May 2017

WELLINGTON MANAGEMENT®

Charging toward a lower-carbon economy

Alan Hsu
Portfolio Manager and
Global Industry Analyst

Alan manages our Global Environmental Opportunities approach. As a global industry analyst, he conducts fundamental analysis and research on the utilities and renewable energy/clean technology sectors, and is a member of the Utilities/Energy team.

KEY POINTS

- Favorable economics, including falling costs and rising industry employment figures, support renewables.
- Political dynamics in the US and elsewhere have also become supportive of long-term growth.
- Widespread social concern from consumers, companies, governments, and institutional investors is another tailwind.
- Challenges remain, but we believe that sustainable industries are here to stay, with long runways for growth ahead.

DESPITE NEGATIVE RHETORIC FROM THE TRUMP ADMINISTRATION AND THE RECENT REPEAL OF THE US CLEAN POWER PLAN, we strongly believe that companies focused on sustainability and renewable energy will continue to thrive. Increasingly favorable economics and global support from consumers, governments, companies, and large investors create tailwinds for long-term growth and value creation.

Favorable economics and political support

Powerful drivers behind sustainable industries include global declining costs and job creation potential, and, in the US, increasing bipartisan political support.

According to the International Renewable Energy Agency (IRENA), by 2025, the global average-weighted levelized cost of energy (LCOE)[1] of solar photovoltaics (PV) could fall by 59%, and onshore and offshore wind could see declines of 26% and 35%, respectively (FIGURE 1). In the US, solar- and wind-power prices already compete with fossil fuels without the backing of government subsidies.

FIGURE 1
Levelized costs of energy are falling

	Global weighted average (US dollar/kWh)		Percent change
	2015	**2025**	
Solar PV	0.13	0.06	-59%
Onshore wind	0.07	0.05	-26%
Offshore wind	0.18	0.12	-35%

Source: International Renewable Energy Agency (IRENA)

[1]Levelized cost of energy (LCOE) is defined as the expected lifetime, fully amortized cost of electricity supply. It is used to compare the cost of different sources of electricity.

In the US, increasing support from voters and politicians in traditionally fossil-fuel-producing states has changed the equation.

While cost competitiveness can vary significantly by geographic location, prevailing electricity prices, and existence of local subsidies (solar and wind are more competitive in comparatively sunny or windy places, for example), overall, we are seeing rapid global adoption. The International Energy Agency (IEA) says that renewables displaced coal as the largest source of installed capacity in the world in 2015. Notably, in the US, installed solar capacity outpaced gas-based capacity in 2016. Wind and solar are attracting a higher share of investment and funding in new projects, thanks to the declining cost curve.

IRENA also reports that 8.1 million people worldwide worked in the renewable energy industry in 2016, a 5% increase year over year. The industry group expects this figure to increase to 24 million by 2030.[2] These rising numbers stand in contrast to traditional energy, which has been marked by declining employment figures in recent years. In the US, renewable energy jobs rose by 6% in 2016, while those in the oil and gas sector dropped by 18%. In China, more people work in renewable energy today than in traditional oil and gas.[3]

In the US, increasing support from voters and politicians in traditionally fossil-fuel-producing states has changed the equation. Wind and solar are now important sources of state revenue, cost savings, and job growth in the Midwest and South. Conservative, rural constituencies have increasingly embraced the benefits of personal choice and savings that renewables offer. Recently, many Republican governors and congressional representatives have opposed cuts to federal credits and subsidies for wind and solar.

Secular tailwinds

Social concerns about a cleaner, more sustainable future are another tailwind. Consumers, governments, companies, and major market movers — including large institutional investors such as pension funds, insurers, sovereign wealth funds, foundations, and endowments — continue to drive change. The financial benefits of shifting to renewable sources of energy and deploying sustainable technology are meaningful factors as well.

US consumers are expressing the value they place on a lower-carbon future with their wallets. US residential and industrial consumers installed 14,762 megawatts direct current (MWdc) of solar PV capacity in 2016, a nearly 100% increase over the prior year. Utilities were by far the largest growth driver in this segment, installing more PV in 2016 than the entire market did in 2015.[4]

Governments around the world are playing a major role as well. The base of support is broad, supported by distinct drivers across major geographies:

- In Europe, Climate Action 2020, the European Union's (EU's) climate and energy package, has set ambitious targets for the end of the decade, including cutting greenhouse gasses by 20%, generating 20% of all EU energy from renewables, and improving energy efficiency by 20%.
- China, whose cities are choking on polluted air, has agreed to greater transparency in reporting emissions levels, and has pledged to establish a national emissions trade-off plan this year. In addition, President Xi Jinping recently outlined a buildout of renewable energy capacity.

[2] "Renewable Energy and Jobs: Annual Review 2016," IRENA, May 2016.

[3] Ibid.

[4] "Solar Market Insight 2016 Year in Review," Solar Energy Industries Association, 2016.

For their part, companies have begun to embrace renewable energy as a means to decarbonize their energy supply and gain electricity-cost certainty.

- The government of Japan has taken a number of steps to adhere to the United Nations Sustainable Development Goals (UN SDG), including Affordable and Clean Energy. These commitments, including the US signing of the Paris Agreement (climate accord), are not easily undone.
- In India, rapid energy demand growth has prompted a greater focus on renewables. The country's budget for fiscal 2015 – 2016 included plans for a six-fold increase in solar and wind capacity by 2022.[5] The Indian government is predicting that 43% of India's electricity capacity will come from non-fossil-fuel sources by 2027, exceeding the Paris climate accord target of 40% by 2030.[6]

For their part, companies have begun to embrace renewable energy as a means to decarbonize their energy supply and gain electricity cost certainty. The rising trend of corporate support has been most noticeable among technology enterprises with heavy data-center loads. For them, renewables are an economic way to diversify the energy fuel supply, as well as an opportunity to make a positive environmental impact.

