

Strategic Initiative: Pathways to Decarbonization

Board of Directors Update March 2021

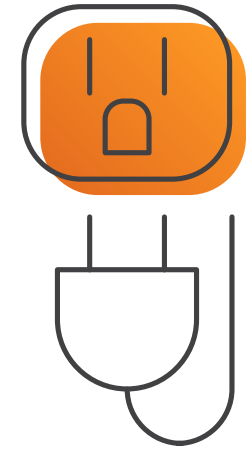
Jeremy Bowers, Jessica de la Torre, Colton Kennedy, Paul Fortney, Emily Muth
March 16, 2021

Agenda

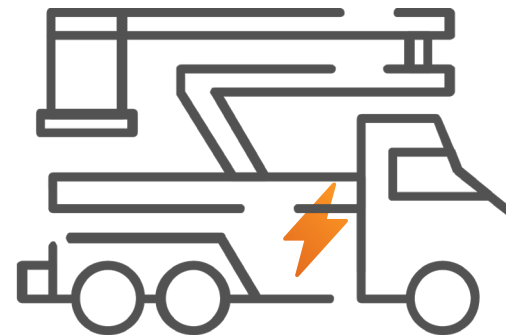
1. Community
2. Customer
3. Internal Operations
4. Energy Portfolio
5. Outreach



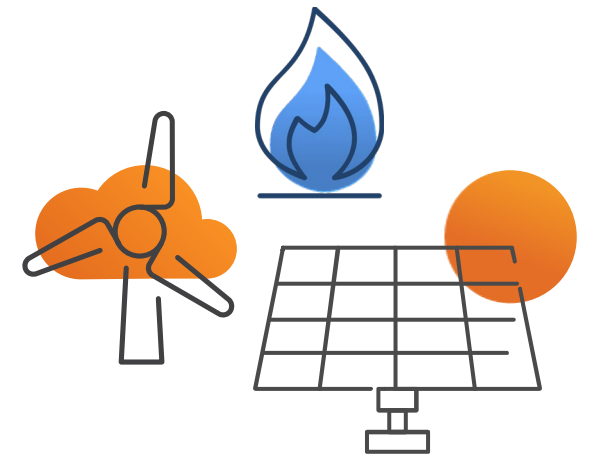
Community Partner



Customer
Products & Services



Internal Operations



Energy Portfolio



Decarbonization: Community Project





Our Approach

A Different Perspective

- Review Climate Action Plans to understand how communities approach decarbonization
- Aggregate decarbonization and adaptation strategies across Climate Action Plans to identify shared areas of focus.

COMMUNITY LENS



Selected Climate Action Plans

- Mix of regionally and peer utility relevant communities.
- Recent Climate Action Plans; varying level of detail for Greenhouse Gas (GHG) mitigation measures.
- 4 of 6 communities declared a climate emergency in 2019.





Our Approach

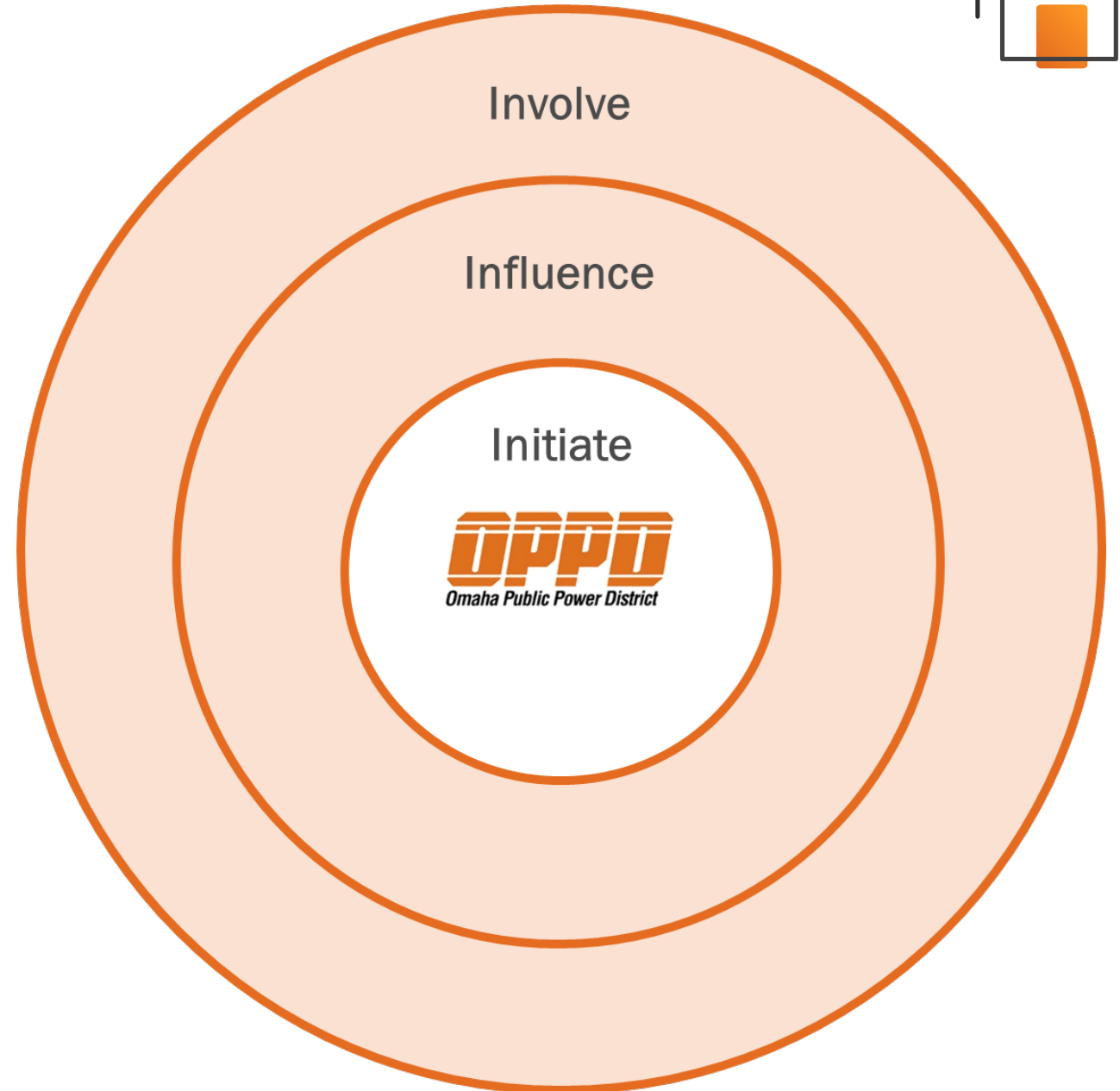
Influence Meaningful Change

- Define Degree of Influence concept as key consideration for identifying collaboration opportunities.
- Determine other attributes of shared decarbonization strategies to develop prioritization framework.

