

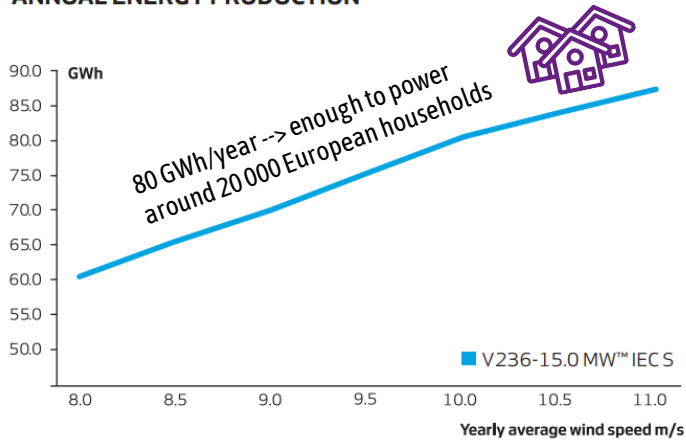
Strong Presence  
Minor Presence



## Appendix B2 - Newly launched offshore wind turbine

Vestas' V236-15 MW turbine was designed with a singular objective in mind: creating a raw, technologically superior turbine able to generate enough demand to rocket Vestas to a market leader position in offshore by 2026. With a new growth spurt on the horizon, offshore wind will no longer be in its infancy stage. We believe offshore will quickly shift from European small-scale projects to massive country-powering projects all across the globe. Anticipating this, the V236-15MW turbine is built to utilize the global economies of scale Vestas enjoys as the largest player in the industry. It utilizes the modular parts EnVentus provides for both onshore and offshore construction, significantly reducing costs of production and transport for both segments.

### ANNUAL ENERGY PRODUCTION



Source: V236-15.0 MW brochure, Team Analysis

### V236-15 MW Offshore Turbine

Nominal Power	15,000 kW
Rotor Diameter	236 m
Swept Area	43 742 m <sup>2</sup>
Capacity Factor	60%
Design Lifetime	25 years
Cut-in wind speed	3 m/s
Cut-out wind speed	30 m/s
Temperature range	from -15°C to +25°C

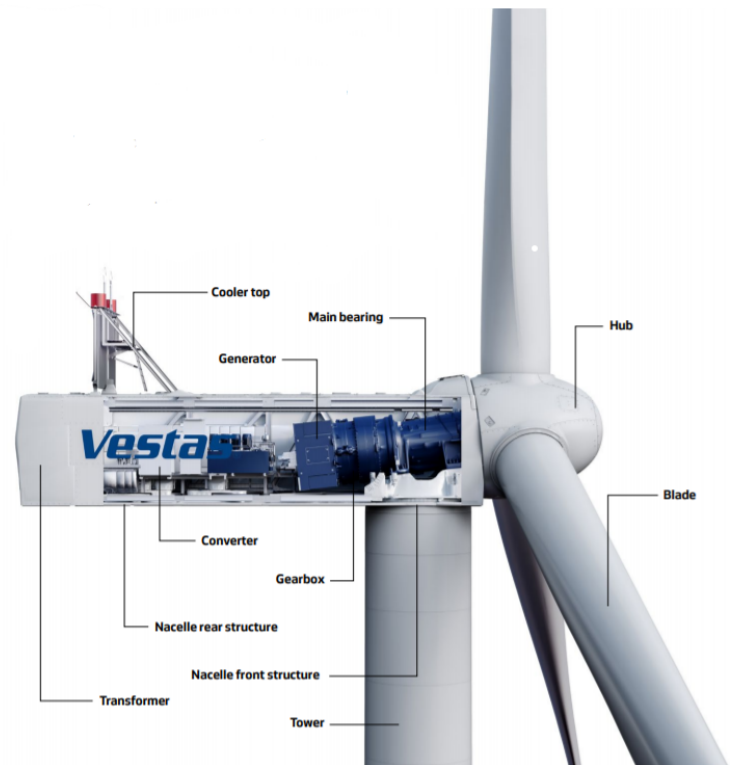
Source: V236-15.0 MW brochure, Team Analysis

The turbine's high adaptability allows it to be utilized for both bottom-fixed and floating offshore wind. This is particularly important as the superior capacity of 60% will allow floating offshore turbines to really harness the full potential of consistent highspeed winds offered far from shore. It is also specifically designed for easy service access when floating, a major pain point for competing turbines.

Determined to lead the energy transition, the V236-15 MW turbine is not only the most powerful wind turbine in the world, but at the forefront of building a sustainable future. A single turbine saves up to 38,000 tones of CO<sub>2</sub>, which is the equivalent of removing more than 25,000 cars from the road every year. With a 25 year lifespan this will have a lasting impact on the environment.

## Appendix B3 - EnVentus platform

- The EnVentus platform, introduced in 2019, is one of Vestas' technological breakthroughs. The platform is a fruit of meticulous analysis conducted on the Vestas' existing technology solutions. It is a versatile platform that delivers a high level of robustness and performance coupled with an ability to facilitate an even more finely matched combination of turbines to harness more of the available wind power.
- EnVentus's variants enable connection of the existing designs from the 2, 4 and 9 MW platforms and feature a nominal rating of 6.0 MW. They are aimed at low to medium wind speed locations, with a recently emerging application in high wind speeds as well.
- Vestas' EnVentus wind turbine platform is fully modularized meaning that all major components can be swapped with existing, off-the-shelf systems depending on the customer's specific needs. It allows for synergies across different platforms and variants and utilizes multiple reusable modules depending on the market and the project conditions.
- EnVentus benefits from a full-scale converter, which enables siting at increasingly complex project conditions. The scale converter is accompanied with a magnet generator, whose objective is to provide maximum system efficiency. Specialized packages can be added to the standard EnVentus model including noise and vibration dampening in order to speed up the permitting process.
- EnVentus systems are grid compliant in multiple configurations around the world, which is a testament to the Vestas' devotion to its ultimate aim - to sustain its global leadership and serve customers around the globe.

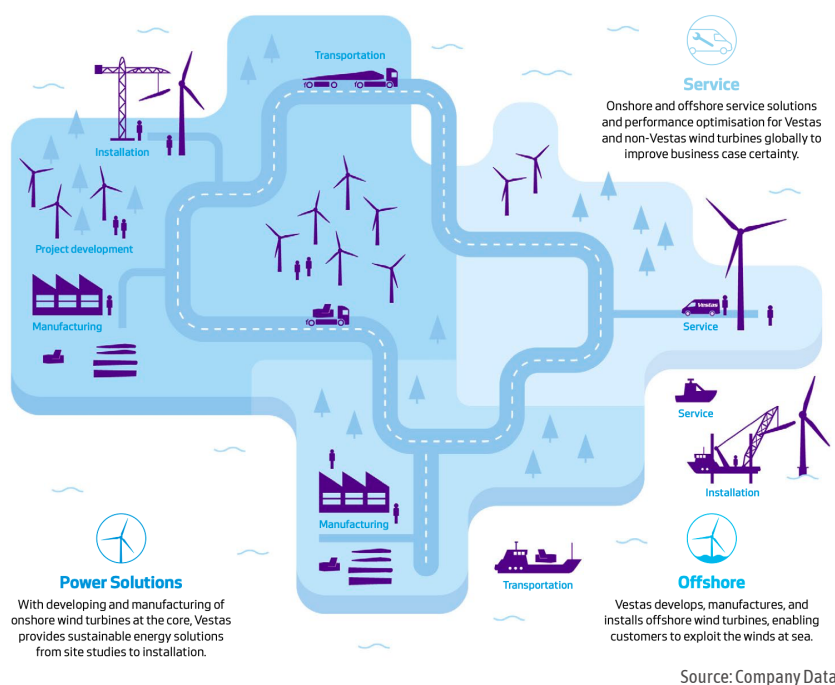


Source: EnVentus brochure

## Appendix B4 - Business model

From the little Taiwanese boy reading under the night lamp after bedtime to the massive data centers in Finland, Vestas' goal is to power people, sustainably and on a global scale. Vestas is a leading player in the wind OEM market, offering premium onshore and offshore turbines accompanied by service solutions. The company's strategy has always been to stay ahead of competitors by being at the technological forefront. As a result, Vestas has become synonymous with state-of-the-art technology, securing a lead in both the onshore and service segments.

At the core of Vestas' culture are its values of **accountability**, **collaboration**, **simplicity** and **passion**. Strongly abiding by these values, it is able to generate value for its employees, customers, shareholders, and the environment. Vestas creates truly sustainable local jobs by investing heavily in local supply chain, manufacturing and service. As a company that aims to contribute towards a greener future, it attracts talent equally passionate to make an impact. Vestas is in constant pursuit of optimizing solutions for its customer base; thereby creating value for its shareholders.



### Service outlook and priorities:

Vestas' plan is to maintain its high-end service leadership by delivering technical expertise, longer duration contracts and offer solutions tailored to customers' needs. Central to this goal is to continue its pioneering work in predictive analytics and machine learning in order to always be one step ahead of its competitors.

### Offshore outlook and priorities:

Vestas' newly launched offshore turbine is a flagship product, which the offshore market witnessed for the first time ever. By ramping up its production and incrementally improving it, Vestas wants to position itself as a leading offshore player. In addition, its objective is to develop floating offshore wind power and Power-to-X.

**Onshore outlook and priorities:** The biggest goal for the upcoming years is to continue providing best-in-class turbines at a lower LCOE than competitors. By maintaining market leadership in core regions and expanding into new regions (Brazil, India, China, South Africa, Russia, Columbia, Vietnam), Vestas aims to grow faster than the market.

## Appendix B5 - MVOW acquisition

### Acquisition details:

- When did Vestas purchase 50% of the remaining shares of MVOW?
  - December, 2020
- What is the main rationale behind the acquisition?
  - to capture anticipated growth of 11,5% CAGR in offshore wind over the next two decades
  - to realize synergies between onshore and offshore segment and attain managerial know-how
  - to broaden its customer base and establish offshore leadership
  - to benefit from the geographic synergies based on close proximity between production facilities and largest offshore European markets
  - to expand into a new service revenue stream as offshore turbines require high maintenance due to high wear and tear
- Why do we believe this acquisition occurred at a discount?
  - It can be equated to an accretive acquisition, which occurs when the P/E ratio of the acquiring firm (Vestas) is greater than that of the target firm (MHI Vestas)
  - Vestas' P/E multiple of 59 > MHI Vestas' P/E multiple of 31.5
  - MHI Vestas' multiple was calculated as the equity value (2x the amount paid for the remaining 50% of shares) divided by the Net adj. profit

$$\frac{709m \times 2}{45m} = 31.5$$



Source: Team Analysis

## Appendix C1 - ESG scorecard

The ESG scorecard consists of a comparison of different metrics between Vestas and its peers. Vestas is outperforming the majority of its peers.

