



Loan Programs Office

# **An Overview of DOE's Loan Programs Office**

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## Financing the Pacific Coast Offshore Wind Supply Chain

Pacific Offshore Wind  
Summit

Robert H. Edwards Jr.

March 28, 2022

# Agenda

- DOE Approach to Offshore Wind
- Value of LPO Financing
- LPO Portfolio
- LPO Programs
- Flexible Financing
- Loan Transaction Process

# Administration Targets

Biden Administration goal of 30 gigawatts of offshore wind by 2030

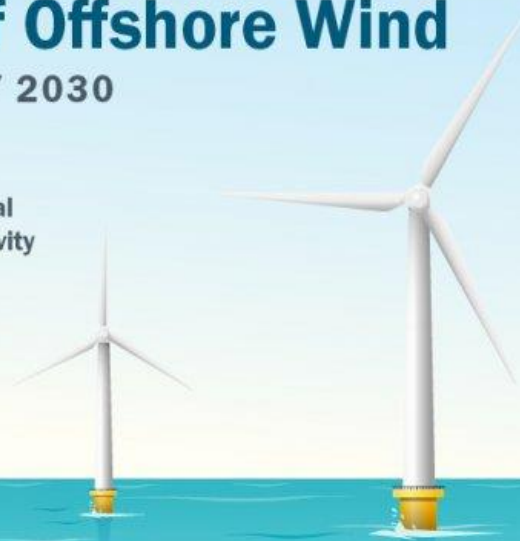
## Economic Impacts of Offshore Wind

GOAL: DEPLOY 30 GIGAWATTS BY 2030

 **77,000** jobs supported: 44,000 employed in offshore wind, 33,000 additional jobs in communities with offshore wind activity

 Investments of **>\$12B/year**

 New wind turbine installation vessels and up to **\$500M** in port upgrades



**Catalyze the growth of a new industry**

**Revitalize our nation's waterfronts**

**Provide good-paying jobs**

**Help address the climate emergency**

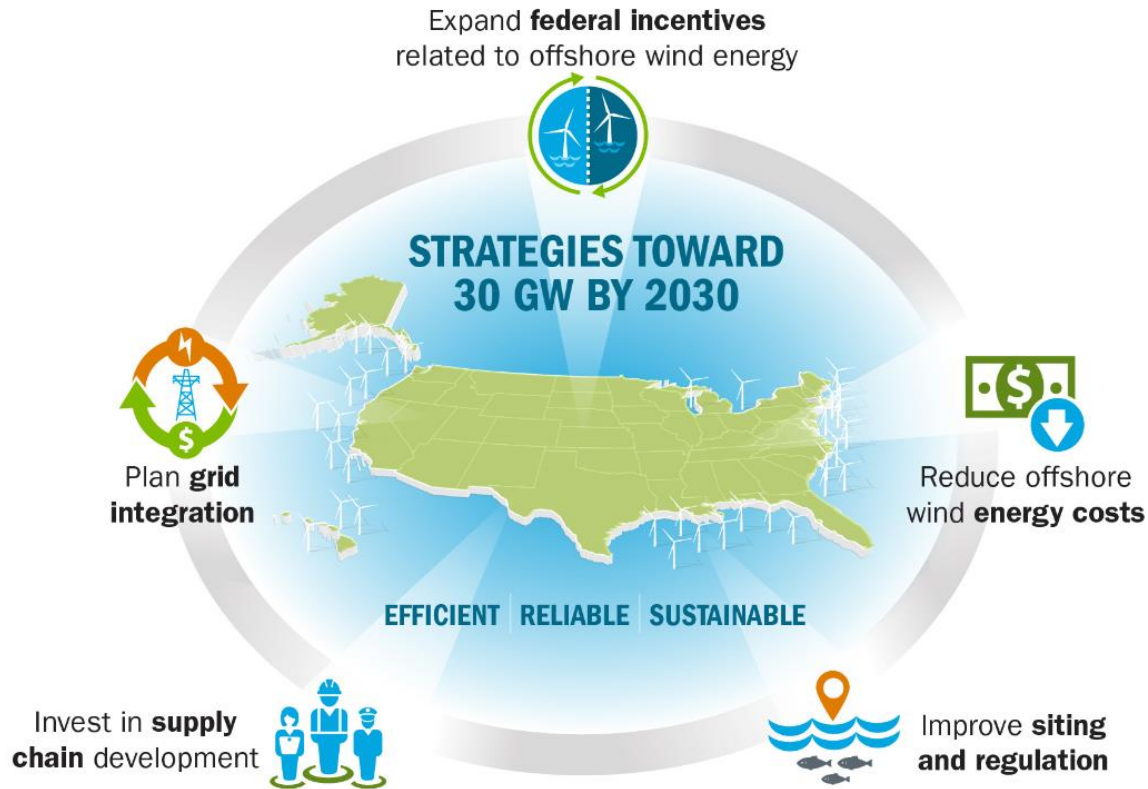
**Sets up a path for a net-zero U.S. economy with 110 GW offshore wind deployment by 2050**