COMMUNITY LENS

PRIORITIZATION
FRAMEWORK

Degree of Influence concept categorizes actions related to OPPD's ability to effect change across the service territory.

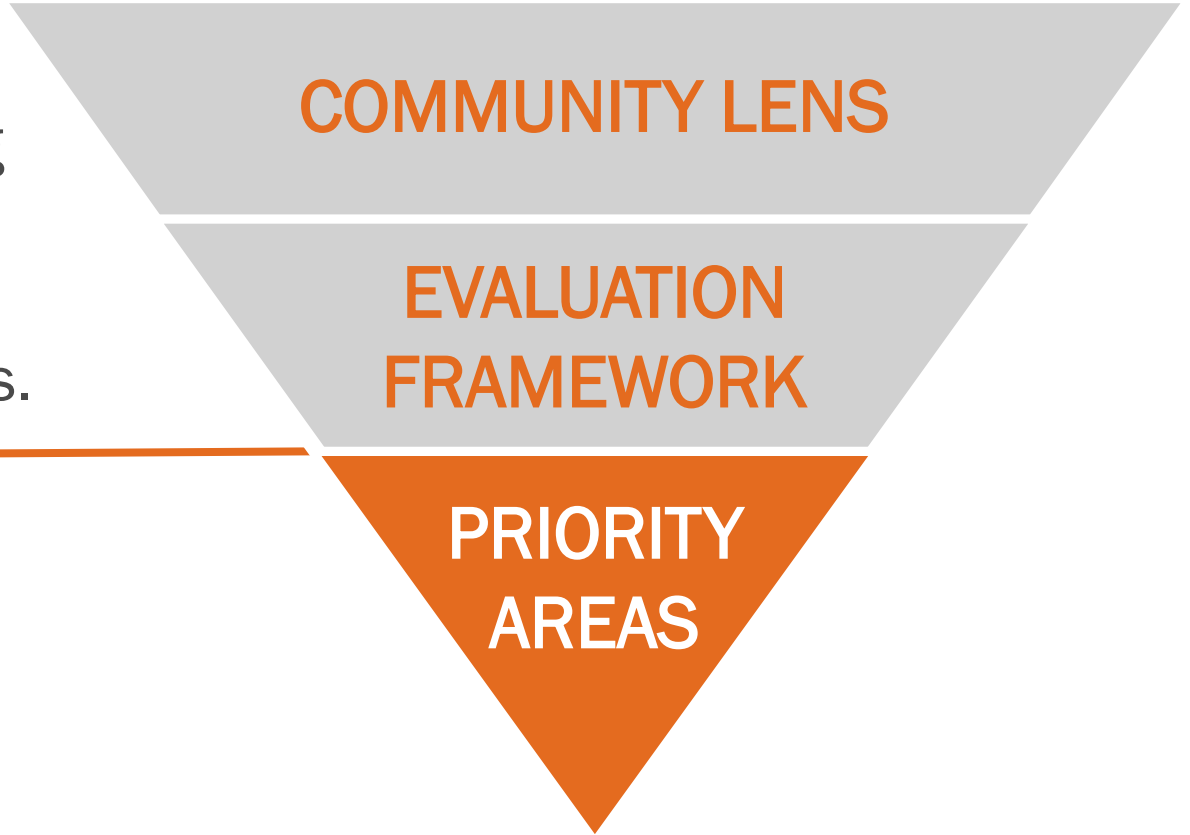




Our Approach

- Evaluate each aggregated decarbonization strategy applying the prioritization framework.
- Identify key collaborators for priority decarbonization strategies.