Company	RobecoSaM	Sustainable EGS rank	ISS Quality Score	RSG Disclosure Score	GHG Emission Intensity/Sales	Waste Intensity/Sales
Median	22.0	65.5	4	46.7	7.9	5.7
Vestas vs Median	Better than median	Better than median	Better than median	Better than median	Near median	Better than median
Vestas	79.0	88.1	1.0	49.3	9.0	7.0
Siemens Gamesa	81.0	66.7	3.0	56.6	6.9	5.7
Xinjiang Goldwin	20.0	38.1	5.0	49.2	24.2	0.1
Nordex	22.0	64.3	5.0	44.2	4.9	6.0

Source: Bloomberg, Team Analysis

## Appendix C2 - Corporate governance scorecard

### Board of Directors

26.40 / 30.00

Aligned board that reduces potential agency problems	30.00
Board members independent and owners of shares	25.00
Decisive board that makes decisions efficiently	25.00
Informed board that can good monitoring and advice	25.00
Gender balance	15.00
Board ensures the company implements sound corporate governance	25.00
Audit committee with non-executive members	30.00
Compensation committee mainly composed by non-executive members	25.00
Nomination committee to decide executives and directors	30.00
Separation of chairman and CEO role	30.00
Board ensures there are adequate systems to identify and manage significant risks	30.00

### Stakeholders - CSR

4.80 / 5.00

Good performance in terms of ESG	5.00
CSR issues included in business model and decision-making processes	4.00
Committed to UN sustainable development goals	5.00
Stated interest and scope of increasing social welfare	5.00

### Transparency and Disclosure

27.90 / 30.00

Reports on corporate governance and code of conduct	30.00
Clear business objectives, strategy, risks, and value creation to society	30.00
Annual report includes explanatory statements about business model and financial strategy	30.00
Annual and quarterly reports delivered consistently and on time	30.00
Adequate disclosure of annual accounts	25.00
Increased transparency on issues of high stakeholder interest	25.00
Transparency - Financial statements	25.00

### Shareholders

27.90 / 30.00

Classes of stock with the same voting rights	30.00
Ceiling on ownership/voting rights and compliance	25.00
No priority rights to any shareholder	30.00
Transparent and clear dividend policy	30.00
Annual General Meeting held yearly with a clear agenda	30.00
Shareholder value maximization within capital management	25.00
No apparent violations of minority shareholders' rights	25.00

### Executive Compensation

4.50 / 5.00

Compensation creates long-term incentives for management	5.00
Compensation composed by several parts: base pay, bonus, and equity	5.00
Capped executive bonuses	5.00
Floor on compensation: not excessive and unnecessary risk taking	3.00

### OVERALL SCORE

91.50/100

Source: Company Data, Team Analysis

**Evaluation Rubric:**  
60% - 70% Satisfactory  
70% - 80% Good  
80% - 90% Very Good  
90% - 100% Excellent



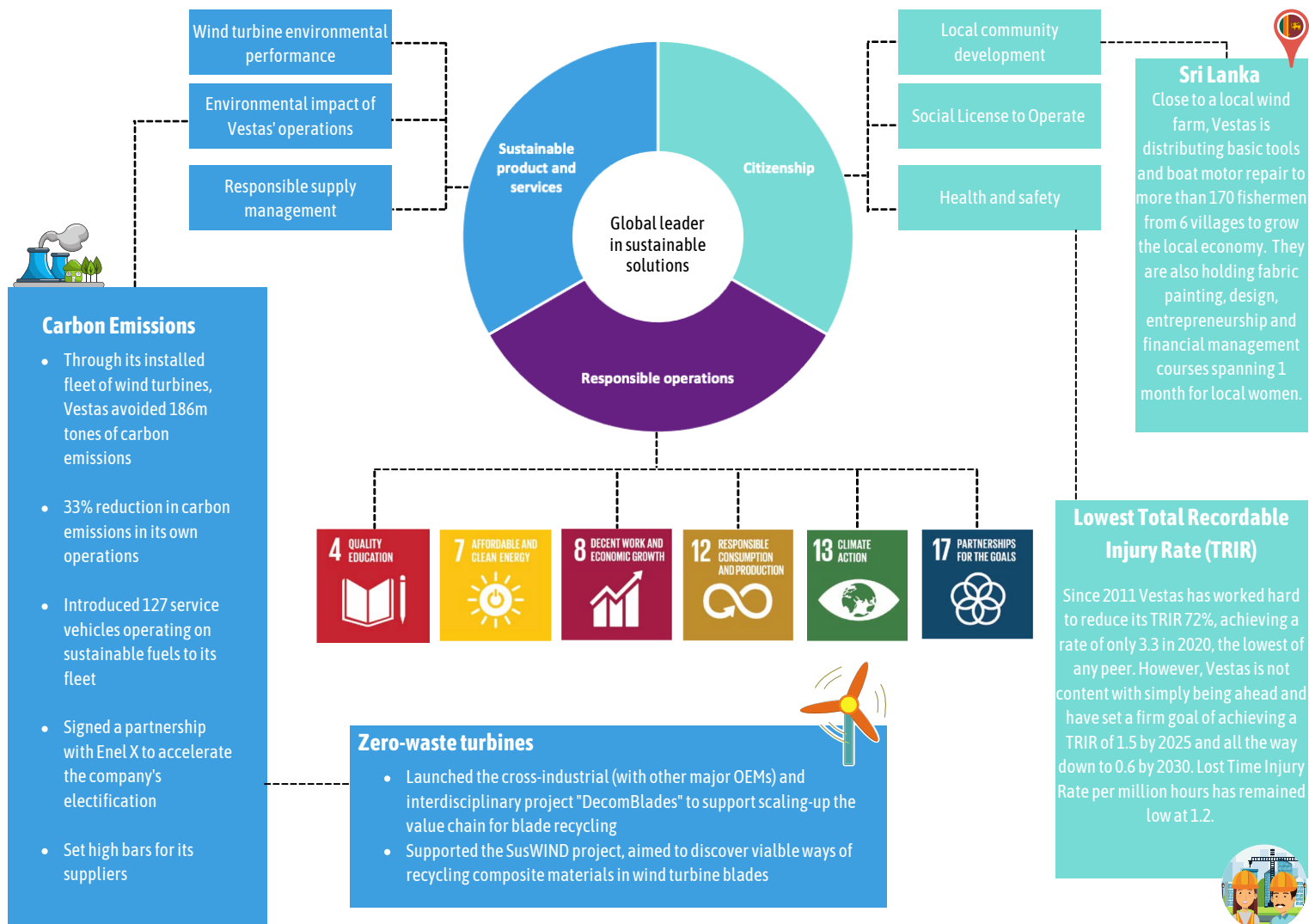


## Appendix C3 - ESG targets and status

Environmental	Unit	Targets	2020	2019	2018	2017
Renewable electricity for own operations	Percent	100%	100	82	68	66
Carbon footprint	Co2 / kWh	Reduction of 55% (2025)	-	5.9	-	6.6
Direct Co2	1,000 tonnes	Reduction of 55% (2025)	89	71	69	60
Indirect Co2	1,000 tonnes	Reduction of 55% (2025)	2	38	61	70
Product waste	G / kWh	0 (2040)	-	0.17	-	0.18
<b>Total consumption of energy</b>	<b>GWh</b>		<b>638</b>	<b>638</b>		<b>569</b>
Social	Unit	Targets	2019	2019	2018	2017
Incidence of total recordable injuries	1 / m WH	1.5 (2025), 0.6 (2030)	3.3	3.9	4.0	5.3
Gender diversity in leadership position	Percent	25 (2025), 30 (2030)	19	19	19	19
Gender diversity in Executive Management	Percent		29	23	20	20
Employee Survey Score	Index		75	71	71	71
Employee turnover	Percent		11.9	13.8	13.8	13.6
Governance	Unit	Targets	2019	2019	2018	2017
Gender diversity BoD	Percent	37.5% (2021)	33	25	12.5	25
Board meeting attendance	Percent		-	97	98	97

