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INDEPENDENT EQUITY RESEARCH

Doral Energy – Update Report

18.06.2023

Doral presents good growth in Q1 2023 with 35% increase in revenues from sale of electricity, coupled with 32% growth in aggregate EBIDTA and 34% growth in FFO. Driven by high demands for electricity from renewable sources, significant construction momentum in Israel and the US with a significant backlog of projects, and a tailwind of favorable taxation regulations in the US. As a leader in green electricity supply in the Israeli market, Doral will start selling large volumes of green electricity and certificates to contracted consumers in 2024; In our estimation, 2024 will be a turning point in Doral's revenues with entry of new profitable projects alongside growth in revenues from DoralTech; price target is unchanged.

Stock Exchange
TASE

Symbol
DORL

Sector
Technology

Sub-sector
Renewable Energy

Stock price target
NIS 24.5

Closing price
NIS 7.5

Market cap
NIS 1.34 Bn

No. of shares
177.7 Mn

Average Daily Trading Volume
NIS 2.2 Mn

Stock Performance (Since Jan. 2023)
-9.54%

Doral presents further growth in its operations alongside revenue growth of approx. NIS 25.4M (approx. NIS 15.8 million non-GAAP) and increased its portfolio to approx. 18.9 GW (DC) and approx. 13.4 GWh, including approx. 2.86 GW (DC) and 2.26 GWh of mature projects (projects that are yielding and ready for connection, under construction or nearing construction and/or after winning competitive procedures or signing a PPA). In the US, Doral demonstrated accelerated progress in photovoltaic and storage projects, including the construction of the first part of the Mammoth North project (480 MWp) in Indiana. The company signed agreements for the sale of electricity for each Indiana project (approx. 1,560 MWp) for 15 years and received building permits for the entire Indiana project. In Israel, Doral is building solar projects combined with storage and has already commercially operated the first project of this type. The company operates in a variety of technologies, including solar, solar + storage, Agrivoltaics, stand-alone storage, and biogas.

As one of the dominant players in Israel, Doral enjoys advantages of scale in procurement and access to various technologies that can serve it in the future. Against this backdrop, the company established Doral Tech to invest in start-ups developing synergistic technologies for Doral's activities, similar to the activity of other energy companies in the US market.

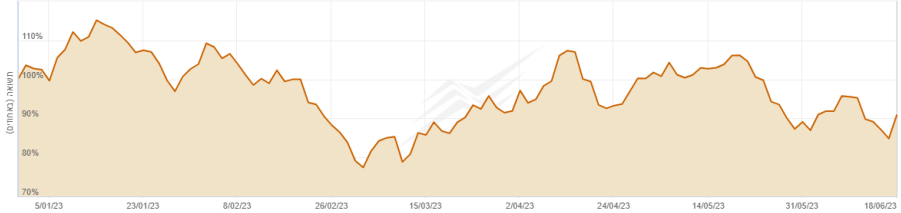
Other significant events in Q1 2023:

- Signed an agreement for the sale of green electricity and green certificates to Melisron for a period of 10 years for approx. NIS 500 million. The company also signed agreements for the sale of green electricity to ICL for a period of 15 years and in the amount of approx. NIS 360 million and to Migdal Insurance for a period of 10 years in the amount of approx. NIS 220 million.
- Signed a precedential financial closure for the financing of solar projects combined with storage, with Mizrahi Bank and other institutional entities in the amount of over NIS 1 billion. The company foresees this agreement as a crucial foundation for securing financing for further solar and storage projects under new Electricity Authority regulations, allowing electricity sales on the free market (Virtual PPAs).

We will remind that the global growth potential is far from saturated. Renewable energy investments peaked at $350 billion in 2020, with solar and wind power accounting for $290 billion of the total. In addition, we see a tailwind for renewable energies in the US by the huge plans of the Biden administration with a cumulative scope of approx. $3 trillion. We anticipate significant growth in the company's activity in 2023, we are updating the economic model based on the company's progress in the various projects. In our assessment, the price target is unchanged.

Attached on the next page is a breakdown of key events in recent months.

Year	Revenues* (M NIS)	EBITDA* (M NIS)
2021A	72	64
2022A	109	89
2023E	165	134



*Annual revenues/EBITDA from projects (representing 100% ownership in the projects), excluding management fees and other corporate-level revenues.

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Key events in Q1 2023 and in recent months:

- On April 4, 2023, upon receipt of the required approvals, a corporation wholly owned by the company entered into an agreement with a consortium of lenders led by Bank Mizrahi-Tefahot Ltd. and other institutional entities, in an agreement to finance senior debt in the amount of NIS 575 million, for a cluster of solar projects combined storage, whose construction cost is estimated at NIS 675 million.
- On March 31, Doral Natural Energy Ltd., a company fully owned by the company, which holds an electricity supply license, entered into an agreement with ICL Group Ltd., which owns and operates, among other things, many industrial areas throughout the country that consume significant amounts of electricity, In the agreement for the sale of green electricity. As part of the agreement, ICL undertook to purchase from the company, starting on January 1, 2024 and for a period of 15 years, electricity in the amount estimated at about 75 million kWh per year and for a total of about NIS 360 million for the entire period.
    - The agreement with ICL promotes and strengthens the company's activity in the field of electricity supply and the supply of "green" electricity to business consumers in the Israeli economy, and also creates diversification in the assets to which the company is expected to supply electricity, which at the time of this report includes commercial properties, office buildings, industrial properties and other properties.
- On March 22, Doral Renewable Energy signed an agreement with Migdal Insurance Company Ltd. for the sale of electricity, green electricity and green certificates. According to the agreement, Migdal will purchase electricity and green certificates from the company, starting on June 1, 2024, for an estimated amount of approximately 50 million kWh per year, for a total amount of approximately NIS 220 million for the entire 10-year period.
- On March 13, the company purchased 100% of the interests of Great Bend Solar, LLC, which owns a photovoltaic project under development in Ohio, USA, with a capacity of approximately 48 MW. In accordance with the purchase agreement, the company paid $5.4 million, entered as an asset under construction. The purchase agreement also contains an additional payment of $1.3 million contingent upon the achievement of certain project milestones, none of which have been achieved as of the date of this report.
- On February 23, Doral Electricity signed an agreement with Melisron, one of the leading and largest real estate companies in Israel, for the sale of green electricity and certificates. Melisron committed to purchase electricity in an estimated amount of NIS 500 million for the entire 10-year period, with the price attributed to the component Production is determined by the Electricity Authority. The company will associate some of the electricity meters at Melisron sites with its own photovoltaic production facilities that produce green electricity.

Q1 2023 financial overview (non-GAAP data):

- In Q1 2023, the company's revenues from electricity sales grew, when electricity sales increased by 45% to 13.5 million NIS and total revenues decreased by 19% to approximately 15.7 million NIS.
- This growth comes with a substantial increase in certain expenses, such as the cost of redemption to NIS 6.6 million (about 43% growth) and sales, marketing and promotion expenses to NIS 7.8 million (about 274% growth).
    - Despite these challenges, the company managed to achieve growth in total net profit including non-GAAP items, reaching NIS 22.1 million, mainly due to a decrease in expenses. This highlights the need for the company to continue focusing on cost management and financial strategies to maintain profitability and ensure success long term.

Executive Summary

Investment Thesis

The global growth of the renewable energy sector can be attributed to the efforts of governments and organizations to reduce dependence on polluting fuels and greenhouse gas emissions. In order to meet renewable energy targets set forth in the Paris 2015 agreement, governments have been taking decisive actions, implementing policies, regulations, and licensing processes for companies that construct renewable energy facilities that generate electricity in a reliable, safe, and economical manner for many years.