Focus on What Matters Most



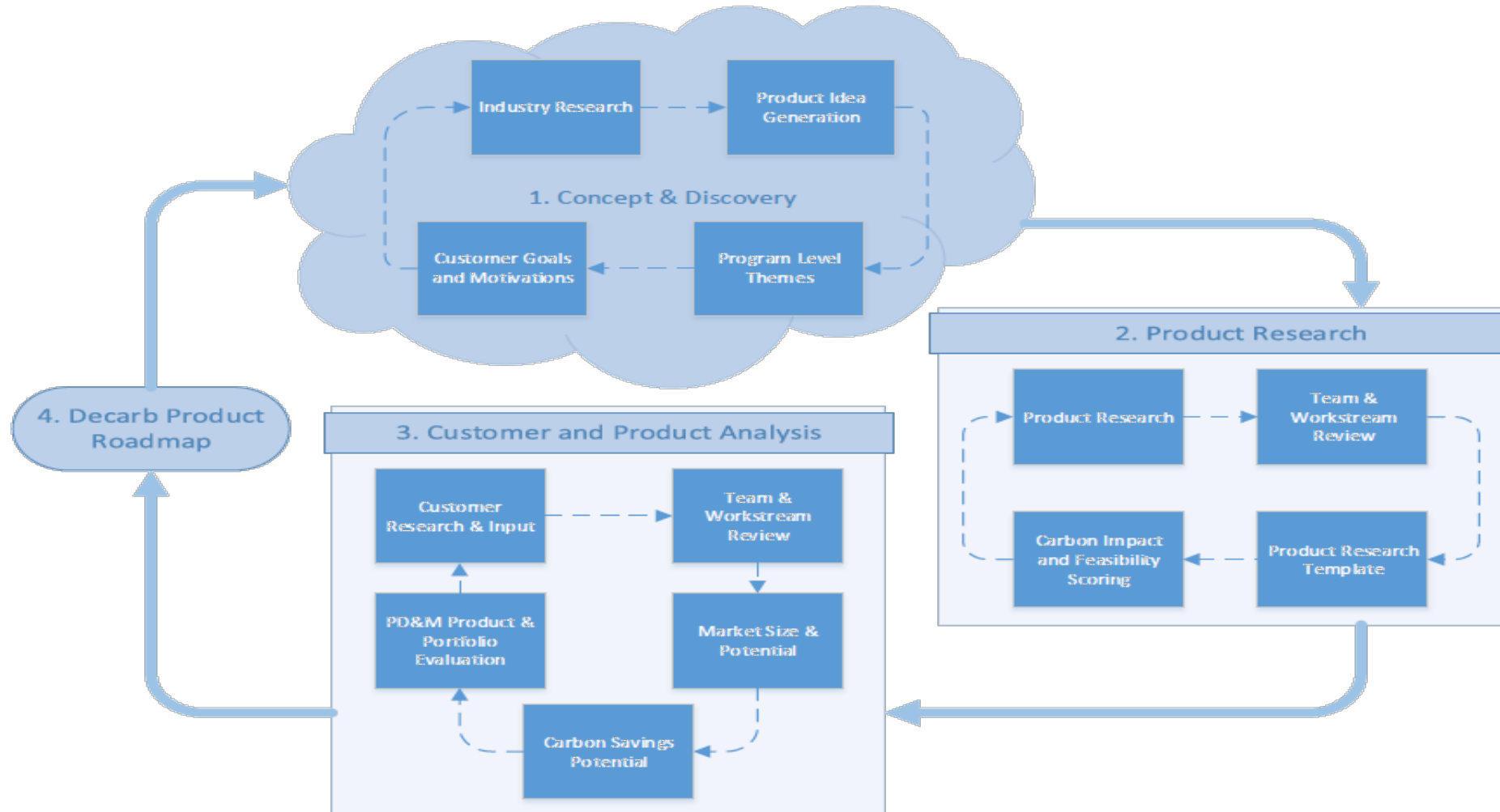


Decarbonization: Customer Project



Decarb Product Evaluation Framework

The decarb product roadmap deliverable isn't a one and done exercise, but a continuous ongoing process resourced within Product Development and Marketing (PD&M).



Decarb: Customer Motivations



Residential:

- Customers want to positively impact the environment, improve reliability and save money, but lack the education and information to take action
- Customers believe they can make an impact and in many cases would be willing pay a little more to do so
- Customers believe in corporate responsibility to improve the environment and prefer to do business with those demonstrating leadership
- Only 4% of OPPD customers feel their utility is most responsible for improving the environment, rather they view as a trusted source for information for what they can do personally.

C&I:

- Solutions seem big, intimidating and there is a desire for more education
- Sustainability is almost a requirement
- Customers look at utilities to help and partner with to make an impact (more so than residential).

Sources: DSM Potential Study, What Does Green Mean to You Workshop, JD Power Results, Cogent Results, Green Power Redesign Phase I, Other Utilities Decarb Strategies (Austin Power, Duke Energy, etc...)

Project Timeline

Decarb: Customer Workstream

Activities	Q3 2020	Q4 2020	Q1 2021	Q2 2021	Q3 2021	Q4 2021
✓ Discovery	█					
✓ Concepting	█	█				
✓ Market Analysis		█	█			
Product Evaluation & Analysis			█	█		
Carbon Reporting Requirements			█	█		
Strategy Roadmap				█	█	
Operational Plan					█	
Project Close-out						█

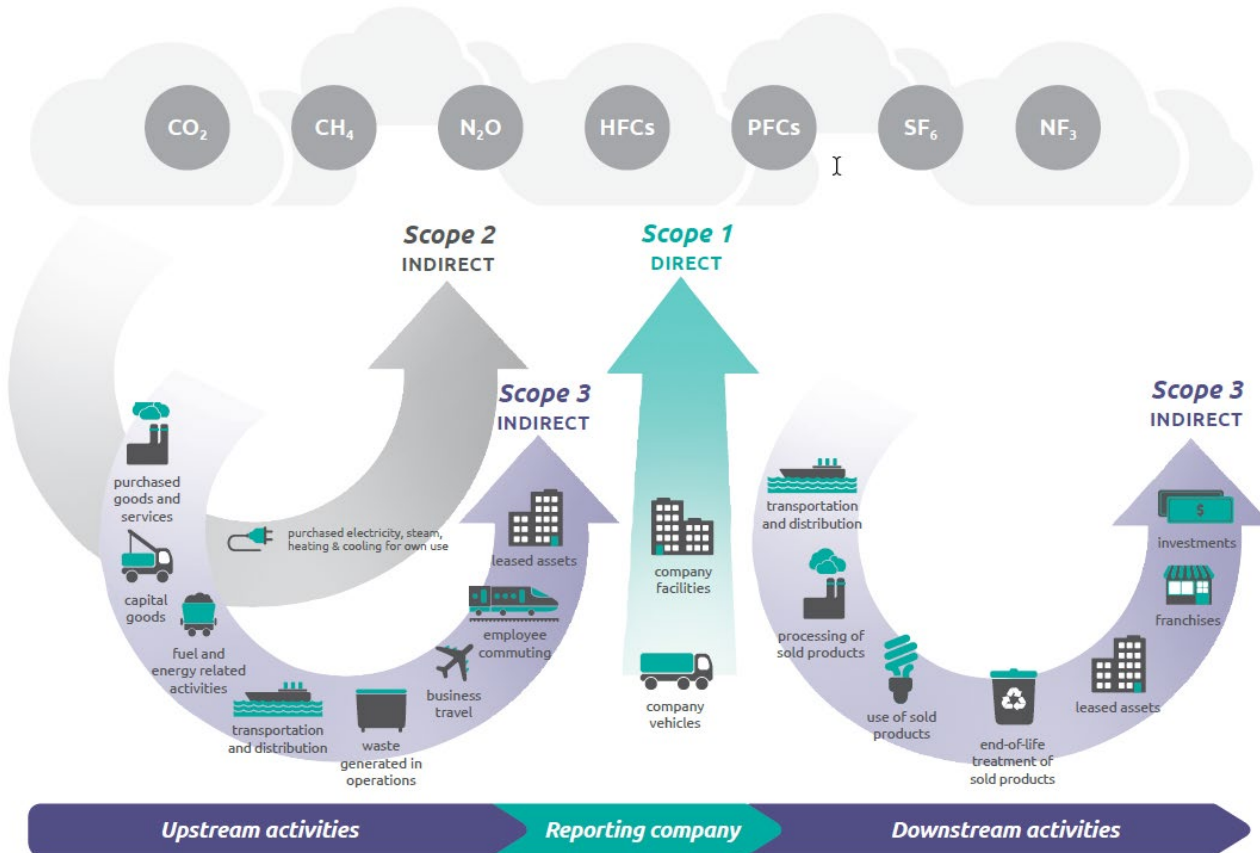


Decarbonization: Internal Operations Project





Internal Operations Project



Source: Figure 1.1 of Scope 3 Standard.