Source: Company Data, Team Analysis

## Appendix C4 - Sustainable solutions at Vestas

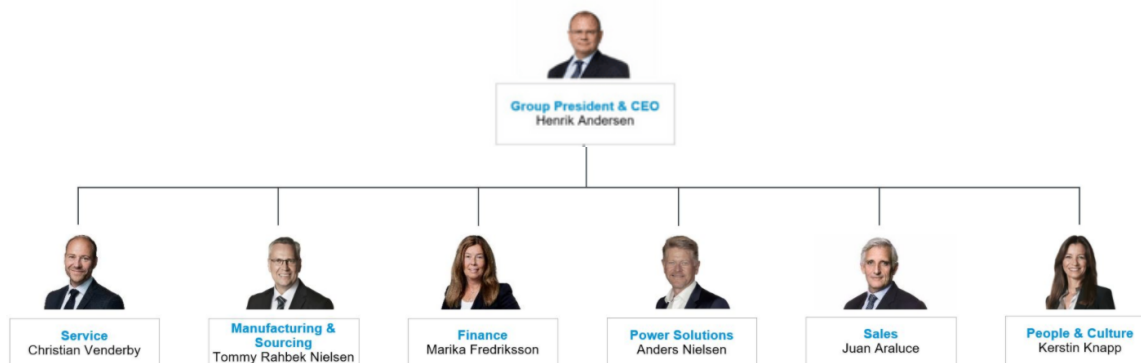


Source: Company Data, Team Analysis

## Appendix C5 - Overview of board members

Name	Position	Member since	Number of shares	Independent	Resident	Education	Professional competencies	Work Experience
Bert Nordberg	Chairman	2012	14,600	Yes	Sweden	<ul style="list-style-type: none"> <li>Finance</li> <li>Degree in Electronic Engineering</li> </ul>	<ul style="list-style-type: none"> <li>Professional Board Member</li> </ul>	<ul style="list-style-type: none"> <li>Sigma Connectivity AB</li> <li>TDCA/S</li> </ul>
Lars Josefsson	Deputy Chairman	2012	3,500	Yes	Sweden	<ul style="list-style-type: none"> <li>Degree in Business economics</li> <li>MSc. School of En. Physics</li> </ul>	<ul style="list-style-type: none"> <li>International management</li> <li>R&amp;D, technology and production</li> </ul>	<ul style="list-style-type: none"> <li>CEO, Micronic Mydata AB</li> </ul>
Anders Runevad	Member	2020	8,096	Yes	Sweden	<ul style="list-style-type: none"> <li>MBA Studies</li> <li>MSc. Electrical Engineering</li> </ul>	<ul style="list-style-type: none"> <li>The renewable industry</li> </ul>	<ul style="list-style-type: none"> <li>Group President and CEO, Vestas</li> </ul>
Carsten Bjerg	Member	2011	4,019	Yes	Denmark	<ul style="list-style-type: none"> <li>ACPMM</li> <li>BSc. Engineering</li> </ul>	<ul style="list-style-type: none"> <li>International management</li> <li>R&amp;D, manufacturing</li> </ul>	<ul style="list-style-type: none"> <li>Group President, Grundfos Holding A/S</li> </ul>
Eva Merete Søfelde Berneke	Member	2019	2,159	Yes	Denmark	<ul style="list-style-type: none"> <li>Masters' of Mechanical Engineering</li> <li>Masters' of Economics</li> </ul>	<ul style="list-style-type: none"> <li>Corporate management and strategy</li> <li>Digitalization &amp; IT</li> </ul>	<ul style="list-style-type: none"> <li>Group President, Grundfos Holding A/S</li> </ul>
Bruce Grant	Member	2019	0	Yes	USA	<ul style="list-style-type: none"> <li>PhD Cand. Industrial Management</li> <li>MSc. Business Economics</li> </ul>	<ul style="list-style-type: none"> <li>Implementation of renewable energy</li> <li>US Market &amp; Steel Market</li> </ul>	<ul style="list-style-type: none"> <li>President, Arthur D. Little North America and Scandinavia</li> </ul>
Helle Thorning-Schmidt	Member	2019	0	Yes	UK	<ul style="list-style-type: none"> <li>Masters' in European Studies</li> <li>Masters' in Political Science</li> </ul>	<ul style="list-style-type: none"> <li>Governmental affairs &amp; political environments</li> <li>Strategic Management</li> </ul>	<ul style="list-style-type: none"> <li>CEO, Save the Children International</li> <li>Prime Minister of Denmark</li> </ul>
Karl-Henrik Lundström	Member	2020	1,640	Yes	Sweden	<ul style="list-style-type: none"> <li>Advanced management program</li> </ul>	<ul style="list-style-type: none"> <li>Sustainability, strategy, accounting &amp; finance</li> <li>Marketing &amp; sales</li> </ul>	<ul style="list-style-type: none"> <li>CEO, Stora Enso AB</li> </ul>
Sussie Dvinge Agerbo	Member	2005	800	Employee Representative, No	Denmark		<ul style="list-style-type: none"> <li>Project management &amp; Organizational structure</li> </ul>	<ul style="list-style-type: none"> <li>Management Assistant, Vestas</li> </ul>
Kim Hvid Thomsen	Member	1996	2,060	Employee Representative, No	Denmark		<ul style="list-style-type: none"> <li>Production process &amp; human resources</li> </ul>	<ul style="list-style-type: none"> <li>HR Business Partner, Vestas</li> </ul>
Michael Abildgaard Lisbjerg	Member	2008	834	Employee Representative, No	Denmark		<ul style="list-style-type: none"> <li>Production process &amp; human resources</li> </ul>	<ul style="list-style-type: none"> <li>Production &amp; Shop Steward, Vestas Wind Systems A/S</li> </ul>
Pia Kirk Jensen	Member	2008	158	Employee Representative, No	Denmark		<ul style="list-style-type: none"> <li>Mobility patterns of the organization</li> </ul>	<ul style="list-style-type: none"> <li>Global travel manager, Vestas Wind Systems A/S</li> </ul>

## Appendix C6 - Executive management



Name	Position	Appointed	Resident	Education	Work Experience
Henrik Andersen	Group President and CEO	2019	Denmark	<ul style="list-style-type: none"> <li>Graduate Diploma in International Business</li> <li>Master in Law at Aarhus</li> </ul>	<ul style="list-style-type: none"> <li>Group President and CEO, Hempel A/S</li> <li>Group Chief Operating Officer, EMEA, ISSA/S</li> </ul>
Marika Fredriksson	Executive Vice President and CFO	2013	Denmark	<ul style="list-style-type: none"> <li>Master's degree, Swedish School of Economics (FI)</li> </ul>	<ul style="list-style-type: none"> <li>Senior Vice President &amp; CFO, Gambro AB</li> <li>Senior Vice President Finance &amp; CFO, Autoliv, Inc</li> </ul>
Anders Nielsen	Executive Vice President and CTO	2020	Denmark	<ul style="list-style-type: none"> <li>Industrial Economy at the Linkjøping Institute of technology</li> </ul>	
Tommy Nielsen	Executive Vice President and COO	2020	Denmark	<ul style="list-style-type: none"> <li>Finance and Business Administration at Aarhus University</li> </ul>	
Juan Araluce	Executive Vice President and CSO (sales)	2007	Denmark	<ul style="list-style-type: none"> <li>Industrial Engineer at Complutense University in Madrid</li> </ul>	
Christian Venderby	Executive Vice President and CFO (service)	2006	Denmark	<ul style="list-style-type: none"> <li>Executive Development - CEDEP</li> </ul>	
Kerstin Knapp	Executive Vice President and CPO	2020	Denmark	<ul style="list-style-type: none"> <li>Master's in Business Administration in CBC</li> </ul>	

Source: Company Data

## Appendix C7 - Shareholders and insider transactions

### The executive management's shareholdings as of 31st of December 2020 (EUR)

Name	Position	1 Jan 2020				31 Dec 2020					
		Holding (number)	Purchase (number)	Vesting (number)	Sale (number)	Holding (number)	Net Change	Share price	Value of position	Pct. of base salary	Share holding
Henrik Andersen	CEO	12,700	-	-	575	12,125	-575	193	2,341,735	156%	Met
Marika Fredriksson	CFO	30,653	3,000	19,435	10,884	42,204	+11,551	193	8,150,977	835%	Met

Source: Company Data

## Board members shareholdings as of 31st of December 2020

Name	Member since	Holdings 1st of January 2020	Change	Holdings 31st of December 2020	Shareholding obligation
Bert Nordberg	2012	14,600	-	14,600	Met
Lars Josefsson	2012	3,500	-	3,500	Met
Anders Runevad	2020	8,096	-	8,096	Met
Bruce Grant	2019	-	-	-	In progress
Carsten Bjerg	2011	4,019	-	4,019	Met
Eva Merete Søfelde Berneke	2019	1,000	1,159	2,159	Met
Helle Thorning Schmidt	2019	-	-	-	In progress
Karl-Henrik Sundstrøm	2019	-	1,640	1,640	Met
<b>Total</b>		<b>31,215</b>	<b>14,600</b>	<b>14,600</b>	

Source: Company Data

Vestas is listed at Nasdaq Copenhagen and part of the OMX C25 Index. Shareholders hold around 98% of share capital, with approximately 140,560 shareholders. BlackRock Inc, Wilmington, DE USA is Vestas majority shareholder, with approximately 5.36% of the total share capital.

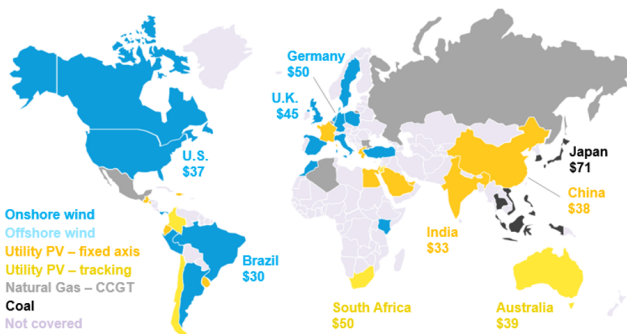
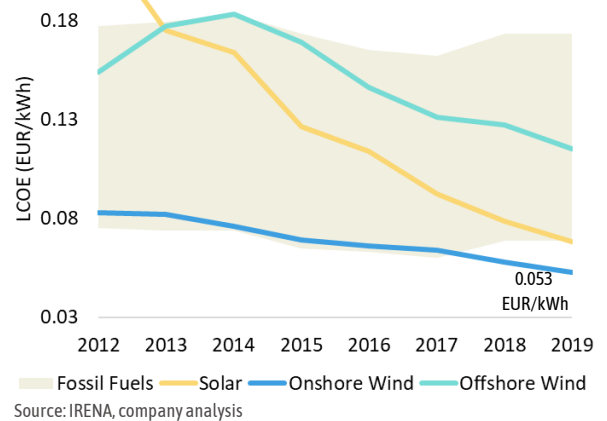
During 2020, Vestas has had an increase of new investors, and only one institutional investor has closed their position. Their largest institutional owners are BlackRock Inc, Parametric Portfolio Associates LLS, Boston Common Asset Management LCC and Grace & White Inc/NY (Nasdaq).

No board members sold shares during 2020 despite strong price appreciation, and insiders in total purchased net shares of 13,775, affirming our belief that the best is still ahead for Vestas.

## Appendix D1 - Wind Versus Solar

### Wind and solar - stepping into the future hand in hand

Through strong technological innovation, both solar and onshore wind become able to deliver electricity at a lower LCOE than fossil fuels. This has positioned them as the clear front runners for the renewable transition with investors lining up to get a piece of the pie. This will gain critical momentum over the next few years as it is expected to become cheaper to build a brand new wind park than operate existing natural gas or coal plants. This means developing countries, previously unable to afford to subsidize the shift towards renewable energy sources, will be economically incentivized to build green.

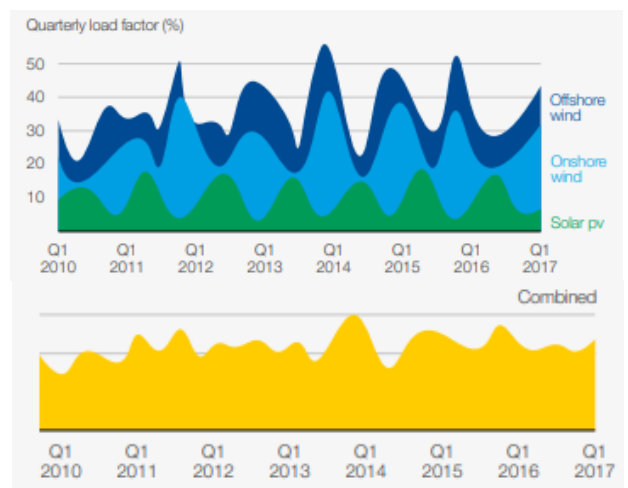


### Clear geographical advantages

Wind has edged ahead of solar, both on costs and significantly lower CO2 pollution per kWh, but that is only on a global level. Regionally the two sources very drastically depending on weather conditions and climate. This means neither source is likely to dominate the other globally, but that they will both penetrate the electricity mix in different regions. As can be seen from the map to the left showing the cheapest source of bulk electricity, wind is superior in Europe and America. These developed markets favouring wind is highly beneficial for Vestas as they provide high and stable demand due to strong economies, high electricity usage and a strong social push towards the renewable transition.

### Complementary as hybrid solutions

Both wind and solar are variable sources of electricity. As they grow as a portion of the electricity mix this creates an intermittency problem where the variable output of renewables cannot provide on-demand electricity depending on societies needs. However, as the sun does not usually shine while the wind blows the strongest their variability can complement and partially cancel each other out. Vestas is investing heavily in hybrid solutions combining wind power, solar and EV/hydrogen storage. Despite solar being the largest threat to wind, using solar in combination with wind will allow wind power to become a much larger portion of the energy mix without the need for on-demand fossil fuels.