Doral is well respected in its industry, both locally and globally. Its reputation extends across the Renewable Energy value and supply chains, as well as within its specific business ecosystem. The company has successful experience across all steps and stages of renewable energy projects, including initiation, development, financing, construction, management, operation, ownership, and sale of assets.

The company aims to continue creating value by utilizing its land reserves and expertise in working with landowners in Israel and internationally. Their strategy involves targeting markets that meet specific criteria with a specific emphasis on supportive policies and regulations, favorable natural resources, an opportunity to optimize the development, and market size that supports future growth. In international markets the company partners with local entities that provide advantages in the initial early stages of development.

For the foreseeable future, Doral's main markets are Israel, the US, and Europe. It has the necessary expertise, financial resources, and know-how to advance its projects, but the challenge lies in successfully transforming pipeline projects into operational grid-connected facilities within a period of 1-5 years. To quantify this uncertainty, we use probabilities in our economic model.

Doral's value proposition to investors, partners, and suppliers include:

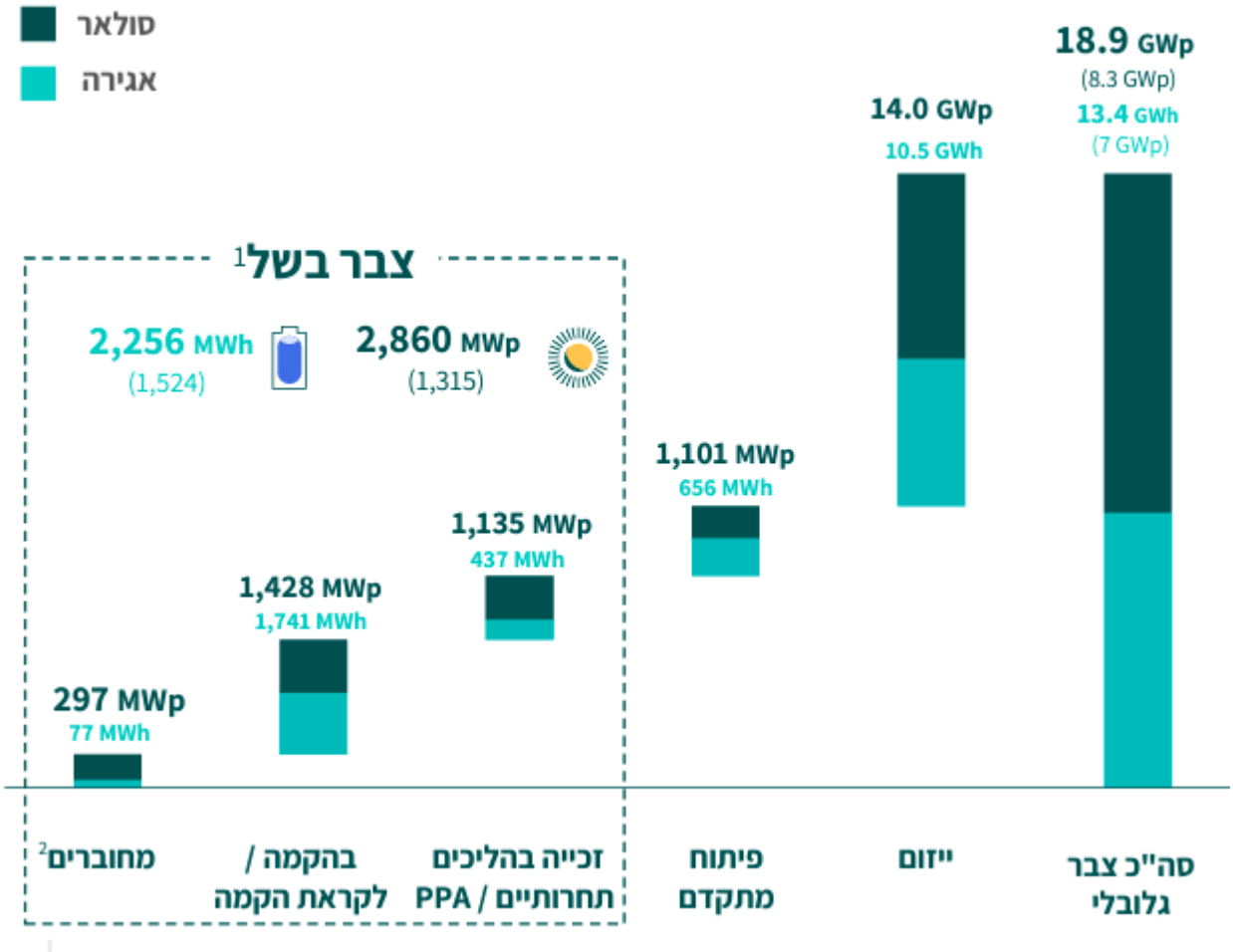
- Creating larger profit margins due to exceptional accessibility to land in Israel, Europe, and the United States and optimizing the development processes.
- Focus on markets that are mature or maturing in terms of renewable energy policies and regulation, and such markets where renewable energy sources provide competitive electricity prices without the need for subsidies.
- Focusing on markets with mature or maturing renewable energy policies and regulation, and such markets where renewable energy sources provide competitive electricity prices without the need for subsidies.
- Size advantage in the purchase of equipment for projects, financing of projects, and contracts with entities to sell electricity.
- High probability of obtaining financing due to positive reputation and established industry relationships.
- Identifying opportunities, creativity, innovation, and daring.

We forecast that Doral's projects' (representing 100% holdings in projects assuming a full year of operation) will generate revenues of NIS 177 million by the end of 2023.

Company Overview

Doral Renewable Energy Group (TASE: DORL) initiates, develops, establishes, and operates renewable energy projects throughout Israel, the USA and Europe. The company's vision is to implement its renewable energy projects on a global scale. The company has projects with a capacity of approx. 18.9 GW that are in various stages of operation, construction, development, and initiation. At the beginning of 2022, the company presented an updated forecast for 2025, when as of the date of publication of the reports the general portfolio goal it had set for itself had already been achieved today. Doral believes in the application of innovative technologies and is active in various areas of renewable energy, including integration of solar energy and energy storage Doral is the big winner in the first and second competitive procedure for the construction of solar facilities that integrate energy storage, with the total portfolio including approximately 13.4 GWh of energy storage facilities.

Project pipeline overview:



(Source: Doral's presentation for the Q1 2023 financial report)

The Company has five main divisions of activity:

1. **The Israel Division**, a leader in the solar + storage energy market, owns a green electricity supplier, is dominant in terms of the company's portfolio.
2. **American division**, which owns one of the largest solar projects in the US, located in Indiana with a capacity of approx. 1.6 GW (DC) and large solar projects combined with storage capacity.
3. **European division**, holding joint ventures with local entrepreneurs in Italy, Poland, Romania, and Denmark are expected to continue and expand the company's portfolio significantly.
4. **The Doral-Tech division**, which is the innovation division, invests in synergistic technological ventures for the company's activities that are in various stages of growth.
5. **Environmental Infrastructure Division** operates in the fields of biogas, waste management and wastewater treatment.

To support these divisions Doral's strategic strengths include:

1. Experienced staff with extensive experience and professional knowledge.
2. Ability to navigate the regulatory requirements.
3. Work with first-class technological equipment manufacturers.
4. Established relationships with banks and institutional investors for financing.
5. Partnership agreements with about 230 kibbutzim throughout Israel for the benefit of establishing energy production systems.

These strengths make up Doral's competitive value proposition, and result in long-term partnerships.