Data source: White House Factsheet- Biden Administration Jumpstarts Offshore Wind Energy Projects to Create Jobs and Report to Congress

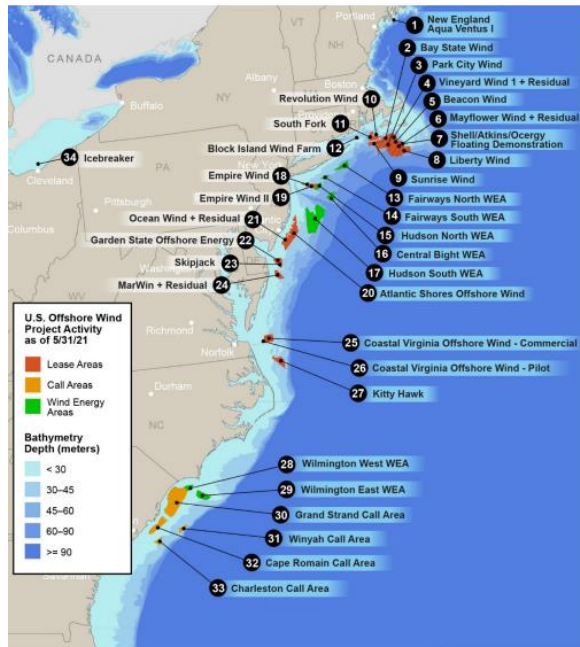
# Major Barriers to U.S. Offshore Wind Energy Deployment

- Uncertainty in the project pipeline
  - Long-term certainty is needed to attract the hundreds of billions of dollars in investment needed to sustain the industry
- Higher costs compared to established energy generation sources
  - Relatively early-stage industry, particularly floating systems
    - Need to design for US-based mass manufacturing
    - Technology challenges associated with deploying floating offshore wind in deep waters
  - Costs associated with design, skills, and equipment for ocean deployments
- Historically complex siting and permitting processes
  - Lengthy and uncertain, financial investment risk
  - Ocean user concerns around fishing, recreation, tourism, military missions and radar
  - Questions regarding environmental impacts to marine species and habitats
- Immature supply chain
  - Lack of suitable port infrastructure and specialized construction vessels
- Limited capacity of the existing grid infrastructure
  - Integration and transmission

# OSW Strategies Report



# Current State



## Installed generation

42 MW

## Capacity in pipeline, State commitments

Over 35 GW, Over 39 GW

## Lease, call, and wind energy areas (as of 12/14/21)

17 lease areas, 6 call areas, 12 wind energy areas

## Permitting Process

Two projects approved for construction (~ 930 MW total)