## Appendix D2 - Porter's five forces analysis

### BARGAINING POWER OF SUPPLIERS - 3

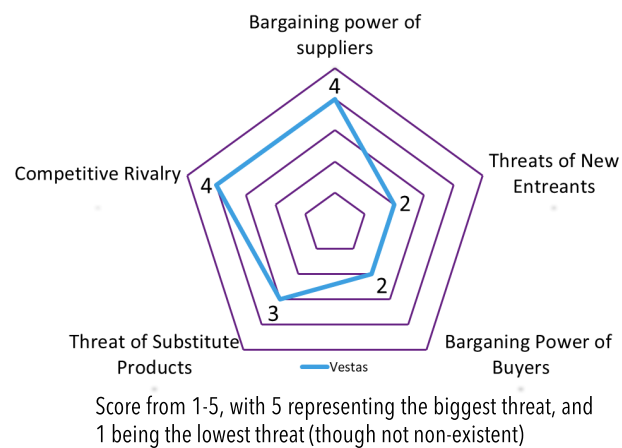
- More sophisticated customers
- Service contract length locks in customers
- Few alternative wind turbine OEMs
- More developers (customers) in the market than wind turbine OEMs
  - Oil giants have oversaturated the developer market
- Developers switch their turbine OEMs depending on LCOE considerations
- Not really strong geographic preferences for wind turbine OEMs (except in China)
- Developers pre-pay partial upfront cost before deliveries start, lowering Vestas' required project capital

### BARGAINING POWER OF BUYERS - 2

- Plenty of supplier options for wind turbine components
- Certain national regulations and funding sources require that some components are made in certain countries, which limit Vestas' suppliers in certain OEM contracts (e.g. UK and US)
- Specialty construction equipment limiting subcontractors that could ship equipment globally (e.g. tractor trailers and vessels)
- Raw materials such as metal alloys and composites which are used to make the turbine parts are readily available

### THREAT OF NEW ENTRANTS - 2

- Manufacturing:
  - High investment cost
  - Expensive, highly specialized machinery
  - Several engineers and technicians to support development
  - Quality products difficult to replicate
  - Expansive / robust system of quality assurance with proprietary knowledge
- Service:
  - Need speciality equipment and specially trained technicians to prevent injury & death
  - Intellectual property rights; current turbine service OEMs unlikely to provide data
  - Need a network of data collectors & data processors to match / beat current warranty contracts issued by Vestas and peer-group
  - Lure of high margins; however, historically acquired once successful
- R&D
  - Certain specialty aspects can be replicated by a smaller group of people / inventors
  - Need a wide-range of engineering specialties and different levels of experience to build and service an entire turbine
  - Circumvented in regions like China by not adhering to international patents



### THREAT OF SUBSTITUTE PRODUCTS - 4

- Although wind is the only practical renewable energy in certain geographic areas due to solar irradiance conditions, there is direct competition between solar, natural gas, and nuclear power in key geographic markets
- Competition for lowest LCOE among the different renewable energy technologies
- No renewable source will succeed on its own without hybrid solutions allowing a more consistent, predictable power production

### COMPETITIVE RIVALRY - 4

- 3 truly global international, non-Chinese, turbine OEMs (Vestas, Siemens Gamesa, and GE); competition among the 3 is fierce
- All 3 major wind turbine OEMs are pursuing the same strategy of producing the best-in-class onshore and offshore turbine at the lowest LCOE
- All 3 major wind turbine OEMs are heavily investing in R&D to produce larger nominally rated turbines, but Vestas' peers are constrained by financial capacity
- All 3 major wind turbine OEMs are heavily investing in provided integrated, data-driven service and maintenance warranties; although this appears to be more of Vestas' focus than other wind turbine OEMs
- Additional competition from regional wind turbine OEMs (e.g. Nordex and Enercon in Europe; Goldwind and Envision in China) placing pressure on key markets
- Onshore competition indicative by eroding EBIT margin for turbine OEMs over the years
- Leverage constraints keep competitors in check

## Appendix D3 - Peer Comparison

NI margin %	2015A	2016A	2017A	2018A	2019A	5-Year Average
Vestas	8%	9%	9%	7%	6%	8%
Siemens Gamesa		—	—	1%	1%	1%
Xingjiang Goldwind	10%	11%	12%	11%	6%	10%
Inox Wind	11%	10%	9%	-39%	-3%	-2%
Nordex	2%	3%	1%	-3%	-2%	0%
<b>Sector Average</b>	<b>8%</b>	<b>8%</b>	<b>8%</b>	<b>-5%</b>	<b>2%</b>	<b>4%</b>
Operating margin %						
Vestas	11%	14%	12%	9%	8%	11%
Siemens Gamesa	9%	—	—	2%	2%	5%
Xingjiang Goldwind	11%	13%	12%	15%	8%	12%
Inox Wind	15%	16%	15%	-28%	6%	5%
Nordex	5%	4%	1%	-2%	-1%	1%
<b>Sector Average</b>	<b>10%</b>	<b>12%</b>	<b>10%</b>	<b>-1%</b>	<b>5%</b>	<b>7%</b>
ROE (%)						
Vestas	26%	32%	28%	22%	22%	26%
Siemens Gamesa	12%	—	—	1%	2%	5%
Xingjiang Goldwind	18%	17%	15%	14%	8%	14%
Inox Wind	33%	28%	15%	-9%	-2%	13%
Nordex	12%	14%	0%	-10%	-10%	1%
<b>Sector Average</b>	<b>20%</b>	<b>23%</b>	<b>15%</b>	<b>4%</b>	<b>4%</b>	<b>13%</b>
ROIC (%)						
Vestas	22%	28%	22%	17%	19%	22%
Siemens Gamesa	19%	—	—	1%	2%	8%
Xingjiang Goldwind	11%	9%	6%	8%	5%	8%
Inox Wind	20%	18%	10%	-3%	2%	9%
Nordex	9%	8%	1%	-3%	-3%	2%
<b>Sector Average</b>	<b>16%</b>	<b>16%</b>	<b>10%</b>	<b>4%</b>	<b>5%</b>	<b>10%</b>
Book D/E (%)						
Vestas	17%	16%	16%	16%	25%	18%
Siemens Gamesa	36%	—	20%	33%	15%	26%
Xingjiang Goldwind	72%	112%	113%	84%	67%	90%
Inox Wind	61%	76%	70%	41%	56%	61%
Nordex	51%	82%	80%	93%	95%	80%
<b>Sector Average</b>	<b>47%</b>	<b>71%</b>	<b>60%</b>	<b>54%</b>	<b>52%</b>	<b>57%</b>

Source: Bloomberg, Team Analysis



Siemens Gamesa is one of the leading global suppliers of wind power solutions, headquartered in Spain, and Vestas' biggest competitor. Similarly to Vestas, it offers onshore and offshore turbines as well as service. Our analysis shows that SGRE poses bigger threat for the offshore segment than the onshore one. However, Vestas is currently dominating both markets. One of the key differences between the companies is that SGRE tries to pursue new markets at the expense of lower prices, whereas Vestas maintains strict pricing discipline.

GE Renewable Energy is a division of General Electric, offering wind, hydro, solar and hybrid solutions, headquartered in Paris. With a strong parent company working in a similarly technical field, it is Vestas' second biggest competitor. Outside of Vestas and SGRE, they are the third biggest player in the offshore market excluding China.



GE Renewable Energy



Goldwind is a Chinese-based wind OEM, headquartered in Beijing. Together with Vestas, SGRE and GE, it was responsible for 56% of the installed wind capacity in 2019. Nonetheless, Goldwind is dominating only the domestic market, and has a business model (low upfront costs, high future maintenance costs) that is ill-suited for international expansion.





Inox Wind is a wind OEM originating from India, headquartered in Noida. In a similar fashion to Vestas, it aims to build a fully integrated supply chain. However, its margins have fallen in the negative territory for two consecutive years.



Nordex is a wind OEM company, offering both turbines and service, headquartered in Germany. Similarly to Inox Wind, it has struggled with maintaining positive margins, ROE and ROIC for two years in a row.

Source: Companies' Websites, Team Analysis

## Appendix D4 - SWOT Analysis

S Strengths 	W Weaknesses 	O Opportunities 	T Threats 
<ul style="list-style-type: none"> <li>• Global operations in 83 countries</li> <li>• Superior technology, allowing Vestas to provide lower cost of energy                             <ul style="list-style-type: none"> <li>◦ Both through service allowing low long term costs and turbine manufacturing allowing lower lower costs per energy unit (as their turbines are more efficient)</li> </ul> </li> <li>• Strict pricing discipline giving higher profitability</li> <li>• Strong financial strength and healthy balance sheet</li> <li>• Flagship ESG status</li> <li>• Strong customer relations</li> </ul>	<ul style="list-style-type: none"> <li>• Small market share in offshore - a key future market</li> <li>• Difficult to enter the Chinese market</li> <li>• Wind market still somewhat relies on government incentives</li> </ul>	<ul style="list-style-type: none"> <li>• Post-acquisition expansion in offshore through translating onshore and service lead and leveraging their superior offshore turbine</li> <li>• Renewable transition                             <ul style="list-style-type: none"> <li>◦ Favourable policies and heavy investments</li> <li>◦ High demand for renewable energy</li> <li>◦ Electrification of the entire energy system</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Competition both within wind and from alternative renewable sources</li> <li>• Protests in certain areas against onshore wind farm buildings</li> <li>• Potential cyber attacks</li> </ul>

Source: Team Analysis

## Appendix D5- Service as a long term offshore value driver

Source: Company Data, Team Analysis

Metric	Onshore		Offshore	
	Manufacturing and installation	Service	Manufacturing and installation	Service
Average New Contract Length	Immediate	19	Immediate	19
Revenue/GW 2021-2026	730	18 mEUR/Year	1264	25 mEUR/Year
Present Value Revenue	730	190	1264	466
Revenue contribution %	79%	21%	73%	27%
2026 EBIT Margin %	10%	27%	7%	27%
EBIT	69	50	86	127
<b>Lifetime EBIT contribution %</b>	<b>58%</b>	<b>42%</b>	<b>40%</b>	<b>60%</b>

We estimate that service will bring 60% of the EBIT contribution generated from offshore operations throughout the lifetime of each turbine. This is based on the 19 year average contract length for new service contracts, with service revenue discounted at a 6.72% WACC. This estimate is still on the conservative side as contracts are likely to be renewed, with the new 15.0MW turbine having an estimated 25 year lifespan (before Vestas' turbine lifetime extension service).

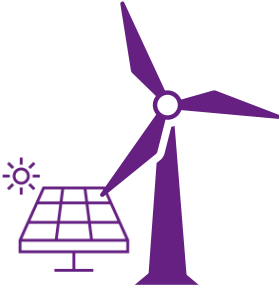




To calculate the EBIT contribution we use the 2026 EBIT margin for each segment. Although overall service margins are likely weighed down by offshore service margins in 2021-2024 we believe synergies and economies of scale will enable it to operate on par with the main service segment in the long run. It should be noted that the offshore GW under service are initially low, meaning lower offshore service margins will not have a material impact on overall margins in this period. Beyond our forecasted period we believe offshore service will be a strong value driver, substantially contributing to the terminal growth.

Vestas service segment's strong technological edge makes it uniquely positioned to capitalize on the high value generation from offshore service. The acquisition of MVOW allow Vestas to carry their high service margins into new, larger revenue streams. As offshore transitions from subsidized to auction based over the next few years, LCOE will become the prime factor for winning auctions. We anticipate Vestas to leverage their margin cushion in offshore service to provide lower LCOE (by reducing the long term costs while keeping upfront costs high) to rapidly grow their market share.

## Appendix D6 - Technology comparison with peers

In the table below, we have assigned a maximum of 3 points to Vestas and near-peers SGRE and GE based on their performance in key technologies.