Israel Activity

In 2008, Doral was the first company to connect a photovoltaic system to the national electricity grid in Israel, and in December 2022 the company commercially operated the first solar + storage of its kind in Israel, with a capacity of approx. 5.5 MW (DC) and approx. 12 MWh of storage, which will enable the supply of renewable energy to the electricity grid even beyond the conventional production hours of solar installations. The company leads the energy storage market and engages in advanced projects that combine electricity production from solar energy with energy storage. The company has large Israeli projects nearing construction, which are the product of the first and second competitive procedures that combine facilities for generating electricity from solar energy with energy storage. As of today, Doral has a yield or maturity in Israel of renewable energy facilities with a capacity of approx. 2.9 GW (DC) and approx. 2.3 GWh of energy storage, including over 545 yielding solar systems in Israel, which it initiated and developed itself, including on the ground, on reservoirs and ponds, and on roofs. The company has built photovoltaic systems of various scales, including both large infrastructure projects as well as small systems intended for self-consumption. In addition, the company recently received a license to supply electricity and began selling electricity to end consumers and even issuing green certificates.

מימון בסך של כמיליארד ₪ לפרויקטי סולאר ואגירה בישראל

קונסורציום מלווים בהובלת בנק מזרחי וגופים מוסדיים

- חוב בכיר בסך **כ-575 מיליון ₪**
- מסגרות נוספות בסך **כ-475 מיליון ₪**
- בסיס משמעותי למימון פרויקטי אסדרת השוק

ממשיכים בתנופת ההקמות

כ-1.4 GWp + כ-1.7 GWh בהקמה ולקראת בהקמה

- **כ-1.5 מיליארד ₪** כבר הושקעו בפרויקטים אלו

מובילי שוק באספקת חשמל ירוק

התקשרויות נוספות למכירת חשמל ירוק ותעודות ירוקות

- מכירת מאות מיליוני קוט"ש כבר ב-2024
- לקוחות מובילים במשק הישראלי
- הבטחת תעריפים גבוהים למתקני הייצור של החברה

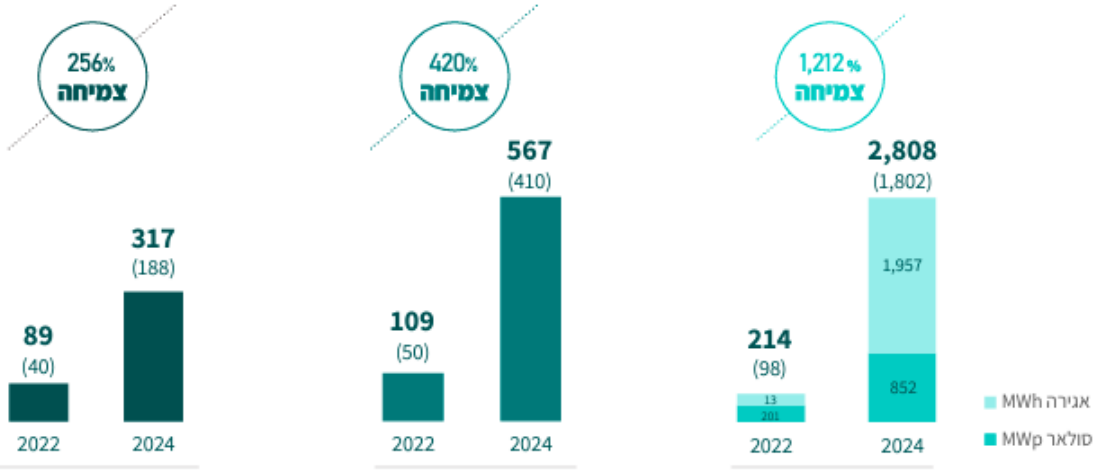
צמיחה בתוצאות הפרויקטים ברבעון[4]

גידול בכל הפרמטרים ביחס ל-Q1 2022

- **35%** גידול בהכנסות
- **32%** גידול ב-EBITDA
- **33%** גידול ב-FFO

Among other projects, the company owns the "Hadrei Sha'an" project alongside 11 partnering kibbutzim from Emek Beit She'an - one of the largest renewable energy projects in the Middle East, located in the Beit She'an Valley.

Tenders that combine electricity production from solar energy with energy storage facilities - Doral is a major player in the energy storage market in Israel and won 300 MW (AC) out of 777 MW (AC) allocated by the Electricity Authority as part of competitive procedures 1+2 for photovoltaic facilities that include energy storage. The company reported that some of the projects that won competitive procedures will be converted to market regulation, and in total the projects are expected to bring in approx. NIS 271 million per year, EBITDA of approx. NIS 233 million, and FFO of approx. NIS 190 million. Doral owns an estimated 62% of the chain (weighted average) of these projects.



* הנתונים בסוגריים משקפים את צפי חלקה של החברה בפרויקטים (בשרשור)

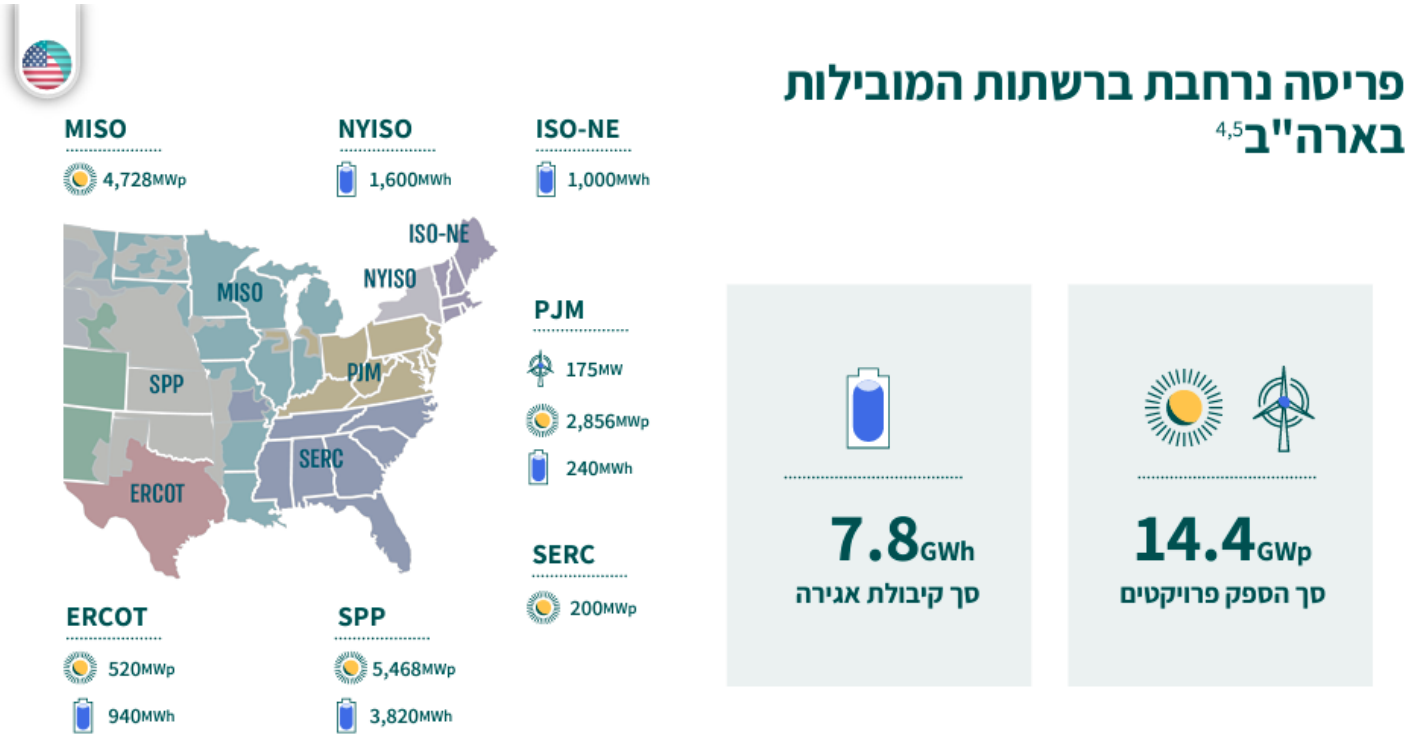
** החל משנת 2024, הנתונים כוללים הן את הכנסות תאגידי הפרויקטים הרלוונטיים ממכירת חשמל למספק החשמל של החברה, והן את הכנסות המספק ממכירת חשמל זה ללקוחות קצה

US Activity

Doral operates in the US through Doral LLC, a corporation held 41.78% by Doral USA, 20% by a corporation owned by Migdal Insurance Company Ltd. and 38.22% by Clean Air Generation LLC, A local partner, with connections, organizational and managerial ability, and extensive experience in the field of renewable energy in the US. Doral LLC is involved in the initiation, management, development and construction of renewable energy facilities in the US, including solar facilities combined with energy storage and stand-alone storage facilities, and also owns a wind energy project. The company's activities are carried out in various markets, including PJM, MISO, and SPP (in several countries), with a total volume of approx. 14.4 GW (DC) and a storage capacity of approx. 7.8 GW/h, in various stages of development.