13 COPs currently under review

## Levelized Cost of Energy

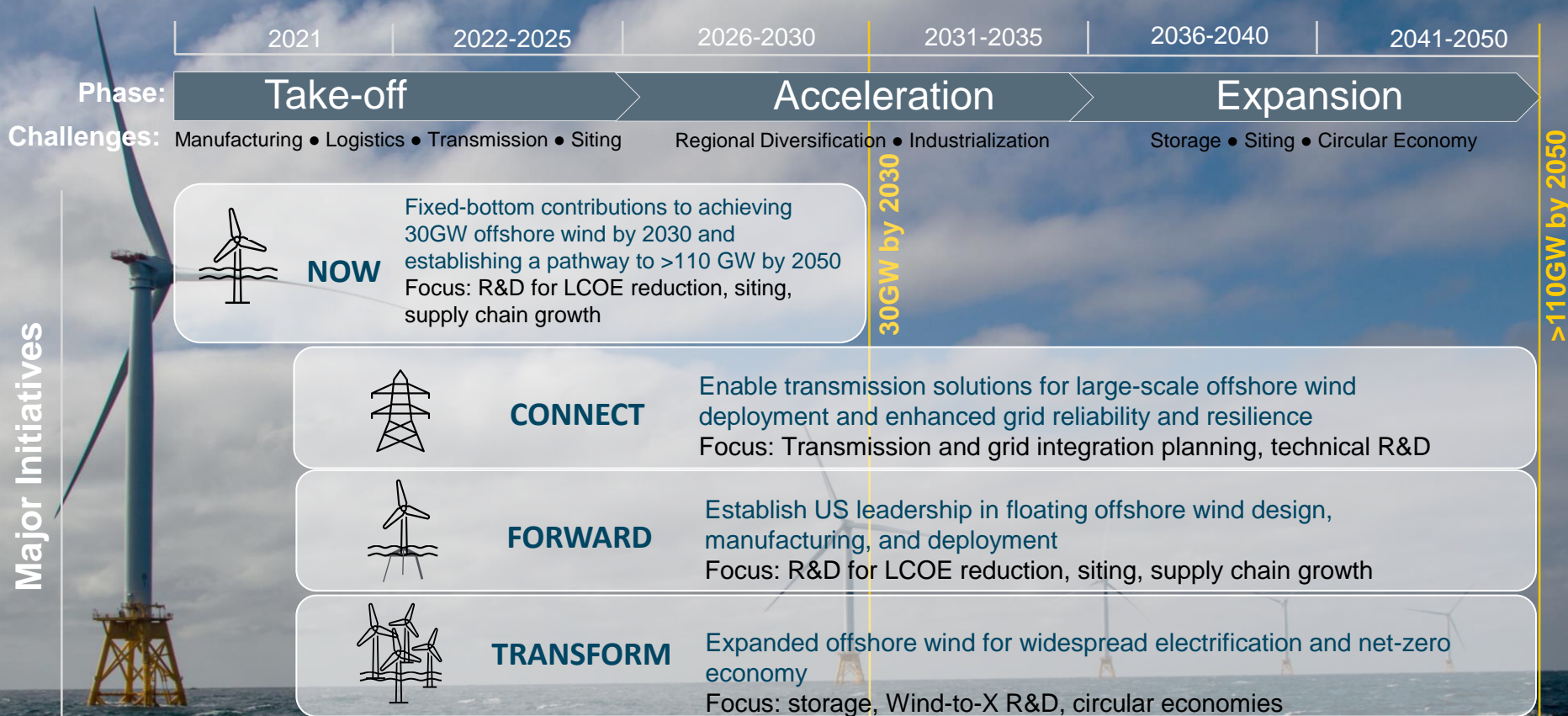
\$77/MWh (fixed-bottom)

\$129/MWh (floating)

To achieve 30 GW we need: over 2,100 wind turbines (mostly 15-MW), over 11,000 km of cables, 5 wind turbine installation vessels, 10 feeder barges, 58 crew transfer vessels, and 4 cable lay vessels