Finally, the efforts of institutional investors are material. The independent Asset Owners Disclosure Project (AODP) rates big investors on their success at managing climate risk within their portfolios. Their data shows that investors are taking climate risk more seriously, turning ideas into action. The 31 highest-rated institutional investors — those that earned AODP's best marks for climate-change mitigation efforts — "have outperformed the benchmark return over five years, demonstrating that climate risk can be managed without sacrificing returns."[7] These investors have over US$2.5 trillion in assets under management (AUM). Meanwhile, the number of institutional investors with low grades on climate change has shrunk in number and AUM.

Challenges and the importance of diversification

In the US, concerns about the effect of tax reform, including the potential repeal or decreased use of tax credits and subsidies for production and investment in renewable energy have created a headwind for these industries. We believe this situation is temporary, however, and that the many fundamental and economic drivers will more than offset tax impacts in the long run. The lingering uncertainties around tax policy are an important reminder that diversifying exposure to sustainable industries and developing technology that drives a lower-carbon future are critical.

Solar and wind are a subset of a much broader universe of companies that are leading the transformation to a low-carbon economy. Some of the investment ideas we seek include:

- Utilities with significant renewables capacity
- Industrial companies that develop or implement smart meters for better resource efficiency
- Technology companies working on developing and enhancing connectivity for the Internet of Things (IoT) to enable energy and water efficiency
- Enterprises that manufacture software and sensors for electric vehicles

[5] Shrimali, Gireesh, et al. "Reaching India's Renewable Energy Targets Cost Effectively," Climate Policy Initiative, April 2015.

[6] Draft National Energy Plan from the Government of India (Central Electricity Authority), December 2016.

[7] "World's Biggest Investors Step Up Action to Protect Millions of Pensions from Climate Risk," Asset Owners Disclosure Project, May 2016.

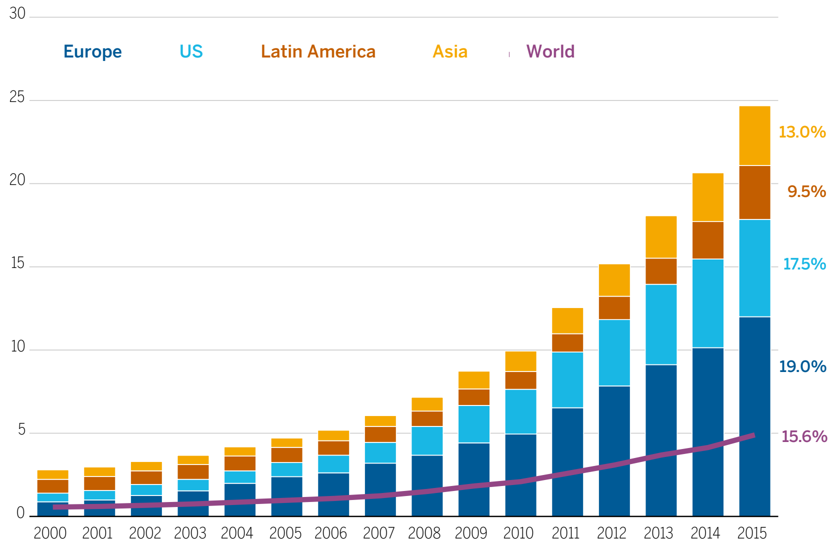
Renewable energy is here to stay

With costs falling, adoption rates rising, and job growth expanding, we believe the era of renewable energy and sustainability is here to stay. **Figure 2** shows the growth in wind and solar energy production in various global regions, and worldwide. That share has more than doubled over the last four years, and shows no sign of slowing.

Figure 2

Share of wind and solar in electricity production

Year-over-year growth, 2000 to 2015 (%)



Source: Enerdata

The economics of sustainable energy are becoming more competitive with carbon-based sources, and increasingly entrenched secular tailwinds are in place. In the US, bipartisan political support is facilitating adoption of renewables at the state level, and consumers and companies across the country are saving money with sustainable technology. Governments, including in the US, have enacted policies that incentivize climate change mitigation, and so far 60 countries are signatories of the COP21's climate change accord. Finally, many of the world's largest investors, including public pension plans and sovereign wealth funds, are instituting portfolio policy goals aimed at tackling climate change. We believe that the progression toward a lower-carbon world that is already underway is part of a global transformation that is too powerful for any politician or policymaker, anywhere, to stop.

WELLINGTON MANAGEMENT COMPANY LLP Boston | Chicago | Radnor, PA | San Francisco
WELLINGTON MANAGEMENT AUSTRALIA PTY LTD Sydney
WELLINGTON MANAGEMENT CANADA LLC Serviced from Boston and Chicago
WELLINGTON MANAGEMENT HONG KONG LTD Hong Kong | Beijing Representative Office
WELLINGTON MANAGEMENT INTERNATIONAL LTD London | Frankfurt
WELLINGTON MANAGEMENT JAPAN PTE LTD Tokyo
WELLINGTON MANAGEMENT SINGAPORE PTE LTD Singapore
WELLINGTON MANAGEMENT SWITZERLAND GmbH Zurich
WELLINGTON LUXEMBOURG S.à r.l. Luxembourg

www.wellington.com

 453854_4