Hybrid Solutions	3 points	1 point	2 points
	<ul style="list-style-type: none"> <li>3 major parks: Kennedy Energy Park (Australia), Terna Energy Louzes (Greece), Lem Kær (Denmark)</li> <li>First-mover advantage with first hybrid park from 2012</li> <li>Vestas' strategic partnership with Telsa &amp; other energy storage companies</li> <li>Obtain additional in-house energy storage knowledge thru Utopus acquisition</li> </ul>	<ul style="list-style-type: none"> <li>2 major parks: Kudgy wind park (India), Bulgana wind park (Australia)</li> <li>First hybrid plant in India in 2017</li> <li>Utility grade electrothermal energy storage in Hamburg, Germany using volcanic rock</li> <li>Boasts that 80% of components come off-the-shelf</li> </ul>	<ul style="list-style-type: none"> <li>GE pioneering wind, solar and thermal (natural gas)- Synergies from GEs other business units specifically grid solutions</li> <li>GE's Reservoir business unit, grid-scale energy storage system</li> <li>GE able to provide utility grade energy storage in-house versus using subcontractors</li> </ul>
Digitized Supply Chains	3 points	2 points	1 point
	<ul style="list-style-type: none"> <li>OEM for critical components used in wind turbines (e.g. pitch control system)</li> <li>Vestas' end-to-end value chain optimization called "Accelerate Earnings"</li> </ul>	<ul style="list-style-type: none"> <li>IT deal with Infosys to support cloud computing &amp; digital supply chains</li> <li>Company-wide hybrid cloud solution; single global System Applications and Products (SAP) system which will manage entire spare parts business</li> </ul>	<ul style="list-style-type: none"> <li>Leverage digitization across multiple green tech verticals (hydro, wind, solar) using GE's Digital Asset Performance Management (APM)</li> <li>GE's APM claims to work across all assets (rotating, non-rotating, and process) all OEMs (GE and non-GE equipment) and all industries</li> </ul>
Predictive Analytics & ML	3 points	1 point	2 points
	<ul style="list-style-type: none"> <li>\$100m acquisition of Utopus Insights to support digitalization of renewable energy assets and energy systems including visualization, predictive maintenance, and wind/solar forecasting</li> </ul>	<ul style="list-style-type: none"> <li>Diagnostic Center staffed by 130 analytics experts performing 34,000 analysis per year</li> <li>Diagnostics center since 1998 claiming a 85% remote fix rate and an average turbine availability of 97%</li> </ul>	<ul style="list-style-type: none"> <li>GE's organic Digital Asset Performance Management (APM) solutions claims 1-3% increased availability, 10% decrease in unplanned costs, 5 to 25% reduction in IT total cost of ownership, 3 to 40% Environment, Health &amp; Safety incident reduction, 5 to 25% gain in employee productivity</li> </ul>
Nameplate Capacity	3 points	2 points	2 points
	<ul style="list-style-type: none"> <li>Large 6 MW onshore model; most used OEM for onshore wind turbines</li> <li>15MW 230V offshore model; largest amongst peers</li> </ul>	<ul style="list-style-type: none"> <li>5.8 MW onshore model</li> <li>14 MW 222V offshore</li> </ul>	<ul style="list-style-type: none"> <li>6 MW onshore</li> <li>14 MW 220V offshore</li> </ul>
Additive Manufacturing	3 points	2 points	2 points
	<ul style="list-style-type: none"> <li>Partner with US Department of Energy to produce large components with AM including blades, towers &amp; heat exchangers</li> <li>Partner with Markforged to 3D print key components locally around the world.</li> </ul>	<ul style="list-style-type: none"> <li>Grant with University of Maine on Wind Blade design and development through additive manufacturing using cellulose nanofiber tech</li> </ul>	<ul style="list-style-type: none"> <li>Separate partnership with Oak Ridge National Labs (USA) for 3D printing of blade tips</li> <li>Leverage expertise for developing jet engine blades using AM</li> </ul>

Source: Team Analysis



## Appendix E1 - Revenue projections

Onshore revenue projections (mEUR)		2020A	2021E	2022E	2023E	2024E	2025E	2026E
AMERICAS	Installed capacity (MW)	15,700	14,423	14,853	13,341	14,698	15,058	15,660
	Vestas' market share	57%	51%	52%	53%	53%	54%	54%
	Vestas' deliveries (MW)	8,949	7,356	7,724	7,071	7,790	8,131	8,457
	Revenue	6,588	5,370	5,638	5,162	5,687	5,936	6,173
EMEA	Installed capacity (MW)	12,602	13,160	14,994	16,712	17,180	17,746	18,556
	Vestas' market share	58%	63%	59%	60%	60%	60%	60%
	Vestas' deliveries (MW)	5,289	8,327	8,788	10,027	10,308	10,648	11,134
	Revenue	4,163	6,079	6,415	7,320	7,525	7,773	8,128
APAC*	Installed capacity (MW)	7,501	8,829	5,987	5,744	6,331	7,536	9,174
	Vestas' market share	32%	19%	21%	23%	24%	29%	32%
	Vestas' deliveries (MW)	2,384	1,677	1,227	1,321	1,526	2,151	2,946
	Revenue	1,583	1,225	896	964	1,114	1,570	2,150
CHINA	Installed capacity (MW)	29,481	18,848	22,531	25,621	31,241	33,724	31,241
	Vestas' market share	2%	2%	2%	2%	2%	2%	2%
	Vestas' deliveries (MW)	590	377	451	512	703	759	625
	Revenue	430	275	329	374	513	554	456
GLOBAL	Vestas' Total Deliveries (MW)	17,212	17,737	18,189	18,931	20,327	21,689	23,161
	Selling price per MW	0.73	0.73	0.73	0.73	0.73	0.73	0.73
	Vestas combined market share	26%	32%	31%	31%	29%	29%	31%
	Vestas combined market share excl. China	46%	48%	50%	51%	51%	52%	52%
	<b>Total onshore revenue</b>	<b>12,764</b>	<b>12,948</b>	<b>13,278</b>	<b>13,820</b>	<b>14,838</b>	<b>15,833</b>	<b>16,907</b>
<i>Onshore revenue growth</i>	24%	1%	3%	4%	7%	7%	7%	
Offshore revenue projections (mEUR)		2020A	2021E	2022E	2023E	2024E	2025E	2026E
AMERICAS	Installed capacity (MW)	12	0	100	1,201	1,481	2,041	2,886
	Vestas' market share	0%	0%	0%	25%	26%	32%	34%
	Vestas' deliveries	0	0	0	300	385	653	981
	Revenue	<b>0</b>	<b>0</b>	<b>0</b>	<b>387</b>	<b>477</b>	<b>776</b>	<b>1,117</b>
EMEA	Installed capacity (MW)	2,784	2,966	3,852	3,102	3,423	3,804	4,687
	Vestas' market share	34%	40%	35%	34%	35%	43%	44%
	Vestas' deliveries	952	1,177	1,486	1,044	1,198	1,636	2,062
	Revenue	<b>1,379</b>	<b>1,634</b>	<b>1,990</b>	<b>1,345</b>	<b>1,484</b>	<b>1,944</b>	<b>2,348</b>
APAC*	Installed capacity (MW)	60	1,125	1,266	1,903	2,107	2,687	3,787
	Vestas' market share	0%	0%	18%	26%	27%	29%	33%
	Vestas' deliveries	0	0	234	494	569	779	1,250
	Revenue	<b>0</b>	<b>0</b>	<b>313</b>	<b>637</b>	<b>705</b>	<b>926</b>	<b>1,423</b>
CHINA	Installed capacity (MW)	3,589	5,308	2,367	2,504	2,758	3,211	5,083
	Vestas' market share	0%	0%	0%	0%	0%	2%	2%
	Vestas' deliveries	0	0	0	0	0	64	102
	Revenue	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>76</b>	<b>116</b>
GLOBAL	Installed capacity (MW)	6,445	9,399	7,585	8,710	9,769	11,743	16,443
	Vestas global market share	15%	13%	23%	21%	22%	27%	27%
	Vestas global market share excl. China	33%	29%	33%	30%	31%	36%	38%
	Vestas global deliveries (MW)	952	1,177	1,720	1,838	2,152	3,132	4,395
	Selling price per MW	1.45	1.39	1.34	1.29	1.24	1.19	1.14
<b>Total offshore revenue</b>	<b>1,379</b>	<b>1,634</b>	<b>2,303</b>	<b>2,368</b>	<b>2,665</b>	<b>3,723</b>	<b>5,004</b>	
<i>Offshore revenue growth %</i>	-4%	18%	41%	3%	13%	40%	34%	
Service revenue projections (mEUR)		2020A	2021E	2022E	2023E	2024E	2025E	2026E
GLOBAL	MW under service*	117,000	136,347	158,409	181,782	205,980	232,639	268,195
	MW Vestas	18,164	18,914	19,910	20,769	22,479	24,821	27,556
	MW Other	2,836	433	2,152	2,604	1,719	1,838	8,000
	Service revenue/MW	0.018	0.018	0.018	0.018	0.018	0.019	0.020
	<b>Service revenue</b>	<b>2,055</b>	<b>2,395</b>	<b>2,782</b>	<b>3,193</b>	<b>3,618</b>	<b>4,319</b>	<b>5,247</b>
<i>Service revenue growth %</i>	10%	17%	16%	15%	13%	19%	21%	

\*APAC is projected excluding China

Source: Company Data, Team Analysis

We project revenues for both the onshore and offshore segment regionally based on the current order backlog, explicit firm and unconditional orders, conditional orders and preferred supplier status for Vestas and MHI Vestas respectively. Due to long lead times making projectflow predictable we believe our forecast up to 2022 is highly accurate, and will only differ materially based on project delays primarily caused by Covid-19. We further use projections from Bloomberg and McKinsey on regional installed capacity for Americas, EMEA, China and APAC excl. China to complement our market analysis for 2023 and beyond. We use this in combination with our expectations for market share to arrive at Vestas' deliveries in MW. We further model our sales per MW based on an expectation of continued strict price market

share to arrive at Vestas' deliveries in MW. We further model our sales per MW based on an expectation of continued strict price discipline onshore and a falling price offshore to compete with onshore and solar on costs. To project MW under service, we use the MW delivered in onshore and offshore as well as a static capture rate of non-Vestas turbines. We base our price on historic revenue/MW under service and used this to arrive at our projected revenue. We believe the revenue/MW under service will increase the last two years as offshore becomes a larger portion of the revenue stream.