- Benchmark
 - Large Public Power Council (LPPC) Survey:
 - 19 response received
 - 7 utilities currently conducted a corporate inventory of Green House Gas (GHG) emissions
 - 2019 CDP Climate Change Reports
 - Reviewed 14 reports from electric utilities
- Ruby Canyon Environmental Engagement
 - Led quantification on 3 emission sources
 - Reviewed methodology OPPD used for quantification on other emission sources
- Organizational Boundary: Equity share approach
- Operational Boundary



GHG Scope 1, 2 and 3

Scope 1 Emission Sources:

- Stationary Combustion Sources
 - Fossil Generation
 - Internal Combustion Engines: Emergency Engines, Auxiliary boilers
- Mobile Combustion Sources
 - Vehicle Fleet
 - Equipment Propane
 - Coal Handling Equipment
- Process/Fugitive Sources
 - Refrigerants (facilities and transportation)
 - Coal Pile
 - T&D SF6 Leaks
 - Natural Gas Pipeline
 - Welding-Acetylene
 - Fire Suppression Systems

Scope 2 Emission Sources:

- OPPD Consumed Electricity
- T&D Losses

Scope 3 Emission Sources:

- Purchased Goods and Services*
- Energy and Fuel Related Activities
 - Coal Purchases
 - Coal Rail Transportation
 - Purchased Power Delivered to End-Users
 - Natural Gas Purchases
- Business Travel
- Employee Commute
- Waste

* Capital Goods emissions included in this category

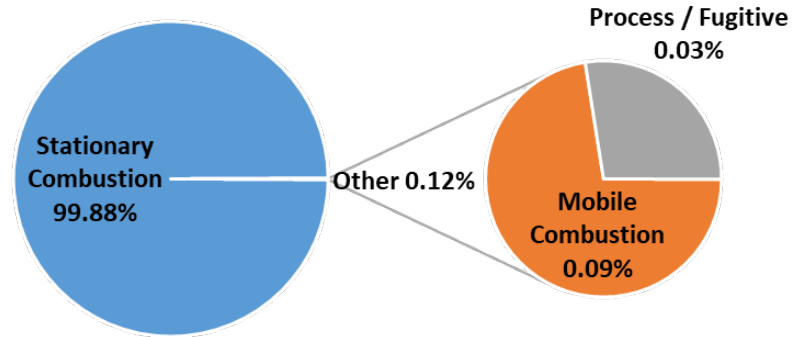


GHG Scopes 1, 2 and 3

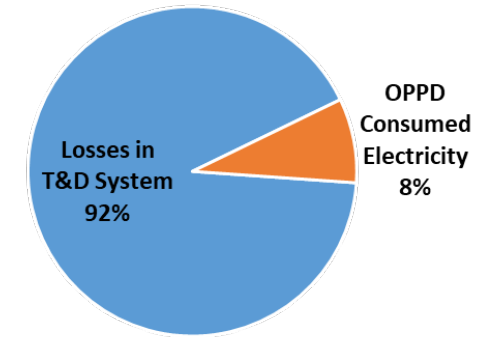
	Metric tons CO ₂ e			
	2017	2018	2019	Average
Scope 1	10,657,608	10,951,779	9,161,659	10,257,015
Scope 2	73,646	69,581	84,601	75,942
	10,731,254	11,021,359	9,246,260	10,332,958

Scope 3	Metric tons CO ₂ e			
	2017	2018	2019	Average
Purchased Goods and Services	178,869	113,939	133,088	141,965
Energy and Fuel Related Activities	1,345,651	1,263,055	1,679,940	1,429,549
Waste	10,001	13,519	8,583	10,701
Business Travel	257	255	277	263
Employee Commute	4,775	4,286	4,388	4,483
	1,539,552	1,395,054	1,826,274	1,586,960

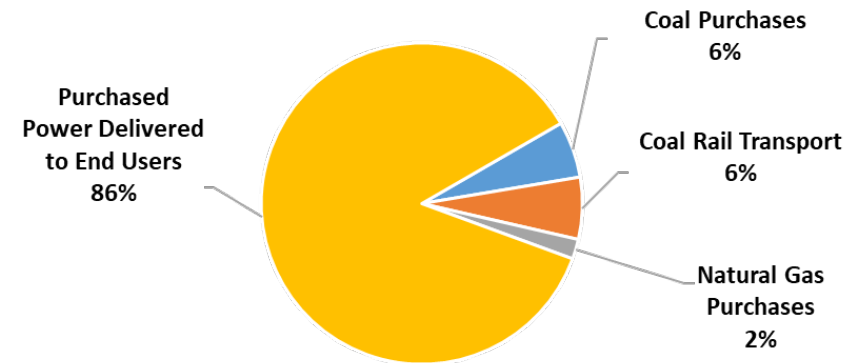
Scope 1: Avg Emissions



Scope 2: Avg Emissions



Energy and Fuel Related Activities:
Avg Emissions





GHG Inventory and Next Steps

Key Takeaways for Internal Operations

- Net-zero carbon goal:
 - Scopes 1 and 2 include in SD7 net zero carbon goal
- Scope 3
 - Continue measuring Energy and Fuel Related Services category
 - Purchased goods and services category
 - One-time detailed exercise (2019)
 - Other years emissions derived
 - Evaluate in 5 year if detailed exercise should be repeated
- GHG Inventory
 - Part of OPPD's **sustainability program**
 - Once established, OPPD to evaluate if it will report to a program
 - Conducting the yearly GHG inventory will now transition to the Environmental Team

Metric tons CO ₂ e				
	2017	2018	2019	Average

Required

Scope 1	10,657,608	10,951,779	9,161,659	10,257,015
Scope 2	73,646	69,581	84,601	75,942
Scope 1+2	10,731,254	11,021,359	9,246,260	10,332,958

Optional

Scope 3	1,539,552	1,395,054	1,826,274	1,586,960
Scope 1+2+3	12,270,806	12,416,413	11,072,534	11,919,918



Sustainability: Think Bigger

- Triple Bottom Line framework encompasses **economic**, **social** and **environmental** performance.
- Evolved into an accounting framework and balancing act driven by a trade-off mentality.
- Instead imagine...