Doral's giant project in Indiana, Mammoth Solar, entered its construction phase in 2022, and its first part (480 MWp) is expected to be connected and commercially operated in 2024. The company announced the completion of the sale of electricity for each Indiana project in the amount of approx. 1.6 GW for 15 years, and for issuing building permits for the entire project. The total expected revenues from the sale of electricity for all the agreements signed in the US is approx. USD 1.5 billion, alongside additional merchant revenues in significant volumes. The Mammoth Solar project in Indiana covers an area of approx. 50,000 dunams (the same size as the municipal area of Tel Aviv-Jaffa) and the total supply is estimated at approx. 1,600 MW (DC), with the remaining two parts of the project expected to be commercially commissioned in 2024.

This is a significant milestone for the company, which proves the company's ability to execute on the development of its project backlog.



In August 2022, President Biden signed the Reduction Inflation Act, which will allocate approximately USD 370 Billion to the fight against climate change. The legislation, in its current form, includes the following sections (in summary) relevant to the renewable energy market:

(1) Extending the ITC (Investment Tax Credit) benefit by 10 years and increasing the tax credit threshold for all investments in solar facilities to 30% for projects that begin construction until 2032, to 26% for projects that will begin construction in 2033 and to 22% for projects that will begin construction in 2034.

(2) An additional 10% tax credit for projects included in the "Energy Community" track subject to certain conditions, including the establishment of a project on land considered damaged or contaminated or the establishment of a project in an area defined as an unemployment area, where employment was based on coal/natural gas energy production facilities or an area located near a closed coal mine/coal station. Also, an additional 10% tax credit for projects, subject to certain conditions, among them, the rate of use of raw materials produced in the USA in the project.

(3) the extension of the PTC (Production Tax Credit) benefit, which allows receiving tax credits according to energy production from “Green” sources", for a period of 10 years, and the opening of the possibility of receiving this benefit for solar projects.

(4) The eligibility for tax benefits also applies to stand-alone energy storage facilities (Stand Alone Storage).

(5) Easements in the equity tax investment plan, including the possibility For the sale of most benefits and tax credits to other companies without the need for the complex sales structure that exists in tax partner agreements, the possibility of selling parts of the tax benefits and splitting the sale over several years, as well as extending the periods for receiving tax refunds - up to 3 years back and up to 22 years forward (one year has passed back and 20 years ahead as of today).

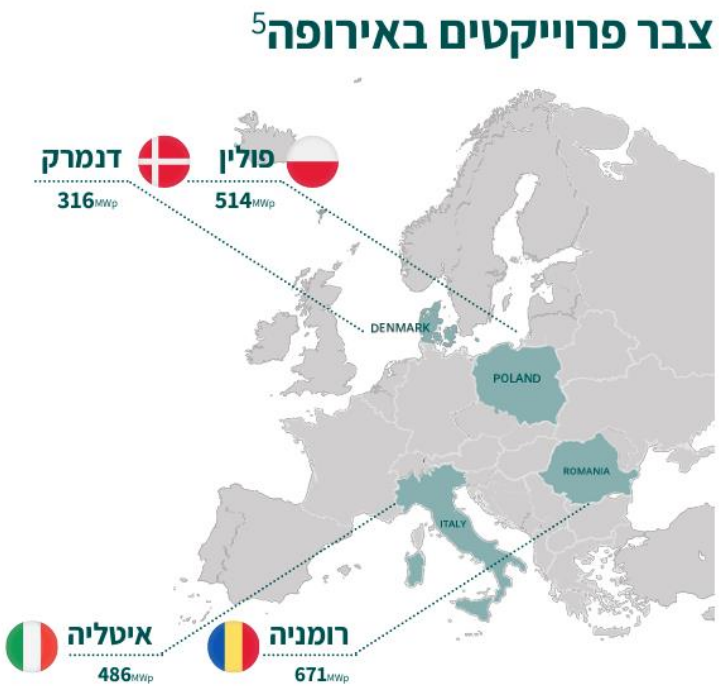
(6) The regulation and tax benefits for storage facilities and green hydrogen facilities. In this context, the Indiana North project, which began construction in 2022, will work to receive a maximum tax credit of 30%, subject to the consent of the tax partner and lenders. Also, in the company's estimation, the legislation will have a materially positive effect on all of Doral's backlog of projects in the US. In addition, Doral has begun the process of Projects in the backlog that it promotes, which may meet the criteria for receiving an additional tax credit of 10%, below is the list of the relevant projects:

Project	Solar MWp	Storage MWh
Mammoth South	360	
Mammoth Central I	360	
Mammoth Central II	360	
Goonies	233	
Other Projects - PJM	100	
Other Projects - MISO	984	
Other Projects - SPP	1,020	900
Total	**3,417**	**900**

European Activity

The company operates through partnerships with local third parties for the purposes of locating, developing, promoting, setting up and operating photovoltaic systems in the countries of Poland, Italy, Romania, and Denmark.

As of the date of the report, the company had accumulated projects in Europe with a total capacity of approx. 1,888 MW (DC), of which approx. 964 are in initiation stages, approx. 772 are in advanced development, approx. 137 are under construction/toward construction, and approx. 16 are connected and/or ready to be connected. In addition, the company continues the momentum of initiation in Europe. [Please update the slide from the latest deck we published]



Doral Tech

Doral Tech, a subsidiary of the Doral Group, was established in 2020 with the aim of identifying and investing in innovative green technology start-ups that provide solutions to significant energy and climate challenges, aligning with Doral's core activities. Based in Ramat Gan, Israel, Doral Tech combines analysis, engineering, and science teams to perform due diligence and develop solutions in renewable energy and environmental infrastructure through collaboration with academia and industry.