## Appendix E2 - Income Statement

Income Statement (mEUR)	2015A	2016A	2017A	2018A	2019A	2020E	2021E	2022E	2023E	2024E	2025E	2026E
<b>Total Revenue</b>	8,423	10,237	9,953	10,134	12,147	14,819	16,977	18,363	19,381	21,122	23,874	27,158
COGS	-6,918	-8,111	-7,990	-8,503	-10,386	-13,281	-14,838	-15,862	-16,551	-17,827	-19,911	-22,650
<b>Gross profit</b>	1,505	2,126	1,963	1,631	1,761	1,538	2,139	2,501	2,830	3,295	3,963	4,508
OPEX	-247	-300	-312	-252	-211	-156	-262	-193	-200	-208	-217	-225
<b>EBITDA</b>	1,258	1,826	1,651	1,379	1,550	1,382	1,877	2,308	2,629	3,087	3,746	4,283
Amortization	-171	-162	-155	-180	-212	-246	-272	-294	-310	-338	-382	-435
Depreciation	-178	-215	-243	-246	-334	-384	-355	-453	-569	-670	-797	-952
Impairment	-3	-28	-23	-32	0	-54	0	0	0	0	0	0
<b>EBIT</b>	906	1,421	1,230	921	1,004	698	1,250	1,562	1,750	2,079	2,567	2,897
Interest expense	19	-134	-38	-11	-95	236	283	340	408	489	587	587
<b>EBT</b>	925	1,287	1,192	910	909	934	1,534	1,902	2,158	2,568	3,154	3,484
Income tax expense	-240	-322	-298	-227	-209	-163	-337	-418	-475	-565	-694	-766
<b>Net Profit</b>	<b>685</b>	<b>965</b>	<b>894</b>	<b>683</b>	<b>700</b>	<b>771</b>	<b>1196</b>	<b>1483</b>	<b>1683</b>	<b>2003</b>	<b>2460</b>	<b>2717</b>

Source: Company Data, Team Analysis

## Appendix E3 - Balance Sheet

Balance Sheet - Assets (mEUR)	2015A	2016A	2017A	2018A	2019A	2020E	2021E	2022E	2023E	2024E	2025E	2026E
Intangible assets	687	828	901	1,096	1,208	2,888	2,904	2,922	2,941	2,961	2,984	3,010
Property, plant and equipment	1,279	1,329	1,247	1,318	1,671	2,022	3,022	3,856	4,845	5,703	6,791	8,105
Investment in joint ventures and ass	225	201	150	233	169	57	57	57	57	57	57	57
Other investments	20	26	30	35	65	69	79	90	102	117	133	151
Tax receivables	109	49	51	98	156	201	201	201	201	201	201	201
Deferred tax	149	208	218	281	324	335	335	335	335	335	335	335
Other receivables	39	55	72	79	85	241	246	251	256	261	266	271
Financial Investments	0	190	196	204	211	100	100	100	100	100	100	100
<b>Total non-current assets</b>	<b>2,508</b>	<b>2,886</b>	<b>2,865</b>	<b>3,344</b>	<b>3,889</b>	<b>5,913</b>	<b>6,944</b>	<b>7,812</b>	<b>8,837</b>	<b>9,734</b>	<b>10,866</b>	<b>12,230</b>
Inventories	1,899	1,985	2,696	2,987	4,098	5,289	5,772	6,244	6,589	7,181	8,022	9,234
Trade receivables	795	1,038	1,144	967	1,460	1,538	1,867	2,020	2,132	2,323	2,626	2,987
Contract assets	15	19	82	330	528	775	925	1,075	1,225	1,375	1,525	1,675
Contract costs	0	0	0	328	418	369	519	669	819	969	1,119	1,269
Tax receivables	60	25	53	88	125	121	121	121	121	121	121	121
Other receivables	442	322	371	515	752	981	1,059	1,144	1,236	1,335	1,441	1,557
Financial investments	0	11	7	422	173	111	111	111	111	111	111	111
Cash and cash equivalents	2,765	3,550	3,653	2,918	2,888	3,063	2,377	2,538	2,580	3,130	3,638	4,146
<b>Total current assets</b>	<b>5,976</b>	<b>6,950</b>	<b>8,006</b>	<b>8,555</b>	<b>10,442</b>	<b>12,247</b>	<b>12,752</b>	<b>13,922</b>	<b>14,813</b>	<b>16,546</b>	<b>18,603</b>	<b>21,100</b>
<b>Non-current assets held for sale</b>	<b>103</b>	<b>95</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>Total Assets</b>	<b>8,587</b>	<b>9,931</b>	<b>10,871</b>	<b>11,899</b>	<b>14,331</b>	<b>18,160</b>	<b>19,696</b>	<b>21,734</b>	<b>23,650</b>	<b>26,280</b>	<b>29,469</b>	<b>33,330</b>
<b>Balance Sheet - Liabilities (mEUR)</b>	<b>2015A</b>	<b>2016A</b>	<b>2017A</b>	<b>2018A</b>	<b>2019A</b>	<b>2020E</b>	<b>2021E</b>	<b>2022E</b>	<b>2023E</b>	<b>2024E</b>	<b>2025E</b>	<b>2026E</b>
Share capital	30	30	29	28	27	27	27	27	27	27	27	27
Other reserves	138	61	37	22	-67	-146	-146	-146	-146	-146	-146	-146
Retained earnings	2,731	3,099	3,046	3,042	3,333	4,773	5,584	6,469	7,411	8,572	10,031	11,518
Equity attributable to Vestas				3,092	3,293	4,654	5,465	6,350	7,292	8,453	9,912	11,399
Non-controlling interests				12	52	49	49	49	49	49	49	49
<b>Total equity</b>	<b>2,899</b>	<b>3,190</b>	<b>3,112</b>	<b>3,104</b>	<b>3,345</b>	<b>4,703</b>	<b>5,514</b>	<b>6,399</b>	<b>7,341</b>	<b>8,502</b>	<b>9,961</b>	<b>11,448</b>
Provisions	314	457	483	491	459	696	542	559	574	591	618	602
Deferred tax	20	34	61	120	147	158	163	168	173	178	183	188
Financial debts	495	496	497	498	661	867	1,040	1,248	1,498	1,798	2,157	2,589
Tax payables	44	37	166	212	296	331	340	367	388	422	477	543
Other liabilities	10	90	19	69	76	173	173	173	173	173	173	173
<b>Total non-current liabilities (long term)</b>	<b>883</b>	<b>1,114</b>	<b>1,226</b>	<b>1,390</b>	<b>1,639</b>	<b>2,225</b>	<b>2,258</b>	<b>2,516</b>	<b>2,806</b>	<b>3,162</b>	<b>3,608</b>	<b>4,095</b>
Financial debts	0	0	0	0	159	487	497	507	517	527	537	547
Prepayments from customers	2,258	3,002	2,923	0	0	0	0	0	0	0	0	0
Contract liabilities	17	73	159	4,202	5,020	5,613	5,772	6,244	6,589	7,181	7,879	8,962
Trade payables	1,760	1,666	2,660	2,417	3,119	3,608	3,905	4,224	4,458	4,858	5,312	5,975
Provisions	124	131	148	126	221	580	605	630	655	680	705	730
Tax payables	147	191	108	112	128	86	238	257	271	296	334	380
Other liabilities	499	564	535	548	700	858	908	958	1,013	1,073	1,133	1,193
<b>Total current liabilities (short term)</b>	<b>4,805</b>	<b>5,627</b>	<b>6,533</b>	<b>7,405</b>	<b>9,347</b>	<b>11,232</b>	<b>11,924</b>	<b>12,819</b>	<b>13,503</b>	<b>14,615</b>	<b>15,900</b>	<b>17,787</b>
<b>Total liabilities</b>	<b>5,688</b>	<b>6,741</b>	<b>7,759</b>	<b>8,795</b>	<b>10,986</b>	<b>13,457</b>	<b>14,183</b>	<b>15,335</b>	<b>16,310</b>	<b>17,777</b>	<b>19,508</b>	<b>21,882</b>
<b>Total equity and liabilities</b>	<b>8,587</b>	<b>9,931</b>	<b>10,871</b>	<b>11,899</b>	<b>14,331</b>	<b>18,160</b>	<b>19,696</b>	<b>21,734</b>	<b>23,650</b>	<b>26,280</b>	<b>29,469</b>	<b>33,330</b>

Source: Company Data, Team Analysis

## Appendix E4 - Cash Flow Statement

Cash Flow Statement (mEUR)	2015A	2016A	2017A	2018A	2019A	2020E	2021E	2022E	2023E	2024E	2025E	2026E
Profit for the year	685	965	894	683	700	771	1,196	1,483	1,683	2,003	2,460	2,717
Adjustments for non-cash transactions	603	1,086	845	716	831	803	626	747	879	1,007	1,179	1,386
Interest received	14	25	17	13	27	16	0	0	0	0	0	0
Interest paid	-43	-71	-33	-27	-47	-40	0	0	0	0	0	0
Income tax paid	-184	-212	-262	-195	-251	-219	0	0	0	0	0	0
<b>Cash flow from operating activities before change in NWC</b>	<b>1,075</b>	<b>1,793</b>	<b>1,461</b>	<b>1,190</b>	<b>1,260</b>	<b>1,331</b>	<b>1,823</b>	<b>2,230</b>	<b>2,562</b>	<b>3,011</b>	<b>3,640</b>	<b>4,104</b>
Change in NWC	397	388	164	-169	-437	-588	-509	-124	-175	-81	-275	-111
<b>Cash flow from operating activities</b>	<b>1,472</b>	<b>2,181</b>	<b>1,625</b>	<b>1,021</b>	<b>823</b>	<b>743</b>	<b>1,314</b>	<b>2,106</b>	<b>2,387</b>	<b>2,930</b>	<b>3,364</b>	<b>3,992</b>
Purchase of intangible assets	-148	-202	-223	-295	-325	-309	-288	-311	-329	-358	-405	-461
Purchase of PPE	-220	-287	-268	-312	-451	-379	-1,355	-1,287	-1,558	-1,527	-1,885	-2,266
Disposal of PPE	1	21	8	8	4	1	0	0	0	0	0	0
Disposal of non-current assets	-3	0	99	0	0		0	0	0	0	0	0
Disposal of other financial assets	0	0	0	0	2		0	0	0	0	0	0
Proceeds from investment in JV	0	0	0	10	52	32	0	0	0	0	0	0
Net Other investments							-15	-16	-18	-19	-21	-24
Additions of shares in JV	0	-66	-15	-14	-11	-4	0	0	0	0	0	0
<b>Cash flow from investing activities before acquisition of subsidiaries and financial investments</b>	<b>-370</b>	<b>-534</b>	<b>-399</b>	<b>-603</b>	<b>-729</b>	<b>-659</b>	<b>-1,657</b>	<b>-1,615</b>	<b>-1,904</b>	<b>-1,905</b>	<b>-2,311</b>	<b>-2,750</b>
Acquisition of subsidiaries, net of cash	-55	-83	0	-65	-3	218	0	0	0	0	0	0
Net financial investments	0	0	-8	-422	-303		0	0	0	0	0	0
Disposal of financial investments	0	0	0	0	544	174	0	0	0	0	0	0
Purchase of marketable securities	0	-200	0				0	0	0	0	0	0
<b>Cash flow from investing activities</b>	<b>-425</b>	<b>-817</b>	<b>-407</b>	<b>-1,090</b>	<b>-491</b>	<b>-267</b>	<b>-1,657</b>	<b>-1,615</b>	<b>-1,904</b>	<b>-1,905</b>	<b>-2,311</b>	<b>-2,750</b>
<b>Free cash flow</b>	<b>1,047</b>	<b>1,364</b>	<b>1,218</b>	<b>-69</b>	<b>332</b>	<b>476</b>	<b>352</b>	<b>1,303</b>	<b>1,422</b>	<b>2,087</b>	<b>2,280</b>	<b>2,681</b>
Acquisition of treasury shares	-176	-417	-697	-402	-201	0	0	0	0	0	0	0
Disposal of treasury shares	40	11	1	0	0	0	0	0	0	0	0	0
Dividends paid	-116	-201	-278	-250	-197	-209	-386	-598	-742	-842	-1,002	-1,230
Payment of lease liabilities	0	0	0	0	-61	-82						
Proceeds from borrowings	496	0	0	0	100	94	183	218	260	310	370	441
Proceeds from other liabilities							-140	50	41	57	86	55
Payment of financial debt	-604	-4	0	0	-8	-37	0	0	0	0	0	0
Transactions with non-controlling interest	0	0	0	13	0		0	0	0	0	0	0
<b>Cash flow from financing activities</b>	<b>-360</b>	<b>-611</b>	<b>-974</b>	<b>-639</b>	<b>-367</b>	<b>-234</b>	<b>-342</b>	<b>-330</b>	<b>-441</b>	<b>-475</b>	<b>-546</b>	<b>-734</b>
<b>Net increase in cash and cash equivalents</b>	<b>687</b>	<b>753</b>	<b>244</b>	<b>-708</b>	<b>-35</b>	<b>242</b>	<b>-686</b>	<b>161</b>	<b>42</b>	<b>550</b>	<b>507</b>	<b>509</b>
Cash and cash equivalents as at 1 January	2,014	2,765	3,550	3,653	2,918	2,888	3,063	2,377	2,538	2,580	3,130	3,638
Exchange rate adjustments on cash and cash equivalents	64	32	-141	-27	5	0	0	0	0	0	0	0
<b>Cash and cash equivalents as at 31 December</b>	<b>2,765</b>	<b>3,550</b>	<b>3,653</b>	<b>2,918</b>	<b>2,888</b>	<b>3,063</b>	<b>2,377</b>	<b>2,538</b>	<b>2,580</b>	<b>3,130</b>	<b>3,638</b>	<b>4,146</b>