Data source: BOEM lease updates and NREL Power Sector, Supply Chain, Jobs, and Emissions Implications of 30 Gigawatts of Offshore Wind Power by 2030 Report

DOE OSW Strategy Vision: A future in which offshore wind is a vital part of the nation's energy mix and climate solution. A future in which offshore wind is economic, reliable, sustainable, just, and timely



Major Initiatives



# National Offshore Wind R&D Consortium

U.S. DEPARTMENT OF  
**ENERGY**

Office of ENERGY EFFICIENCY  
& RENEWABLE ENERGY

- ❖ A nationally-focused, independent not-for-profit organization initiated through a DOE solicitation
- ❖ Collaborates with members on focused R&D to reduce cost of offshore wind and maximize economic benefits

## Administrator

- New York State Energy Research and Development Administration (NYSERDA)
- Goal is to become self-sustaining

## Current Funding

- ~\$48M (\$20.5M in DOE funds matched by NYSERDA; plus member dues, and funding from states (VA, MD, NJ, ME, MA)

## Highlights and Status

- RFP open in 3<sup>rd</sup> Solicitation
- 46 awards totaling \$31M
- DOE actively monitors and provides contractual oversight

### Members Include

All major project developers, states (MA, MD, NY, VA), energy companies



NYSERDA  
Supported



nationalgrid



GE Renewable  
Energy



AVANGRID

BROOKHAVEN  
NATIONAL LABORATORY



Virginia Department of  
Mines Minerals and Energy



NY Power  
Authority



Renewables  
Consulting  
Group



MASSACHUSETTS  
CLEAN ENERGY  
CENTER

HITACHI  
ABB



equinor



EDF  
renewable energy



Maryland  
Energy  
ADMINISTRATION

e-on

VINEYARD  
WIND

NORTHLAND  
POWER



edp  
renewables

ANBARIC

EnBW | North  
America



# Putting together the new ARPA-E Program...

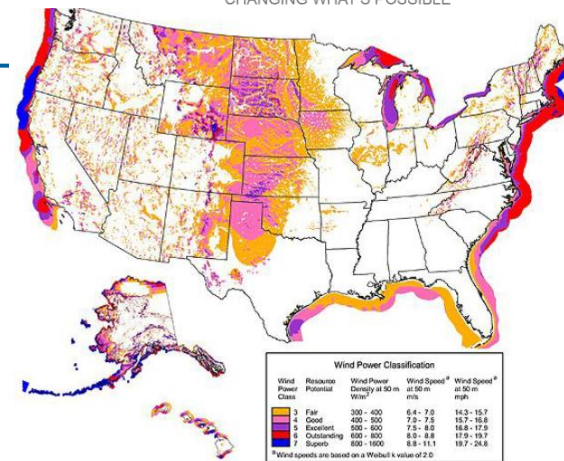
Two foundational ideas

Control Co-Design

New LCOE Metric Space

Objective

Create pathway for commercially attractive Floating Offshore Wind Turbines (FOWT)