“A triple helix for value creation, a genetic code for tomorrow’s capitalism, spurring the regeneration of our economies, societies, and biosphere”

Harvard Business Review, “25 Years Ago I Coined the Phrase “Triple Bottom Line.” Here’s Why It’s Time to Rethink It,” John Elkington, June 2018



Sustainability Framework Development Approach

1 Industry Benchmarking



2 Connect to OPPD strategic directives



3 Sustainability Inventory Interviews



4 Draft Sustainability Framework & Recommendations





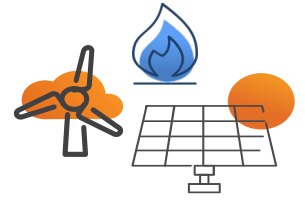
Draft Sustainability Framework

SERVING THRIVING
COMMUNITIES



ENVIRONMENTAL
STEWARDSHIP

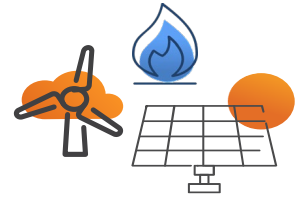
ENGAGED AND
EMPOWERED WORKFORCE



Decarbonization: Energy Portfolio Project



Energy Portfolio Update

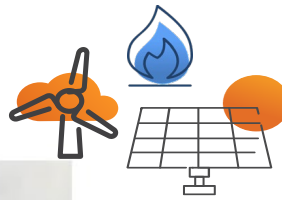


- E3 introduction
- Overall project plan
- Technical modeling
- High-level stakeholder plan
- Integrated Resource Plan coordination
- Multi-sectoral modeling
- Net-Zero goal modeling approach
- Key takeaways

E3 Introduction



Energy+Environmental Economics



- E3 is a San Francisco-based consulting firm founded in 1989 specializing in electricity economics with approximately 75 staff
- E3 consults extensively for utilities, developers, government agencies, and environmental groups on clean energy issues
- Services for a wide variety of clients made possible through an analytical, unbiased approach
- Our experts provide critical thought leadership, publishing regularly in peer reviewed journals and leading industry publications



Arne Olson
Senior Partner
Responsible Partner

Mr. Olson leads E3's resource planning practice. Since joining E3 in 2002, he has led numerous analyses of how renewable energy and greenhouse gas policy goals could impact system operations, transmission, and energy markets.



Zach Ming
Director
Project Lead

Mr. Ming leads the development of energy models and communicates findings on behalf of utilities, regulatory agencies, and trade groups. Since joining E3 in 2013, he has managed numerous resource planning projects and teaches a class at Stanford University on electricity economics.



Aaron Burdick
Managing Consultant
Project Manager

Mr. Burdick joined E3 in 2019 and helps E3 clients solve technical and policy challenges related to renewable energy integration. He joined E3 from utility Pacific Gas & Electric, where he led the development of PG&E's 2018 Integrated Resource Plan. Aaron also spent four years at energy consultancy ICF International.

Additional Staff



Gabe Mantegna

Chen Zhang



Ari Gold-Parker

Vignesh Venugopal



Bill Wheatle

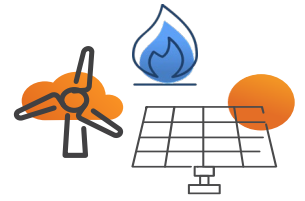
Sumin Wang



Charlie Duff

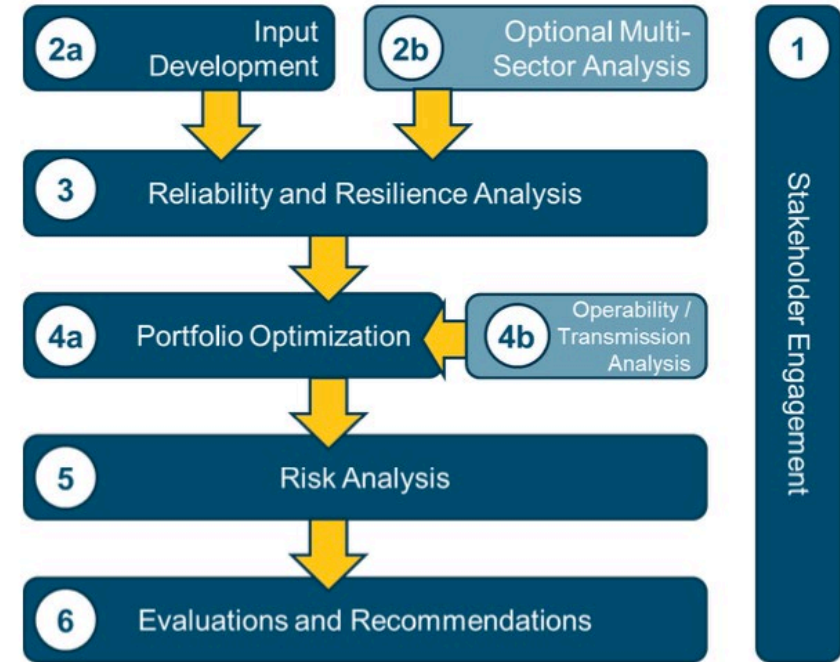
Sample E3 Clients:



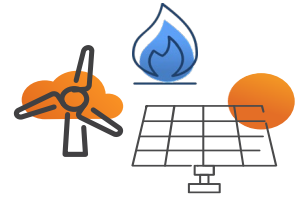


Overall Project Plan

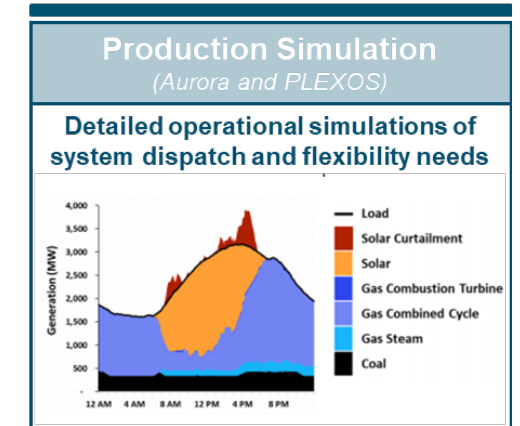
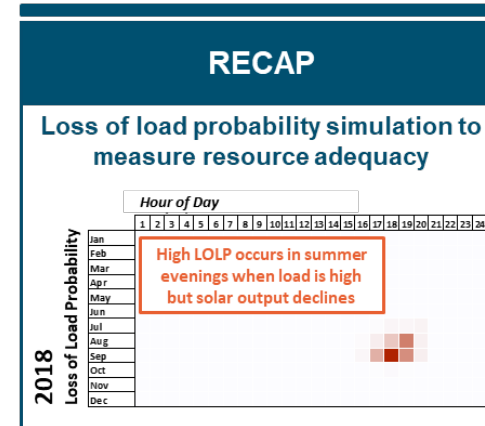
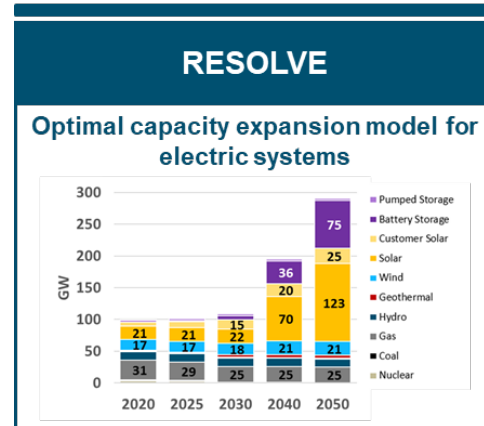
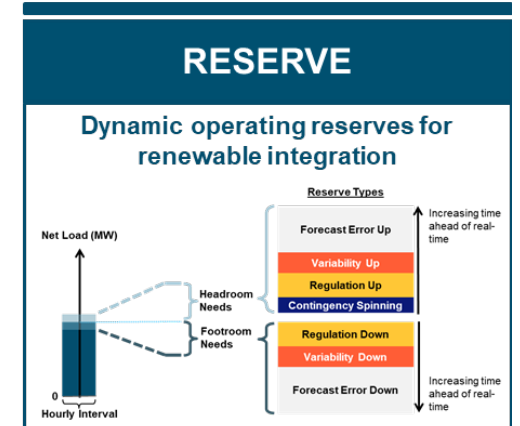
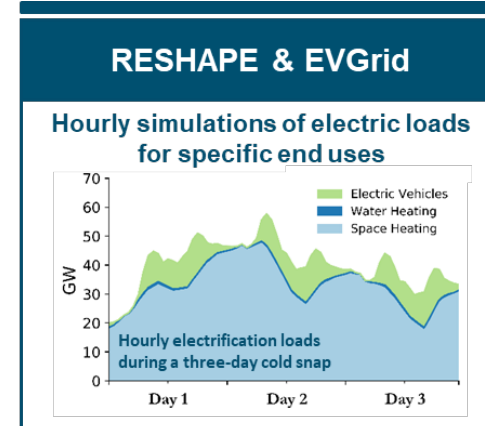
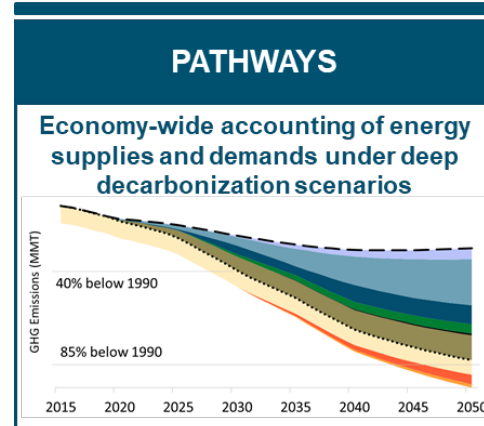
- OPPD's full Energy Portfolio decarbonization study encompasses multiple sequential technical analyses that will take place throughout 2021



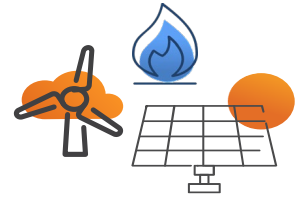
Technical Modeling



- The Energy Portfolio analyses leverages E3's suite of technical modeling tools to achieve deep portfolio decarbonization
- E3's analysis is paired with robust resource adequacy and operability studies to ensure technical portfolio feasibility
- The modeling effort will NOT include detailed transmission and power-flow analyses. Further studies will be required prior to final decisions or actions



High-Level Stakeholder Plan



A Broad and Inclusive Stakeholder Process:

- Six (6) technical external stakeholder workshops throughout the modeling process
- Six (6) internal workshops open to employees
- Facility Ambassadors to support internal conversations
- OPPD Community Connect online portal
- The Wire and online outreach

We want to understand why decisions are being made

We want transparency on assumptions and how feedback was used

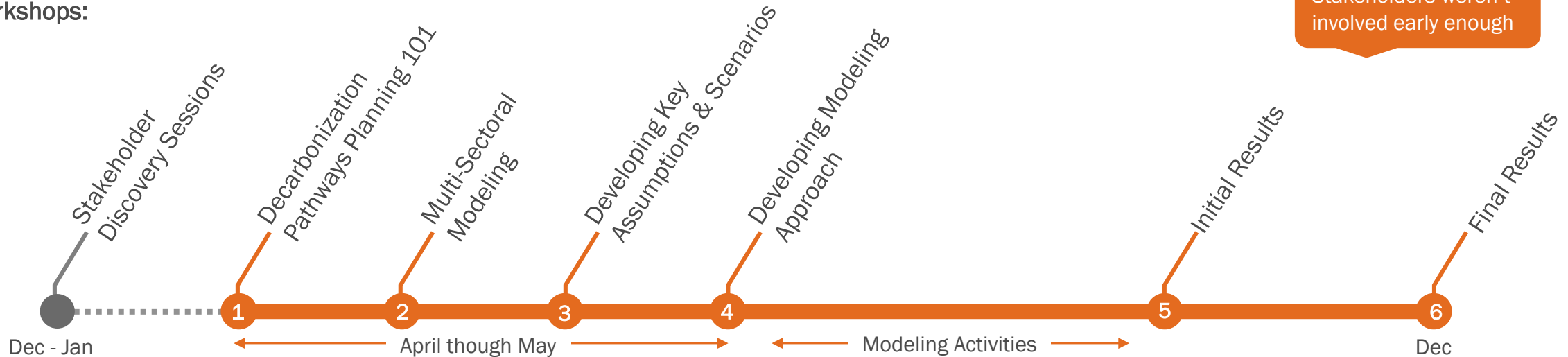
We want to see ambitious scenarios

We felt 'informed' during last IRP but didn't contribute to the process

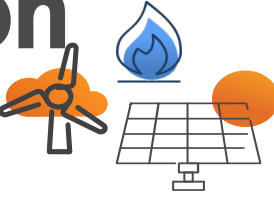
I'd like infographics to understand and share OPPD's considerations