Source: Company Data, Team Analysis

## Appendix F1 - Discounted Cash Flow Model

Discounted Cash Flow (mEUR)	2015A	2016A	2017A	2018A	2019A	2020E	2021E	2022E	2023E	2024E	2025E	2026E
<b>Revenue</b>	<b>8,423</b>	<b>10,237</b>	<b>9,953</b>	<b>10,134</b>	<b>12,147</b>	<b>14,819</b>	<b>16,977</b>	<b>18,363</b>	<b>19,381</b>	<b>21,122</b>	<b>23,874</b>	<b>27,158</b>
Growth Rate %	0	22%	-3%	2%	20%	22%	15%	8%	6%	9%	13%	14%
Revenue, Onshore	7,285	8,928	8,431	8,465	10,276	12,764	12,948	13,278	13,820	14,838	15,833	16,907
Revenue, Offshore	668	141	1,151	945	1,435	1,379	1,634	2,303	2,368	2,665	3,723	5,004
Revenue, Service	1,138	1,309	1,522	1,669	1,871	2,055	2,395	2,782	3,193	3,618	4,319	5,247
Growth rate service %		15%	16%	10%	12%	10%	17%	16%	15%	13%	19%	21%
<b>COGS</b>	<b>-6,918</b>	<b>-8,111</b>	<b>-7,990</b>	<b>-8,503</b>	<b>-10,386</b>	<b>-13,281</b>	<b>-14,838</b>	<b>-15,862</b>	<b>-16,551</b>	<b>-17,827</b>	<b>-19,911</b>	<b>-22,650</b>
COGS %	-82%	-79%	-80%	-84%	-86%	90%	-87%	-86%	-85%	-84%	-83%	-83%
<b>Gross Profit</b>	<b>1,505</b>	<b>2,126</b>	<b>1,963</b>	<b>1,631</b>	<b>1,761</b>	<b>1,538</b>	<b>2,139</b>	<b>2,501</b>	<b>2,830</b>	<b>3,295</b>	<b>3,963</b>	<b>4,508</b>
Gross Margin %	18%	21%	20%	16%	14%	10%	13%	14%	15%	16%	17%	17%
OPEX	-247	-300	-312	-252	-211	-156	-262	-193	-200	-208	-217	-225
<b>EBITDA</b>	<b>1,258</b>	<b>1,826</b>	<b>1,651</b>	<b>1,379</b>	<b>1,550</b>	<b>1,382</b>	<b>1,877</b>	<b>2,308</b>	<b>2,629</b>	<b>3,087</b>	<b>3,746</b>	<b>4,283</b>
Amortization	-171	-162	-155	-180	-212	-246	-272	-294	-310	-338	-382	-435
Depreciation	-178	-215	-243	-246	-334	-384	-355	-453	-569	-670	-797	-952
Impairments	-3	-28	-23	-32	0	-54	0	0	0	0	0	0
<b>EBIT</b>	<b>906</b>	<b>1,421</b>	<b>1,230</b>	<b>921</b>	<b>1,004</b>	<b>698</b>	<b>1,250</b>	<b>1,562</b>	<b>1,750</b>	<b>2,079</b>	<b>2,567</b>	<b>2,897</b>
EBIT Margin %	11%	14%	12%	9%	8%	5%	7%	9%	9%	10%	11%	11%
Net Financials	19	-134	-38	-11	-95	236	283	340	408	489	587	587
<b>EBT</b>	<b>925</b>	<b>1,287</b>	<b>1,192</b>	<b>910</b>	<b>909</b>	<b>934</b>	<b>1,534</b>	<b>1,902</b>	<b>2,158</b>	<b>2,568</b>	<b>3,154</b>	<b>3,484</b>
Income tax expense	-240	-322	-298	-227	-209	-163	-337	-418	-475	-565	-694	-766
<b>Net Profit</b>	<b>685</b>	<b>965</b>	<b>894</b>	<b>683</b>	<b>700</b>	<b>771</b>	<b>1,196</b>	<b>1,483</b>	<b>1,683</b>	<b>2,003</b>	<b>2,460</b>	<b>2,717</b>
Net financial expenses	-29	-46	-16	-14	-20	-27	-32	-38	-46	-55	-66	-66
<b>NOPLAT</b>	<b>726</b>	<b>1,416</b>	<b>1,063</b>	<b>764</b>	<b>714</b>	<b>701</b>	<b>1,234</b>	<b>1,515</b>	<b>1,707</b>	<b>2,018</b>	<b>2,464</b>	<b>2,721</b>
Depreciation and Amortization	349	377	398	426	546	630	626	747	879	1,007	1,179	1,386
Changes in NWC	397	388	164	-169	-437	-588	-509	-124	-175	-81	-275	-111
Capex	-425	-817	-407	-1,090	-491	-267	-1,000	-834	-989	-858	-1,088	-1,314
<b>Free Cash Flows</b>	<b>1,047</b>	<b>1,364</b>	<b>1,218</b>	<b>-69</b>	<b>332</b>	<b>476</b>	<b>352</b>	<b>1,303</b>	<b>1,422</b>	<b>2,087</b>	<b>2,280</b>	<b>2,681</b>
PV FCF							330	1,144	1,170	1,609	1,647	1,815

### Terminal Value Using Perpetual Growth Model

Terminal Cash Flow, mEUR	2,681
WACC	6,72%
Terminal Growth Rate	2,5%
<b>Terminal Value , mEUR</b>	<b>54,030</b>

### Exit multiple

The terminal value of EUR 54.03bn gives an implied EV/EBITDA multiple of 12.38x.

### Target Price

Cumulative PV of FCF, mEUR	7,716
PV of Terminal Value, mEUR	36,572
% of Enterprise Value	83%
<b>Enterprise Value, mEUR</b>	<b>44,288</b>
Implied Equity Value	39,871
Shares Outstanding	202m
Implied Share Price, EUR	197
<b>Implied Share Price, DKK</b>	<b>1480</b>

Source: Company Data, Team Analysis

## Appendix F2 - WACC Computation

### WACC Calculation

Inputs	Value
Risk free rate	1,87%
Equity risk premium (Denmark)	4,72%
Cost of debt	4,27%
Tax rate	22%
After-tax cost of debt	3,33%
Beta	1,14
Target market D/E	10%
Cost of equity	7,06%
Debt/Value	9,09%
Equity/Value	90,91%
<b>WACC</b>	<b>6,72%</b>

### Risk Free Rate Computation

Region	Average Country-Weighted Risk Free Rate	Revenue %
EMEA	1.0%	41.9%
Americas	2.4%	45.1%
APAC	3.1%	13.0%
<b>Combined risk free rate</b>		<b>1.87%</b>

### Levered beta

Company Name	Levered Beta	Unlevered Beta
Vestas	1,05	1,1
Siemens Gamesa RE	0,7	0,71
Goldwind	1,25	0,88
Nordex	1,51	1,39
GE	1,23	1,2
Average		1,06
Tax Rate		22%
Target Debt Level		10%
<b>Levered Beta</b>		<b>1,14</b>

Source: Team Analysis

**Cost of debt:** We revenue-weight 10 year government bond yields from all countries above 1% of Vestas' revenue to arrive at 3 regional risk free averages for EMEA, Americas and APAC. We then revenue-weight the average risk free rate for each region, yielding a combined risk free rate of 1.87%. By adding Vestas' debt implied corporate spread to the risk free rate and subtracting taxes, we arrive at an after-tax cost of debt of 3.33%. We believe this cost of debt accurately represents the long-run interest rate environment we expect to materialize.

**Cost of equity:** We further re-lever the beta of near peers to compute Vestas' levered beta of 1.14. Using the CAPM formula, equity risk premium for Denmark and a long-term target market D/E of 10% we calculated the cost of equity to be 7.06%.

**WACC:** This gives an overall WACC of 6.72% for Vestas.



## Appendix F3 - Sensitivity analysis

We conduct a sensitivity analysis to evaluate the significance of changes in key inputs on our valuation. We find that a significant decline of 15% in both the MW delivered and the average selling price would result in a downgrade of our recommendation. Nonetheless, we believe those scenarios are highly unlikely given Vestas' strict pricing track record along with an ever-growing order backlog. In a similar fashion, a 1% decline in the terminal value could cause a shift in our recommendation. However, we believe that as an already established leader with industry leading technology, Vestas will grow faster than the economy and will be a key piece of the renewable transition, capturing majority of international climate commitments. Hence, any terminal value below 1.5% is contrary to our expectations. Flexing the COGS/revenue ratio by +2%/-2% does not have an impact on our valuation.