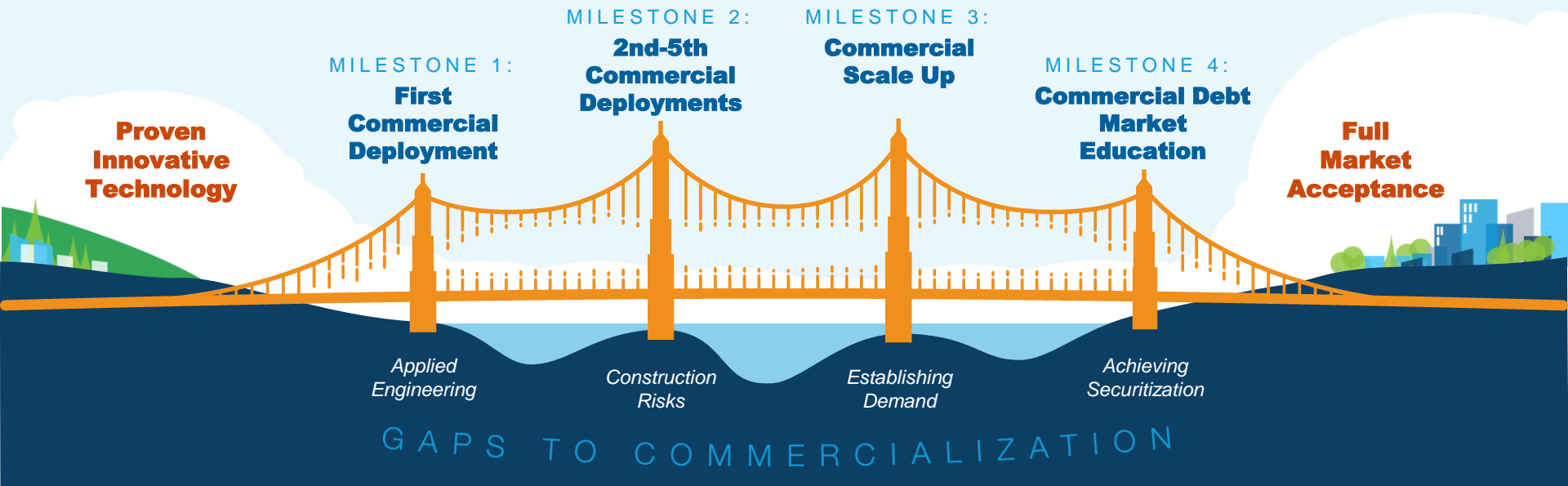
Program target: 7.5 cts\$/kWh for floating by 2022

## U.S. floating offshore wind resources

- water depth < 1,000 m, wind speed > 7 m/s
- excluding ice regions, competing-use, environmental
  - array power density of 3 MW/km<sup>2</sup>
- Total floating (>60m) = **4,178 TWh/year** > **U.S. electricity consumption** = 3,911 TWh/year (2017) which requires a small part of the gross resource area

# Bridge to Bankability

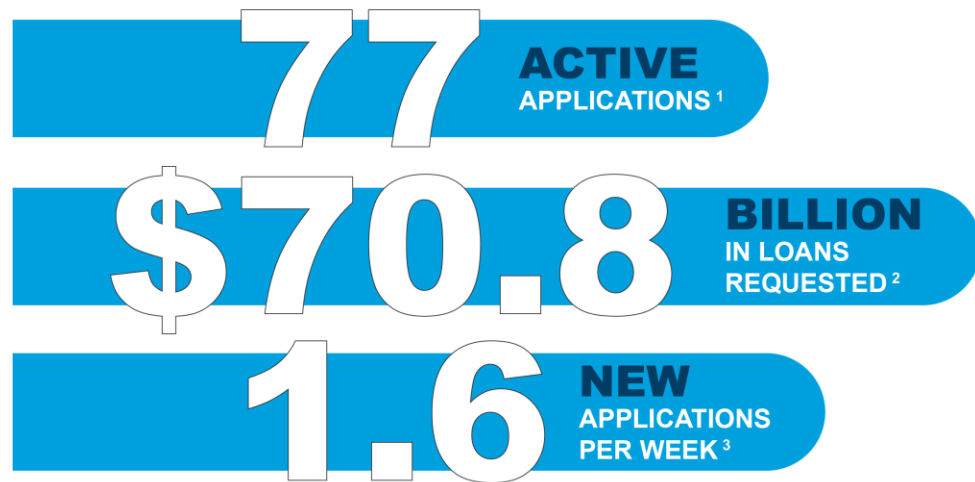
## DEPLOYMENT MILESTONES



**LPO can provide access to capital for innovative technologies along all milestones to reaching full market acceptance, overcoming key barriers to bankability.**