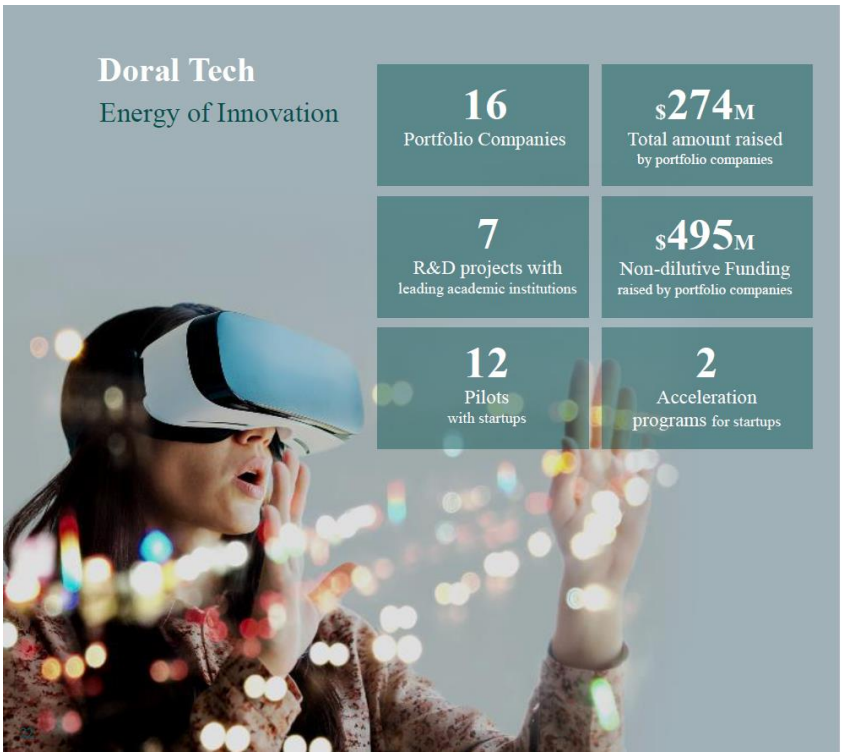
One of the company's main focuses is investing in and promoting energy storage solutions critical to the stability and growth of the renewable energy industry. Doral Tech invests in and develops various energy storage technologies, such as advanced battery systems, such as a sodium-ion battery system in a joint project

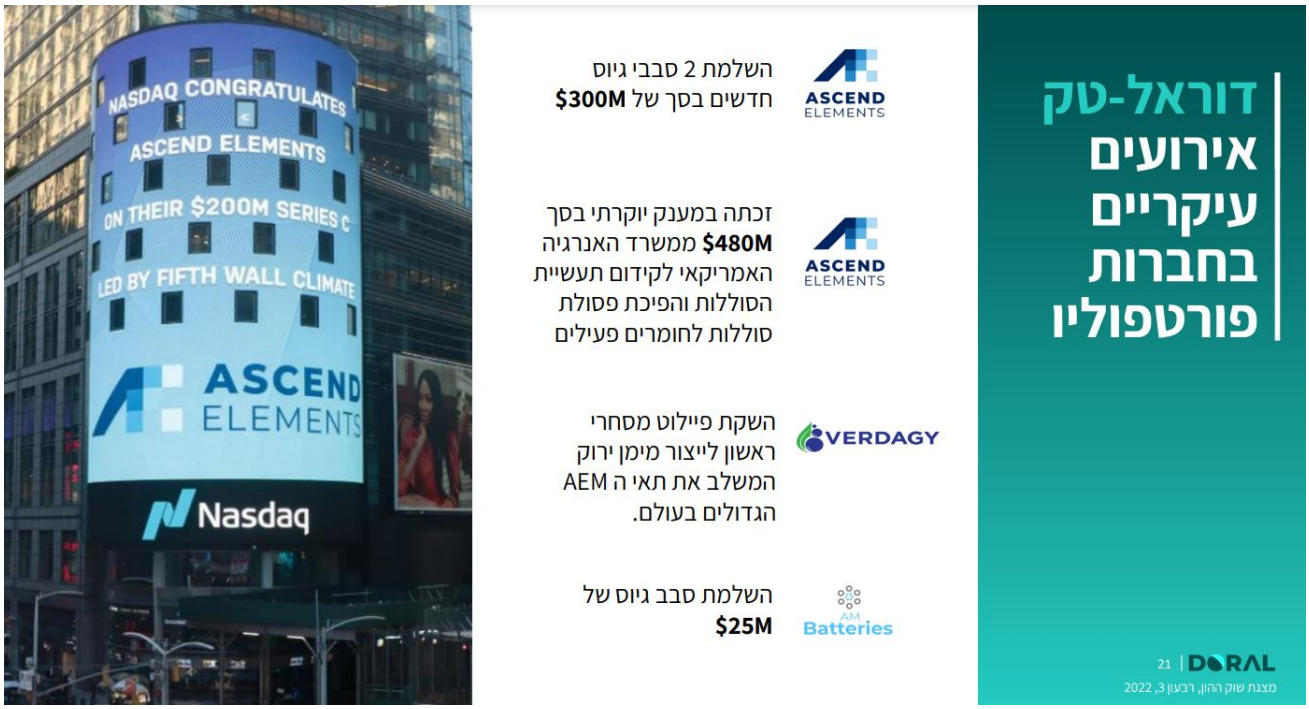
with Bar-Ilan University. The company also invests in other energy storage solutions, such as flow battery systems that offer long-term energy storage benefits.

To support the growth and development of target companies, Doral Tech provides capital, management resources, infrastructure, technological capabilities, academic collaborations, marketing, and business development assistance. Its investment portfolio includes green energy solutions, lithium battery recycling, waste-to-energy systems, integrated energy storage systems, and battery diagnostics, control, and optimization.

As of Q1 2023, Doral Tech had invested in 16 portfolio companies, amounting to approx. NIS 94 million out of a framework of NIS 100 million approved by the company's board of directors in a wide range of companies focused on renewable energy, environmental infrastructure, and sustainability. These investments include Phinergy (green energy solutions), Ascend Elements (lithium battery recycling and production of raw materials for the battery industry), Zohar Cleantech (waste-to-energy systems), Yotta Energy (integrated energy storage systems with converters and charging stations for electric vehicles), H2PRO (green hydrogen electrolysis technology), Noon Energy (long-term energy storage), and others.

In our view, Doral's investment in innovative technologies may significantly increase its value in the future (due to portfolio company appreciation and creating a significant advantage in competition) and also assist in technology integration and synergies in its core activities.





Below we will introduce the global renewables market in detail and focus heavily on solar energy because the lion's share of Doral's activities is within this domain. We will further specifically detail the US market and give a comprehensive overview of the Israeli renewables ecosystem to give readers a solid understanding of Doral's landscape.

Global Renewable Market Introduction

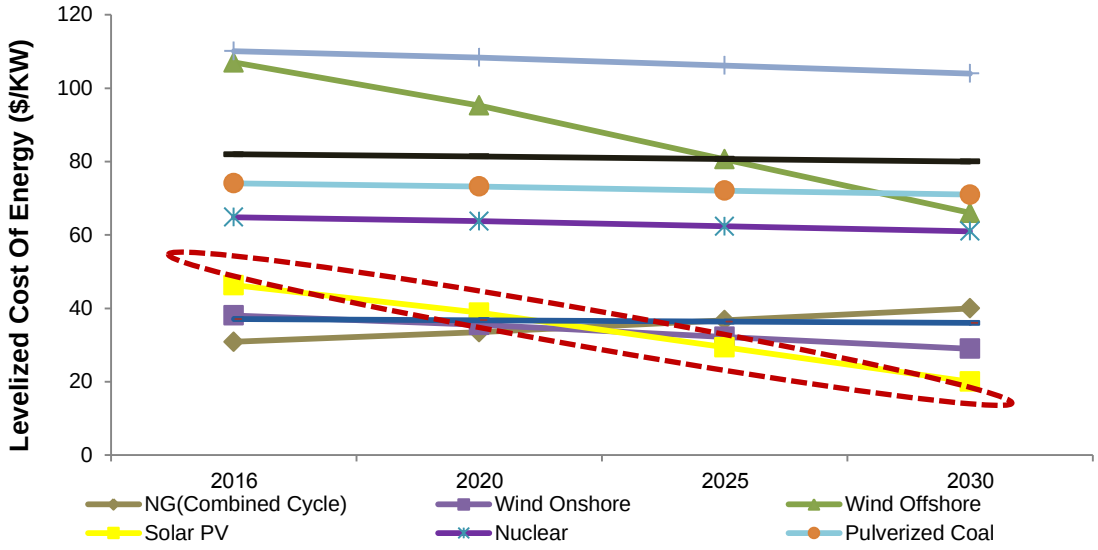
Historically, the global power generation market was dominated by centralized energy sources such as coal, nuclear, oil, and large hydropower plants, which were usually state-owned and transmitted electricity across a centralized grid with minimal competition within the market. The environmental impact was hardly considered. However, this situation has gradually changed over the past two decades, mainly driven by market decentralization, favorable regulatory frameworks that boosted competition, concerns over the impact of climate change, and supportive renewable incentive programs.