Stakeholders weren't involved early enough

External Technical Workshops:



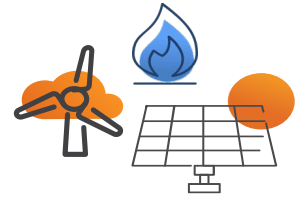
Integrated Resource Plan (IRP) & Decarbonization Coordination



Two major resource planning tasks will occur in 2021:

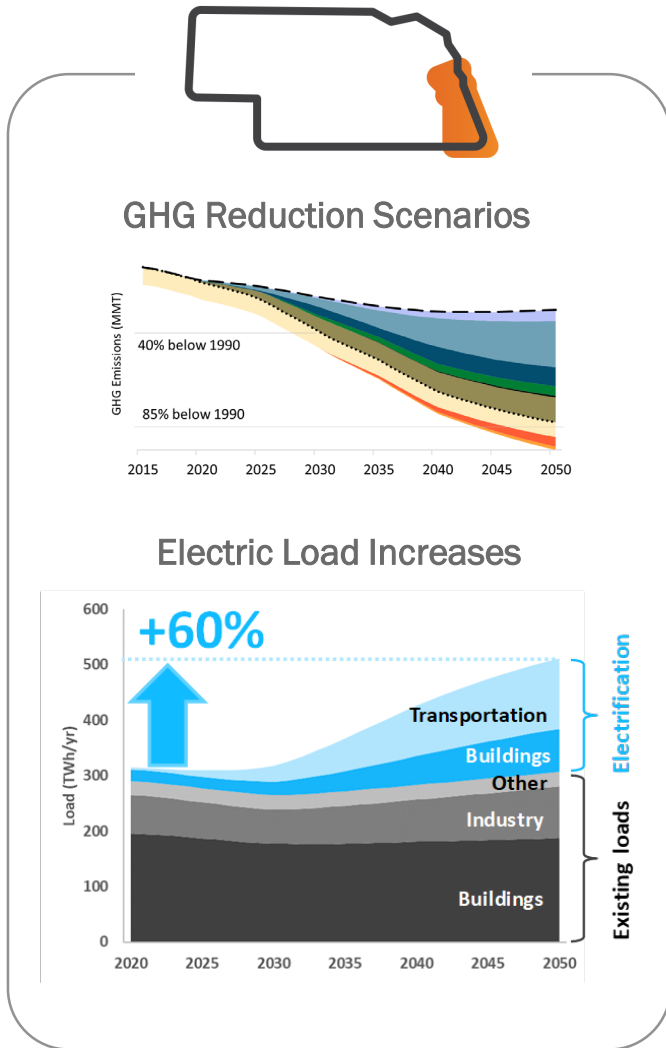
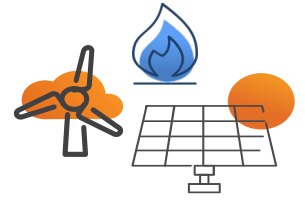
- **Decarbonization: Energy Portfolio** is due December 2021
 - Due date is set by OPPD’s Senior Management Team(SMT) and Board of Directors (BOD)
- **5-Year Integrated Resource Plan (IRP)** is due February 28th, 2022
 - OPPD is legally required to submit a 5-Year IRP to Western Area Power Administration (WAPA)
 - Requirements outlined by 10 Code of Federal Regulations 905 (10.CFR.905)
 - OPPD may file an extension up to 6 months
- Both tasks outline OPPD’s future resource portfolio. They vary in that:
 - IRP must include specific plans in the next 5 years
 - Decarbonization will identify ‘actionable pathways’

IRP + Decarbonization Coordination



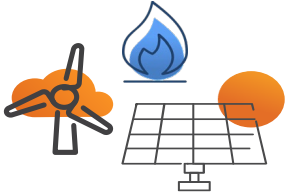
- OPPD's intent is to use the results of the decarbonization study to inform its Integrated Resource Plan filing
- Dependent on BOD satisfaction with modeling progress, stakeholder engagement, and unforeseen modeling complexities, there is risk that modeling may extend past the IRP submission deadline
- In the case that the Energy Portfolio modeling extends beyond the IRP deadline, OPPD would file its current 5-Year resource plan and update its plan with WAPA after completion of its study

Multi-Sector Modeling



- Economy-wide decarbonization will create direct impacts on electric load growth
 - Examples include electrification of transportation, heating, agriculture, and other end uses
- E3 and OPPD will conduct broad modeling across industry segments as inputs into its decarbonization modeling
- Multi-Sectoral modeling results will support OPPD's broader decarbonization leadership in the community

Approaches to Net Zero Carbon



more constrained ←

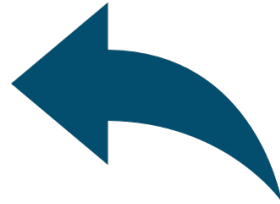
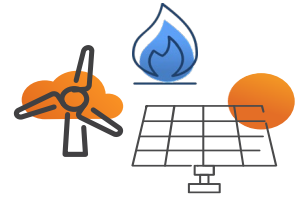
→ less constrained

100% Renewables	Zero Carbon	Net Zero Carbon	Near-zero Carbon
<ul style="list-style-type: none"> • 100% of generation from wind, solar, hydro, and battery storage • No combustion or nuclear 	<ul style="list-style-type: none"> • 100% of generation from zero-emitting resources • Leaves room for hydrogen, renewable natural gas, nuclear, and/or CCS 	<ul style="list-style-type: none"> • Leaves room for some continued fossil generation due to some sort of offset(s) 	<ul style="list-style-type: none"> • Allows for minimal electricity emissions (e.g. 1-5% of generation)

Not technically or economically feasible (except maybe in regions with very high hydropower penetrations), but included for completeness

Inconsistent with OPPD’s “net-zero carbon” goal, but could be studied to draw out carbon abatement cost curve

Net Zero GHG Offset Types



Electricity Exports

Description: net-zero is defined on an annual basis, allowing emitting generation or imports to be offset by zero-emitting exports.

Pros: low cost; encourages regional coordination.

Cons: breaks down when neighboring jurisdictions are also pursuing the same net zero carbon goal.



Intersectoral Credit

Description: claiming credit for emissions reductions achieved through electrifying other sectors.

Pros: low to zero cost; supports utility action on electrification.