# Monthly Application Activity Report

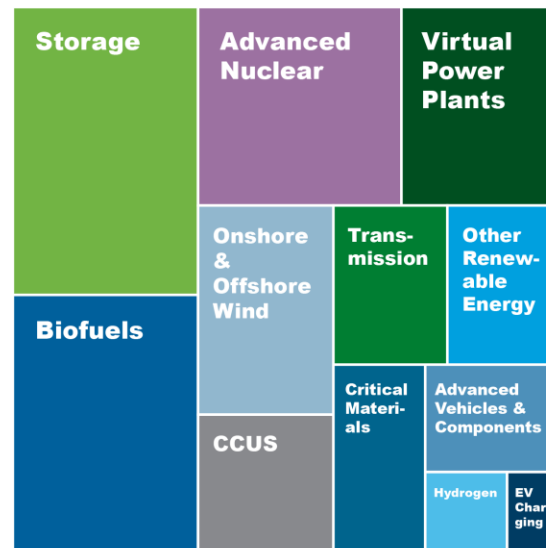
FEBRUARY 2022



Notes: \* All data updated through February 28, 2022.

- 1) Active applications are defined as completed submissions through LPO's online application portal.
- 2) Individual requested loan amounts are estimated and potential, subject to change, and not necessarily representative of final financing terms. Requested loan amounts in current active applications do not affect available LPO loan authority. Figure rounded down to the nearest \$0.1 billion.
- 3) Current rolling average of new active applications per week over the previous 24 weeks. Figure rounded down to the nearest 0.1 application.

## \$70.8 BILLION TOTAL AMOUNT OF LOANS REQUESTED BROKEN DOWN BY TECHNOLOGY AREA



# Financing American Energy Infrastructure

## The Department of Energy's Loan Programs Office (LPO)

was established for borrowers seeking access to debt financing for energy infrastructure projects.

With over \$40 billion in available debt capital, LPO programs finance high-impact projects and first-time commercializations, partnering with borrowers to customize deal structures.



### Access to Debt Capital

that private lenders cannot or will not provide.



### Flexible Financing

customized for the specific needs of individual borrowers.



### A Committed Partner

offering expertise to borrowers for the lifetime of the project.

# Over \$35 Billion in Energy Deals Financed

More than 30 projects of broadly distributed technologies across the United States.

## Renewables Innovation

Financed large-scale, innovative wind, geothermal, and transmission projects across the West.



## Utility-Scale Solar

Financed 11 utility-scale solar projects across the Southwest, catalyzing the industry in the U.S.

## Advanced Auto Manufacturing

Financed the upgrade of advanced auto manufacturing facilities across the Midwest, creating tens of thousands of jobs.

## Advanced Nuclear Energy

Financed the construction of the first new nuclear reactor in the U.S. in 30 years.

# A Diverse Portfolio of Innovative Technologies

LPO financed-projects have catalyzed new energy technologies and supported thousands of jobs.

## Advanced Nuclear Energy

**\$12 Billion**

First AP1000 reactor in the U.S. (Vogtle)

## Advanced Fossil Energy

**\$2 Billion**

CO<sub>2</sub> capture and sequestration conditional commitment. (Lake Charles Methanol)

## Wind Energy

**\$1.7 Billion**

Four onshore farms, including one of the world's largest. (Shepherds Flat)

## Transmission

**\$343 Million**

Advanced transmission lines for improved grid reliability. (One Nevada Line)

## Advanced Vehicles Manufacturing

**\$7.8 Billion**

Accelerated domestic electric vehicles manufacturing. (Nissan, Tesla)

## Concentrating Solar Power

**\$5.8 Billion**

Five CSP plants utilizing diverse technologies.