Renewable energy is a rapidly growing market that offers a clean and sustainable alternative to traditional energy sources. One of the main drivers of growth in the renewable energy market is the increasing demand for clean energy as individuals and businesses become more aware of the environmental impact of traditional energy sources. The demand for renewable energy is driven by concerns over climate change, air pollution, and other environmental issues. According to the International Energy Agency, renewable energy is expected to account for 80% of the growth in global electricity generation by 2030. The market has seen significant growth over the past few years, driven by several key factors.

Another important factor contributing to the growth of the renewable energy market is government support. Many governments around the world have introduced policies and incentives to encourage the development of renewable energy infrastructure. These policies include feed-in tariffs, tax credits, and renewable energy targets. For example, in the United States, the Production Tax Credit provides a tax credit of 1.5 cents per kilowatt-hour for wind projects' first 10 years of operation. Similarly, the Investment Tax Credit provides a tax credit of 26% of the total cost of a solar project. These policies have helped make renewable energy more financially viable and attractive to investors, contributing to the growth of the renewable energy market.

Lastly and most importantly, the declining costs of renewable energy technologies have contributed significantly to the growth of the renewable energy market. Specifically, solar and wind power costs have dropped significantly in recent years, making them more competitive than traditional energy sources. According to the International Renewable Energy Agency (IRENA), solar photovoltaic (PV) module costs have decreased by 90% since 2010, and onshore wind power costs have decreased by 70%. The decline in renewable energy project costs started around 2010, with solar PV leading the way. Solar module costs have decreased by around 82% over the decade (modules account for between 35% and 45% of total project costs). Although wind technology cost declines started later, they have also been substantial, with the global average price per MW for onshore wind declining by 39% and offshore wind by 29% between 2010 and 2019.

Continued cost reductions are expected for both wind and solar through a combination of lower core technology costs, such as larger turbines and taller hub heights, a reduction in total project costs through greater efficiencies in construction and commissioning, and lower servicing costs. This has led to more businesses and individuals investing in renewable energy as a cost-effective and sustainable alternative.



The renewable energy market can be broadly divided into several categories, including: wind, solar, hydro, geothermal, and biomass. There are additional categories, such as Nuclear, that will not be included in this overview. Solar and wind power are the most widely adopted renewable energy sources, accounting for a large portion of the global renewable market.

Solar energy is produced by using solar panels to convert sunlight into electricity. The solar panel market is dominated by China, which accounts for more than 70% of global solar panel production. The United States, India, and Japan are major solar energy markets. According to IRENA, the global installed solar energy capacity was 843 GW in 2021, up from just 40 GW in 2010.

Wind energy is produced by using wind turbines to generate electricity. China, the United States, and Germany dominate the global wind energy market. According to IRENA, the global installed capacity of wind energy was 824 GW in 2021, up from just 198 GW in 2010.

Hydroelectric power is produced by using the energy of falling water to generate electricity. China, Brazil, and Canada dominate the global hydroelectric power market. According to IRENA, the global installed capacity of hydroelectric power was 1,360 GW in 2021, up from 957 GW in 2010.

Geothermal energy is produced by tapping into the earth's heat to generate electricity. The United States, Indonesia, and the Philippines dominate the global geothermal energy market. According to IRENA, the global installed capacity of geothermal energy was 16 GW in 2021, up from just 10 GW in 2010.

Biomass energy is produced using organic matter such as wood or agricultural waste to generate electricity. Europe and North America dominate the global biomass energy market. According to IRENA, the global installed capacity of biomass energy was 143 GW in 2021, up from just 54 GW in 2010.

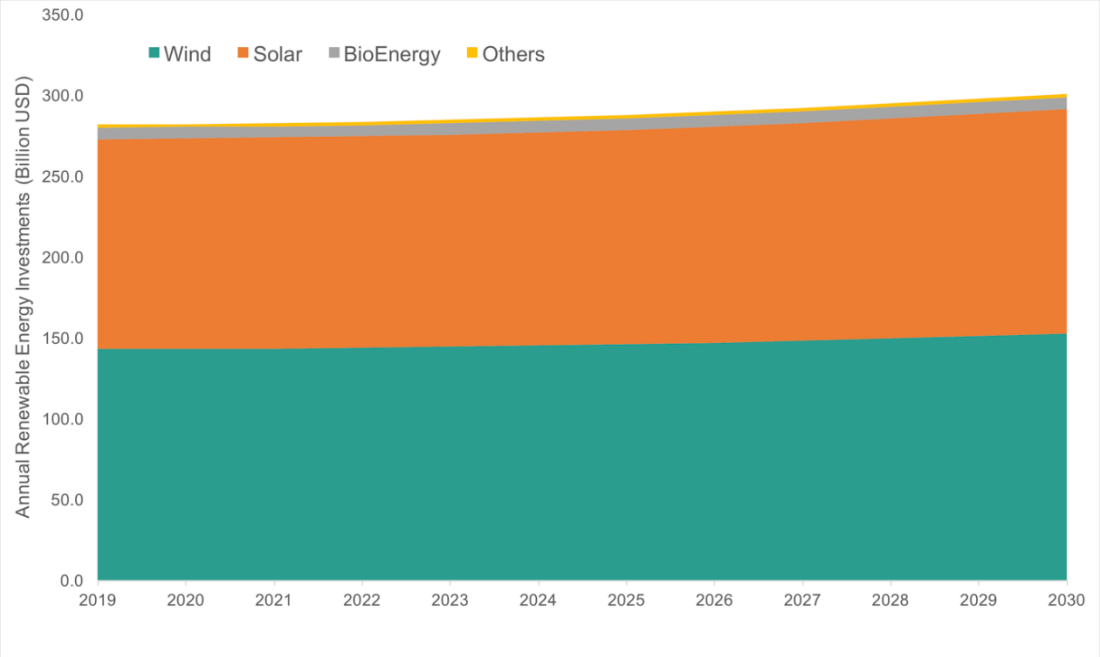
Regarding regional market trends, Asia Pacific is the largest market for renewable energy, with countries such as China and India leading the way in adopting and developing renewable energy technologies. According to the International Energy Agency, Asia is expected to account for two-thirds of the growth in global energy

demand by 2040, which is driving the adoption of renewable energy in the region. China is the world's largest solar panel and wind turbine market and has set a target to reach carbon neutrality by 2060.

Europe and North America also have a significant presence in the renewable energy market, with countries such as Germany, the United States, and Canada investing heavily in renewable energy infrastructure. In Europe, the European Union has set a target to reach carbon neutrality by 2050, driving investments in renewable energy. In the United States, the Biden administration has set a target of achieving a carbon-free power sector by 2035, driving the adoption of renewable energy in the country.

Wind power and solar PV dominate global renewable investment (large hydropower, which is still a significant technology in a number of markets, is not considered truly renewable because of the potential environmental damage to the river networks). Global investments in renewable energies accounted for $282 Billion in 2019, with wind and solar energies accounting for ~97% of non-hydro renewable investment in 2019. A total of ~$3 trillion is projected to be invested across the next decade in renewable energy sources, with annual renewable energy investment exceeding ~$300 Billion in 2030. Further cost reductions mean that both technologies will reach grid parity (a situation where it is as cheap to build a solar plant than a coal plant) in an increasing number of markets over the coming decade, further supporting the business case for investing in renewables.