		Terminal Growth Rate				
		1.5%	2.0%	2.5%	3.0%	3.5%
WACC	5.7%	1571	1764	2017	2363	2865
	6.2%	1377	1525	1713	1959	2295
	6.7%	1220	1337	1480	1663	1902
	7.2%	1091	1185	1298	1438	1615
	7.7%	983	1059	1150	1260	1396

		COGS/REV				
		-2%	-1%	0%	1%	2%
WACC	5.7%	2324	2171	2017	1863	1710
	6.2%	1979	1846	1713	1580	1447
	6.7%	1715	1597	1480	1363	1246
	7.2%	1507	1402	1298	1193	1089
	7.7%	1339	1244	1150	1055	961

		MW Delivered				
		-15%	-10%	0%	10%	15%
WACC	5.7%	1681	1793	2017	2241	2354
	6.2%	1422	1519	1713	1906	2003
	6.7%	1225	1310	1480	1650	1735
	7.2%	1071	1146	1298	1449	1525
	7.7%	945	1013	1150	1286	1355

		Average Selling Price				
		-15%	-10%	0%	10%	15%
WACC	5.7%	1674	1788	2017	2246	2360
	6.2%	1417	1515	1713	1910	2009
	6.7%	1220	1307	1480	1654	1740
	7.2%	1066	1143	1298	1452	1529
	7.7%	941	1011	1150	1289	1359

Source: Team Analysis

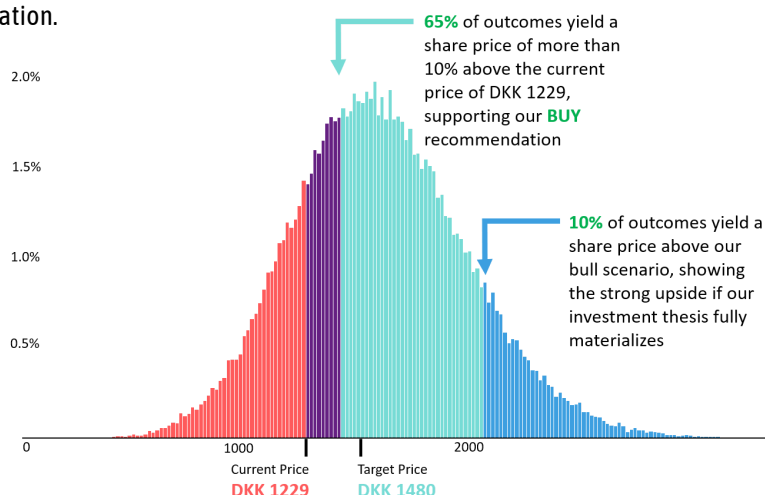
## Appendix F4 - Monte Carlo Simulation

To assess how Vestas' stock price would be affected by uncertainty, we perform a Monte Carlo simulation. In the simulation, we stress the following parameters:

- 1) WACC
- 2) Terminal growth rate
- 3) Regional onshore MW delivered (EMEA, Americas, China and APAC exl. China)
- 4) Regional offshore MW delivered (EMEA, Americas, China and APAC exl. China)
- 5) Average selling price (onshore, offshore and service)
- 6) COGS

The mean and standard deviation for these parameters are based on historical values and our own analysis of Vestas. We performed 100 000 iterations.

**Results:** We observe that **65%** of all outcomes yield a share price more than 10% above the current price, cementing our **BUY** recommendation. Only 17% of the scenarios lead to a sell recommendation.



Source: Team Analysis

### SIMULATION STATISTICS

Trials	100 000
Target Price	DKK 1480
25th percentile	DKK 1323
Mean	DKK 1483
Mean upside %	21%
Median	DKK 1488
75th percentile	DKK 1694
Standard deviation	274
Coefficient of Variation	0.18
Skewness	0.43
Kurtosis	3.42
% above 10% upside	65%
% bull scenario	10%

## Appendix F5 - Relative valuation

The peers shown in the tables below are categorized based on industry. Each peer company included has similar business characteristics and risk exposure as Vestas.

**Non-Chinese Wind Peers:** This peer group includes wind OEMs which mainly operate outside China. The majority of peers operate with a three-legged revenue base consisting of onshore, offshore and service. These companies are well-established and represent the top onshore wind manufacturers in terms of revenue (excluding Chinese OEMs). Vestas should trade at a higher multiple than its peers in the non-Chinese wind market due to their technological moat and superior service segment.

**Chinese Wind Peers:** Although Vestas has a limited presence in the Chinese wind market, it is still important to compare Vestas to a peer group of Chinese competitors given the size and growth of this geographic market. Compared to its western peers, Chinese wind OEMs generally have a smaller market capitalization given their localized presence. There are economic and political frictions involved in a western turbine OEM, like Vestas, from entering the Chinese wind market including intellectual property protection rights and preferential economic policies favoring Chinese wind OEMs. These factors create a high barrier to entry in the Chinese market, but also restrict Chinese turbine OEMs from entering western markets. Since the combined North American and European wind markets, are larger than the Chinese wind market, we believe that Vestas should trade at a higher multiple than its Chinese peers.

**Solar power manufacturers peers:** Solar power is the only renewable source of energy that can compete with wind power in terms of LCOE. We argue that wind power peers should trade at a higher multiple because: 1) wind power has a higher capacity factor than solar, 2) wind can generate more electricity per surface area than solar, and 3) offshore wind enjoys greater expansion opportunities than solar. Given these characteristic advantages, we believe that wind deserves a premium over solar.

**Green technology peers:** This peer group contains companies whose core business model is reducing carbon emissions through groundbreaking technological innovations. These companies invest much of their profits back into the company to fuel growth and continued advancement. Additionally, this peer group uses a good portion of their annual budget towards R&D and technology capital expenditures. We believe Vestas should trade slightly below the green technology peer group since Vestas is a blend of a pure technology company and a heavy manufacturer.

Non-Chinese Wind Peers	Mkt Cap (EURm)	EV (EURm)	EV/EBITDA			EV/EBIT			Price/Earnings			EV/Net Sales			EV/Sales		
			2019	2020	2021e	2019	2020	2021e	2019	2020	2021e	2019	2020	2021e	2019	2020e	2021e
SIEMENS GAMESA RENEWA	22 948	23 395	8,2	24,1	24,4	15,4	50,4	50,3	60,4	83,5	83,2	0,6	N/A	0,8	N/A	2,2	2,1
General Electric Company	84 837	61 288	13,3	9,5	10,1	21,0	25,0	25,3	N/A	43,2	44,4	N/A	0,0	0,1	N/A	0,9	0,8
Nordex	2 962	3 200	9,09	35,5	36,2	76,1	N/A	50,9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0,7	0,7
NEXTERA ENERGY PARTNEF	134 393	179 745	21,78	19,0	19,0	53,8	31,1	31,0	N/A	33,4	33,2	N/A	N/A	0,58	N/A	10,5	9,8
<b>Average</b>			13,1	22,0	<b>22,4</b>	41,6	35,5	<b>39,4</b>	60,4	53,4	<b>53,6</b>	0,6	0,0	<b>0,5</b>		3,6	<b>3,3</b>
<b>Median</b>			13,1	22,0	<b>22,4</b>	41,6	33,3	<b>39,4</b>	60,4	48,3	<b>49,0</b>	0,6	0,0	<b>0,5</b>		2,2	<b>2,1</b>

Chinese Wind peers	Mkt Cap (EURm)	EV (EURm)	EV/EBITDA			EV/EBIT			Price/Earnings			EV/Net Sales			EV/Sales		
			2019	2020e	2021e	2019	2020e	2021e	2019	2020e	2021e	2019	2020e	2021e	2019	2020e	2021e
Xinjiang Goldwind Science &	8 116	11 684	18,8	14,6	16,3	36,5	18,4	18,6	23,3	17,7	19,5	-0,6	0,5	0,5	N/A	1,6	1,7
Titan Wind Energy (Suzhou)	1 702	2 346	11,9	10,6	10,6	15,6	16,4	15,2	15,1	12,5	12,6	0,3	0,4	0,4	N/A	2,4	2,1
MING YANG SMART ENERG	4 706	4 744	N/A	18,3	11,4	N/A	20,7	10,2	N/A	24,0	15,5	0,0	3,9	2,6	N/A	1,7	1,3
<b>Average</b>			15,4	14,5	<b>12,8</b>	26,1	18,5	<b>14,7</b>	19,2	18,1	<b>15,9</b>	-0,1	1,6	<b>1,1</b>		1,9	<b>1,7</b>
<b>Median</b>			15,4	14,6	<b>11,4</b>	26,1	18,4	<b>15,2</b>	19,2	17,7	<b>15,5</b>	0,0	0,5	<b>0,5</b>		1,7	<b>1,7</b>

Solarpower manufacturer   peers	Mkt Cap (EURm)	EV (EURm)	EV/EBITDA			EV/EBIT			Price/Earnings			EV/Net Sales			EV/Sales		
			2019	2020e	2021e	2019	2020e	2021e	2019	2020e	2021e	2019	2020e	2021e	2019	2020e	2021e
Jinkosolar Holding Co Ltd	2 522	5 276	8,6	14,4	14,8	13,0	22,2	22,5	7,38	20,4	20,9	0,07	1,9	1,7	N/A	1,2	1,0
Canadian Solar Inc	1 170	2 764	7,4	15,5	12,8	12,0	27,9	26,0	7,78	34,7	28,8	N/A	N/A	N/A	-0,3	N/A	N/A
First Solar Inc	5 264	3 754	10,3	15,5	13,0	20,9	24,8	19,9	N/A	25,5	26,8	N/A	0,4	0,4	1,4	N/A	N/A
Motech Industries Inc	294	313	7,2	N/A	N/A	N/A	61,7	24,8	N/A	49,4	49,4	1,16	1,1	0,8	N/A	2,9	3,1
<b>Average</b>			8,4	15,1	<b>13,5</b>	15,3	34,1	<b>23,3</b>	7,6	32,5	<b>31,5</b>	0,6	1,1	<b>1,0</b>	0,5	2,1	<b>2,1</b>
<b>Median</b>			8,0	15,5	<b>13,0</b>	13,0	26,3	<b>23,6</b>	7,6	30,1	<b>27,8</b>	0,6	1,1	<b>0,8</b>	0,5	2,1	<b>2,1</b>

Green technology peers	Mkt Cap (EURm)	EV (EURm)	EV/EBITDA			EV/EBIT			Price/Earnings			EV/Net Sales			EV/Sales		
			2019	2020e	2021e	2019	2020e	2021e	2019	2020e	2021e	2019	2020e	2021e	2019	2020e	2021e
Siemens AG	84 381	102 924	13,8	17,4	15,5	16,0	33,5	24,6	17,2	23,6	14,4	-1,1	-4,4	0,4	N/A	N/A	N/A
WEG S.A.	27 955	27 788	32,3	56,2	57,7	37,6	66,2	67,9	44,7	76,7	78,7	2,17	13,5	11,4	N/A	10,2	8,8
Trane Technologies Plc	29 684	31 668	4,7	17,6	17,4	13,7	20,5	20,3	18,4	28,7	28,0	4,76	N/A	N/A	N/A	2,9	2,7
Tesla	646 173	642 529	38,6	96,2	92,9	264,8	157,5	153,0	N/A	215,8	206,7	N/A	N/A	0	N/A	16,5	12,4
<b>Average</b>			22,3	46,9	<b>45,9</b>	83,0	69,4	<b>66,5</b>	26,8	86,2	<b>82,0</b>	1,9	4,5	<b>3,9</b>		9,9	<b>8,0</b>
<b>Median</b>			23,0	36,9	<b>37,6</b>	26,8	49,8	<b>46,2</b>	18,4	52,7	<b>53,4</b>	2,2	4,5	<b>0,4</b>		10,2	<b>8,8</b>

Relative Valuation	EV/EBITDA	EV/EBIT	Price/Earnings
Vestas Multiple 2021	24	37	34
Metric 2021	1 877	1 250	1 196
EV * Multiple	45 048	46 250	
Market cap	40 579	41 781	40 664
Share Price 2021	1 507	1 551	1 510

The multiples are calculated as the metric of 2021 multiplied with the estimated multiple we have assigned Vestas. In order to find the market cap for EV/EBITDA and EV/EBIT we subtract net debt from the estimated enterprise value and divide it with the number of outstanding shares.

Source: Company Data, Bloomberg, Team Analysis