## Geothermal Energy

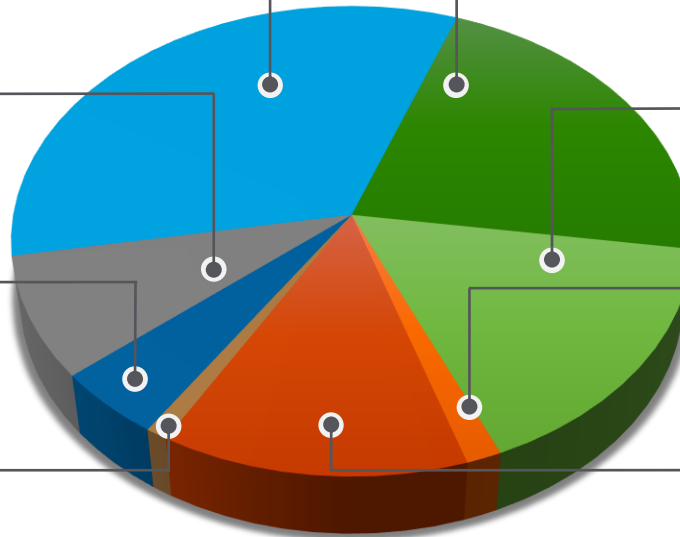
**\$546 Million**

State-of-the-art thermal extraction, revitalizing the sector.

## Photovoltaic Solar

**\$4.7 Billion**

First five utility-scale PV solar projects larger than 100 MW in the U.S.



# \$40 Billion in Available Debt Capital

LPO offers project financing across energy sectors through three distinct loan programs.

## TITLE 17 Innovative Energy Loan Guarantees



Renewable Energy & Efficient Energy  
Up to \$4.5 Billion Available



Advanced Nuclear Energy  
\$10.9 Billion Available



Advanced Fossil Energy  
\$8.5 Billion Available



## ATVM Direct Loans



Advanced Technology  
Vehicles Manufacturing  
\$17.7 Billion Available



## TELGP Partial Loan Guarantees



Tribal Energy Projects  
Up to \$2 Billion Available







# Renewable Energy & Efficient Energy



Up to \$4.5 Billion in Loan Guarantees Available

LPO helps bring renewable & efficient energy projects to commercial scale through its Title 17 Innovative Energy Loan Guarantee Program.

## Financing

LPO provides access to **debt capital** for energy projects using innovative technology when commercial lenders cannot or will not provide financing.

## Eligibility

LPO can consider renewable & efficient energy projects that:

1. Use innovative technology.
2. Reduce, avoid, or sequester greenhouse gas emissions.
3. Are located in the U.S.
4. Provide reasonable prospect of repayment.

## Technologies

Technology areas of interest include, but are not limited to:

- Advanced Grid Integration & Storage
- Alternative Fuel Vehicle Infrastructure
- Distributed Energy Projects
- Efficiency Improvements
- Enhancement of Existing Facilities
- Offshore Wind & Related Infrastructure
- Waste-To-Energy