Cons: incompatible with an economy-wide net zero target, which is needed to meet climate goals; challenging to confirm “incrementality” of utility actions.



GHG Offsets

Description: involves the purchase of traditional GHG offsets, which can include projects such as tree planting or carbon/methane capture.

Pros: low cost.

Cons: difficult to prove “additionality” of GHG offsets (would they have been pursued anyways?); not necessarily compatible with an economy-wide net zero target.



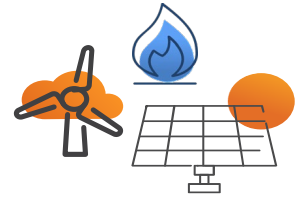
Negative Emissions

Description: offsetting remaining emissions through negative emissions technologies such as Direct Air Capture.

Pros: compatible with an economy-wide net zero target; possibly lower cost than 100% zero-carbon electricity.

Cons: high cost uncertainty due to lack of commercialized technologies.

Modeling Net Zero



Contributions

GHG Protocol
Based





Scope	Description	Avg. CO2e 2017-2019
Scope 1	Stationary Combustion	10,244,688
	Other (vehicles, fugitive emissions)	12,327
Scope 2	All (used electricity, T&D losses)	75,942
Scope 3	Purchased Power (used to serve end-use customers)	1,230,558
	Other (fuel related activities, bus. Travel, commute, waste)	356,402
Total CO2e Contributions, Tons		11,919,918

Inclusion in Energy Portfolio Modeling
<i>Include</i>
<i>Excluded</i>
<i>Include</i>
<i>Include</i>
<i>Excluded</i>

Note: Emission sources shown here as excluded from the energy portfolio modeling efforts will be addressed through OPPD's Internal Operations and Sustainability efforts.

Offsets

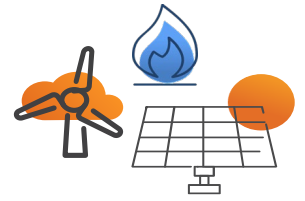
OPPD Selected
Offsets

Description	CO2e
 GHG Offsets	0
 Negative Emissions Technologies	0
 Electricity Exports	0
 Inter-sectoral Credits	NA
Total CO2e Offsets, Tons	0

Inclusion in Energy Portfolio Modeling
<i>Sensitivity Analysis</i>
<i>Sensitivity Analysis</i>
<i>Sensitivity Analysis</i>
<i>Excluded</i>

Note: OPPD will continue to advocate for inter-sectoral GHG reductions, but is not intending to consider those efforts as portfolio offsets in its modeling.

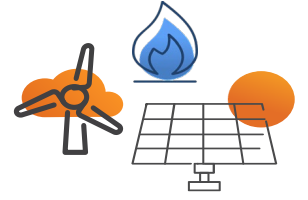
Net CO2e, Tons **11,919,918**



Energy Portfolio GHG Objectives

- Multiple modeling GHG objectives will frame the cost and technology impacts of alternative approaches and inform OPPD's future definition of its Net Zero goal
 - **Absolute Zero**
 - 100% GHG Reduction
 - No Offsets or Negative Emissions Technologies
 - **Net-Zero**
 - 100% GHG Reduction
 - GHG Offsets and Negative Emissions Technologies Allowed
 - Sensitivity with Electricity Export offsets
 - **Near-Zero**
 - 80% to 95% GHG Reductions
 - GHG Offsets and Negative Emissions Technologies Allowed
 - These scenarios inform OPPD of the marginal cost and potential technology alternatives as it approaches its Net Zero goal

Energy Portfolio Key Takeaways

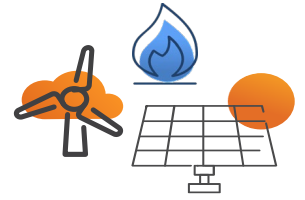


- **Current Activities**

- Refining and beginning to implement the internal and external stakeholder plan
- Initiating multi-sectoral modeling
- Gathering financial and production data for OPPD's existing assets
- Identifying and selecting members of the External Oversight Committee

- **Upcoming Activities**

- Stakeholder Workshop #1: Decarbonization Pathways Planning 101
- Developing screening methodology for technologies
- Characterize key risks for portfolio resiliency analysis



Decarbonization: Outreach



Pathways to Decarbonization – Discovery Sessions

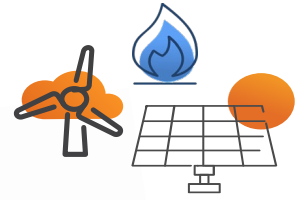
December 2020 – January 2021

Objective:

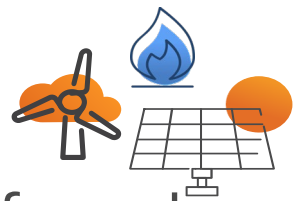
- Listen to stakeholders about how they want to be involved.
- IAP2 Level - Collaborate

Outcome:

- Understand what success looks like to them
- Use input to help shape the outreach plan and create higher satisfaction with the process.
- Create advocates to help carry the message.



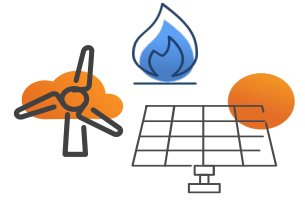
Discovery Session Takeaways



- Tend to feel blind-sided – need upfront communication, time to digest info and provide input before final decisions
- Recognize need for “layered” approach – understanding that all stakeholders are not engaged at same level, including their own membership
- Lean on them, help them translate technical info to their orgs, and provide shareable information (i.e. newsletter & social media copy, infographic, etc.)
- Transparency in how feedback was used or not used, assumptions made behind the decisions, and timeline relative to decision points (loop back)
- Feedback – be clear on what we’re seeking from them
- Utilize new and “outside the box” communication tactics (i.e. text messaging, board member social media communications, Nextdoor app)
- OPPD doing better than most utilities at engagement and accessibility of information
- Appreciated the opportunity to be engaged early in the process

Key Takeaway – Workshop #1

Decarbonization Pathways Planning 101



April 7th

Objective:

- Education and general overview of the project process, timeline and objectives.
- Gather stakeholder feedback on objectives, process, and timeline.
- IAP2 Level - Involve

Outcome:

- Demonstrate OPPD's incorporation of listening session feedback.
- Gather stakeholder input on process, timeline, objectives.
- Provide transparency on process and future opportunities for input.



Join us on the journey!

**Connect with us at
OPPDCommunityConnect.com**