Figure: Annual Global Investments in Renewable Energies (Billion USD)



Global Photovoltaic Industry

The photovoltaic (PV) industry is one of the fastest-growing industries in the world. This report provides an overview of the global PV market, including its history, technology, market size, and future prospects.

The basic technology behind PV cells involves converting sunlight into electricity. PV cells are made of semiconductor materials, typically silicon, which are treated to create a p-n junction. When sunlight hits the PV cell, it excites the electrons in the semiconductor, creating an electrical current. This current can be harnessed and used to power homes, businesses, and other applications.

The PV industry has seen significant advancements in technology over the years, with improvements in cell efficiency, module design, and system integration. In recent years, there has been a focus on developing new materials and manufacturing processes to further increase efficiency and decrease costs.

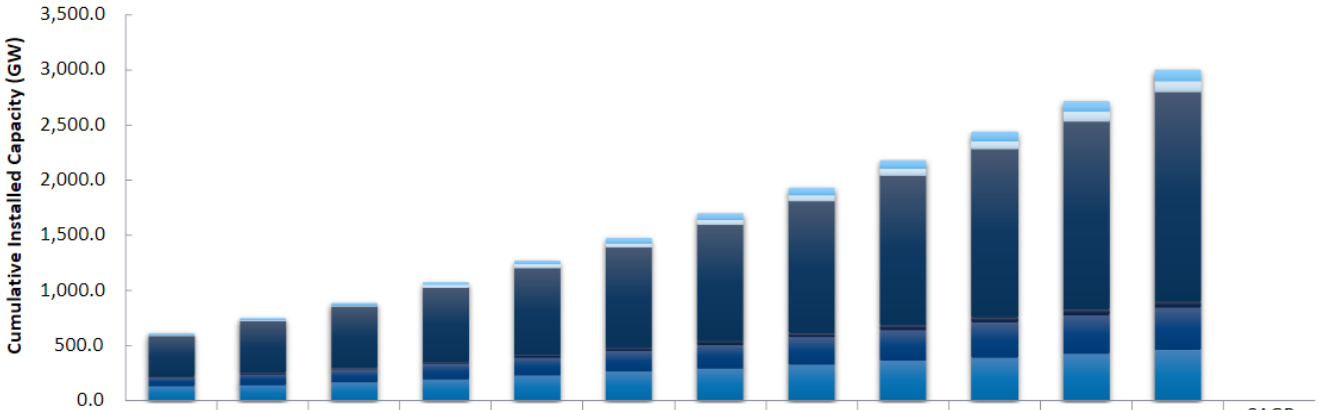
The global PV market has experienced significant growth in recent years, driven by factors such as decreasing costs, supportive government policies, and increasing demand for renewable energy. According to the International Energy Agency (IEA), the world's total installed PV capacity was 773.4 GW as of the end of 2020, up from 645.8 GW in 2019. China is the largest market for PV, with 253 GW of installed capacity, followed by the United States with 97.7 GW and Japan with 72 GW.

New installations in the global PV market reached 127 GW in 2020, a 22% increase from 2019. China led the way in new installations, adding 48.2 GW of PV capacity in 2020. Other countries that showed significant growth in PV installations include the United States, which added 19.2 GW, and Vietnam, which added 11.6 GW.

Investment in the PV industry also continued to grow in 2020. According to BloombergNEF, global investment in solar PV reached $148.6 billion in 2020, up by 12% from 2019. This investment was spread across a range of areas, including new PV installations, research and development, and mergers and acquisitions.

The future of the PV industry looks bright, with continued growth expected in the coming years. Frost & Sullivan projects that PV capacity will reach nearly 3,000 GW by 2030, which would represent a significant share of the world's electricity generation capacity.

Solar OV Market: Cumulative Installed Capacity Forecast by Region, Global, 2019 – 2030



	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	CAGR (21-30)
Africa	10.64	11.27	13.25	23.35	32.35	41.35	50.35	59.35	68.47	77.69	86.94	96.19	24.6%
ME	9.78	12.67	15.30	22.44	30.09	38.74	46.92	56.46	66.36	76.21	86.06	95.96	22.6%
APAC	366.74	465.02	554.99	669.83	788.15	912.16	1,050.74	1,198.80	1,358.29	1,527.04	1,706.98	1,898.58	14.6%
LATAM	8.50	12.68	16.77	20.87	24.57	28.27	31.96	36.46	41.13	45.99	50.99	55.99	14.3%
North America	79.99	97.19	114.14	135.39	160.64	185.89	213.39	244.72	278.58	312.95	347.85	383.27	14.4%
Europe	137.48	149.56	170.64	202.10	234.95	267.81	300.66	333.52	366.37	399.23	432.48	465.57	11.8%

One of the key drivers of growth in the PV industry is decreasing costs. According to the International Renewable Energy Agency (IRENA), the average cost of PV electricity has fallen by 89% between 2010 and 2020. This has made PV increasingly competitive with fossil fuels, making it more attractive for businesses and households.

Another driver of growth is supportive government policies. Many countries have introduced policies such as feed-in tariffs, tax credits, and renewable portfolio standards to encourage the development of renewable energy, including PV. In addition, the COVID-19 pandemic has led many countries to increase their support for renewable energy as part of their economic recovery plans.

In addition, there is growing interest in emerging technologies such as perovskite solar cells, which have the potential to further increase efficiency and reduce costs. These new technologies are still in the early stages of development but have the potential to transform the PV industry in the coming years.

Israel Renewables Ecosystem

The renewable energy ecosystem in Israel has been rapidly evolving in recent years, driven by a combination of government support, technological innovation, and growing demand for clean energy.

Israel is a country that has been grappling with a severe energy crisis, as it has no oil or natural gas reserves of its own. As a result, the country has had to import most of its energy from abroad, which has left it vulnerable to fluctuations in global energy prices. To address this issue, the Israeli government has made a concerted effort to invest in renewable energy sources to reduce its dependence on foreign energy sources and promote energy security.

One of the key drivers of growth in the Israeli renewable energy market is government support. The government has implemented various policies to incentivize renewable energy development, including feed-in tariffs, grants, and tax incentives. For example, in 2009, the government introduced the National Renewable Energy Plan, which aims to generate 10% of Israel's energy from renewable sources by 2020. The plan included a range of financial incentives for renewable energy projects, including feed-in tariffs for solar and wind energy and grants for research and development in renewable energy technologies.

In addition to government support, technological innovation has been a driving force behind the growth of the Israeli renewable energy market. Israel has a thriving start-up ecosystem, and many companies have focused on developing new and innovative renewable energy technologies. For example, the country is a leader in developing solar thermal energy, with several companies such as BrightSource Energy and Solel Solar Systems developing large-scale solar thermal power plants. Israel is also home to several start-ups developing innovative technologies, such as concentrated photovoltaic systems, which are more efficient than traditional ones.

The Israeli renewable energy market can be broadly divided into solar, wind, and geothermal. Solar energy is Israel's most widely adopted renewable energy source, accounting for more than 70% of the country's renewable energy capacity. Most of the country's solar energy is generated through photovoltaic systems installed on rooftops, fields, and other open spaces.

Wind energy is another growing sector in the Israeli renewable energy market, with several large-scale wind projects currently under development. The country has favorable wind conditions, particularly in the Negev desert, which makes it an ideal location for wind energy projects.