# Offering Flexible Financing Solutions

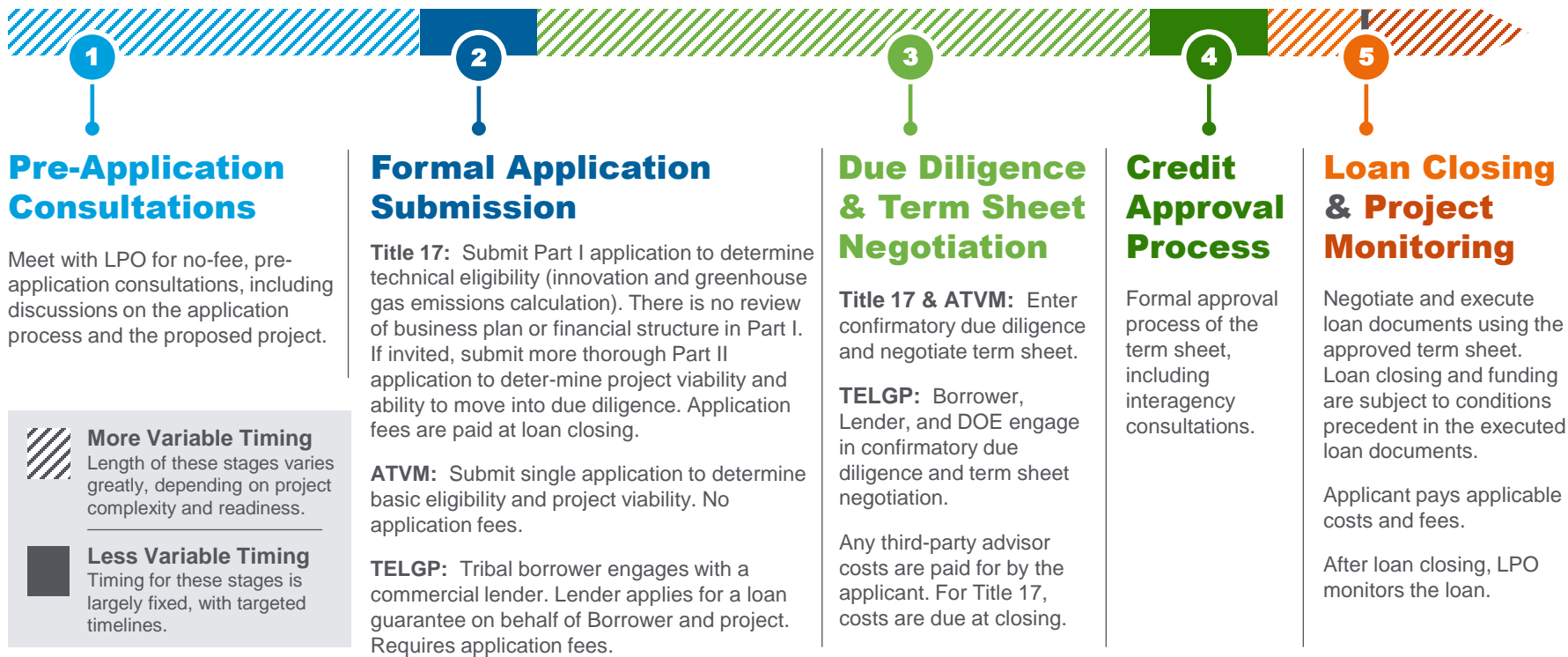
LPO can provide affordable, custom financing to meet the specific needs of individual borrowers.

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- ✓ **Various Loan Types** | Depending on the program, LPO can offer direct loans from U.S. Treasury's Federal Finance Bank (FFB), 100% guarantee of FFB loans, and partial guarantees of commercial loans. Loan terms are specific to the proposed project and are subject to negotiation.
- ✓ **Affordable Debt & Long Tenor** | Senior secured debt priced competitively with commercial rates.
- ✓ **Flexible Deal Structures** | Structures may include project finance, structured corporate, corporate or warehousing lines.
- ✓ **DOE Role** | Can serve as sole lender or as a co-lender.
- ✓ **Debt Amount Determination** | Based on credit profile, business plan, market risk, technology, cash flows, project risk allocation and other relevant factors.
- ✓ **Viability Standard** | Emphasis placed on certainty of cash flow to the project during initial financial viability review and during subsequent due diligence.

# LPO Moves Ideas to Applications to Projects

LPO engages early with applicants and remains a partner throughout the lifetime of the loan.





# LPO

Loan Programs Office

## Let's Talk About Your Project

Contact LPO to see what financing options may be available for your project:



Call or write to schedule a no-fee, pre-application consultation: **202-586-8336** | **lpo@hq.doe.gov**



Learn more about LPO and all of its lending programs at: **energy.gov/LPO**

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