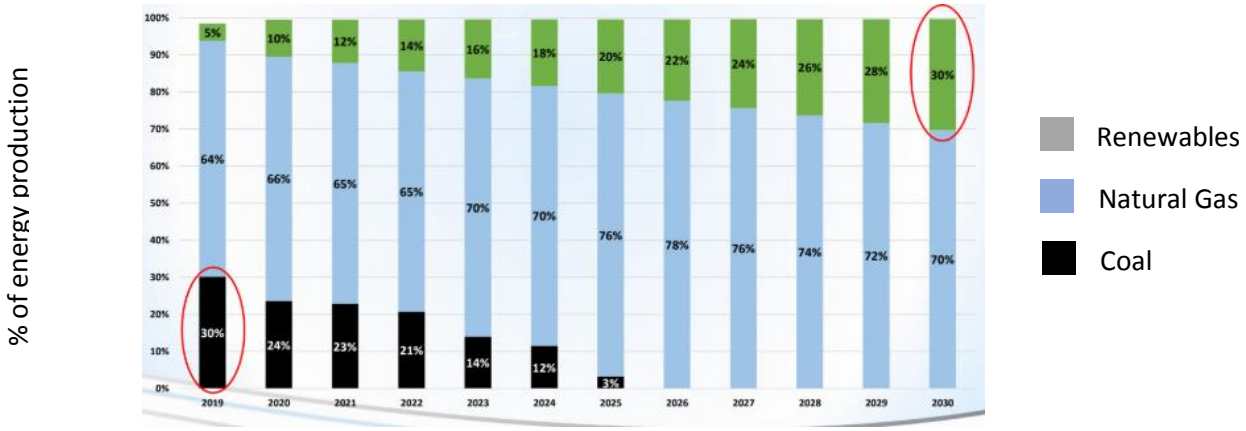
Geothermal energy is also an emerging sector in the Israeli renewable energy market. The country has several geothermal projects under development, including the Gilboa project, which is expected to generate 100 MW of electricity.

In addition to these traditional renewable energy sources, Israel is also exploring innovative new technologies, such as energy storage, which can help to mitigate the intermittency issues associated with solar and wind energy. The country has several start-ups developing energy storage solutions, including companies such as Storedot, which is developing a new type of battery technology that could significantly reduce the cost and size of energy storage systems.

Regarding market trends, the Israeli renewable energy market is expected to grow in the coming years. According to a report by the International Renewable Energy Agency, Israel is on track to exceed its target of generating 10% of its energy from renewable sources by 2020. The report also found that the country has the potential to generate up to 53% of its electricity from renewable sources by 2030, which would significantly reduce its dependence on foreign energy sources.

Israel is exceptional in its high population growth rate as well as its high electricity consumption. Today, solar power is almost exclusively the country’s renewable energy source and this will be true through 2030.

Israel's Energy Source Composition
Renewables Will Replace Coal over the Next 10 Years



In 2030 **Israel is positioned to be a world leader in solar energy dependency** at a staggering 26% of energy produced by the country. By 2030, during the noon hours, 80% of the electricity generated in Israel in expected to come from solar sources and this solar energy will surpass consumption demands during certain hours of the day.

Israel Photovoltaic Industry

The photovoltaic (PV) market in Israel has been steadily growing in recent years, driven by the country's favorable climate for solar energy and supportive government policies. Israel has abundant sunshine, with an average of 2,500 to 3,200 hours of sunshine per year, making it an ideal location for solar energy production.

As of the end of 2020, the total installed PV capacity in Israel was approximately 1.3 GW, according to the Israel Electric Corporation (IEC). The vast majority of this capacity is made up of large-scale solar installations, with only a small portion coming from residential rooftop solar.

In October 2022, Israel's Energy Ministry set a goal to generate 30% of its electricity from solar energy by 2030, with interim targets of 20% by 2025 and 10% by 2020. However, the country only produced approx. 5.8% of its energy from renewable sources by the end of 2020 just reached 10% by the end of 2022. As part of this effort, the government has introduced a range of incentives and regulations to encourage the development of renewable energy, including feed-in tariffs, net metering, and tax exemptions.

Investment in the Israeli PV industry has also been increasing in recent years. In 2019, the total investment in renewable energy in Israel was $3.3 billion, according to the Israeli Ministry of Energy. This investment was spread across a range of areas, including solar PV, wind energy, and energy storage.

One of the key challenges facing the PV market in Israel is the country's limited land resources. Israel is a small country with a high population density, which limits the availability of land for large-scale solar installations. As a result, the government has focused on encouraging rooftop solar installations as a way to increase the country's renewable energy capacity.

Another challenge facing the PV market in Israel is the country's energy market structure. The Israeli electricity market is dominated by the state-owned Israel Electric Corporation (IEC), which has been slow to adopt renewable energy sources. However, the government has introduced regulations to promote competition in the energy market, which is expected to create new opportunities for renewable energy providers.

Despite the challenges facing the PV market in Israel, the future looks bright for the industry. The Israeli government has set ambitious targets for renewable energy, and there is growing public awareness of the need to transition to more sustainable energy sources.

In addition, there is increasing interest in emerging technologies such as floating solar, which could provide new opportunities for solar energy production in Israel's limited land resources. Floating solar or floating photovoltaics (FPV) are solar panels mounted on structures that float on bodies of water, offering advantages over land-based PV such as no land occupancy, water conservation, increased panel efficiency due to cooling, and unobtrusiveness. Furthermore, advances in energy storage technology are expected to address the intermittency of solar energy and improve the reliability of solar power supply.

US Renewable Energy Ecosystem

The renewable energy market in the US has been growing rapidly in recent years, driven by a range of factors, including decreasing costs, supportive policies, and increasing public awareness of the need to address climate change. The US has a diverse renewable energy mix: wind, solar, hydroelectric, geothermal, and bioenergy.

In recent years, solar and wind power have emerged as the fastest-growing renewable energy sources in the US. The cost of solar energy has dropped significantly in recent years, making it increasingly competitive with other forms of energy. Wind energy has grown significantly, with many new projects being developed nationwide.

The US government has implemented various policies and incentives to support the growth. The passing of the IRA law in the US in 2022 has had a significant impact on the renewable energy market, particularly in terms of tax benefits for renewable energy projects. The law provides additional tax incentives for renewable energy projects, including fixing the ITC rate benefit at 30% of the establishment costs until 2023 and applying the PTC mechanism to solar projects to allow a choice between the ITC route and the PTC route. The law also applies the ITC mechanism to stand-alone storage projects and provides an option to trade the tax benefits, eliminating a tax partner. Additionally, the law provides an additional benefit of 10% for projects located in "Energy zones" or for projects that purchase local equipment. These changes further strengthen the market and provide more certainty for energy companies and are likely to drive more investment and development in the renewable energy sector.

The renewable energy market in the US is also being driven by increasing public awareness of the need to address climate change and reduce carbon emissions. Many individuals, businesses, and institutions invest in renewable energy sources to reduce their carbon footprint and contribute to a more sustainable future.

Despite the growth in the renewable energy market, challenges remain, including the need for improved energy storage solutions, grid integration, and the development of new technologies. However, the US renewable energy market is poised for continued growth and development in the coming years. The need for sustainable energy sources remains a top priority for many stakeholders.

Examining the energy market in the western US reveals several deep trends on both the supply and demand sides. On the supply side, there is a clear regulatory requirement to reduce polluting energy sources, particularly coal, while also reducing non-polluting sources, such as water sources, as these are being diverted for energy production. This shift is generating more demand for renewable energy sources, such as wind and solar, which are becoming increasingly cost-competitive and efficient. This shift towards renewables is further strengthened by the decreasing cost of energy storage, which is necessary to balance out the variable output of these renewable sources.

On the demand side, the growing population and advancing modern lifestyle are driving an increase in energy demand, particularly in urban areas. To meet this demand, energy companies are looking to expand their transmission infrastructure and invest in new energy sources. Regulatory changes enable electricity connections to the interstate transmission system and provide significant tax benefits to renewable energy projects, further stimulating investment in the renewable energy sector. Additionally, there is a trend towards establishing "Energy zones" where renewable energy projects can receive additional tax benefits.

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