

Port Charging and Fueling Infrastructure



Working Group Meeting
November 15, 2024
GB Conference Room

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Agenda



Background



Current Port Charging and Fueling Infrastructure Efforts & Observed Gaps



Preliminary Concept for Port Charging and Fueling Infrastructure Planning



Next Steps



Discussion

Background

- ❑ South Coast AQMD has been pursuing a potential facility-based measure for ports since adoption of 2016 AQMP
- ❑ Ports are the largest source of NO_x in South Coast Air Basin
 - Emissions have been significantly reduced from port-related sources since 2005
- ❑ Attaining federal and state air quality standards is not possible without substantial additional reductions from port-related sources

Stakeholders' Feedback

- Ongoing stakeholder engagement on mechanisms to facilitate clean port operations
 - Including a series of technical working group meetings in early 2024
- Key takeaways thus far:
 - **Energy transition** critical to meeting the many private and public sector zero emission goals at the local, state, federal, and international level*
 - **Charging and fueling infrastructure planning and development** urgently needed to deploy clean technologies
 - **Multi-entity coordination** key to addressing infrastructure challenges

Port of LONG BEACH THE PORT OF CHOICE

News Release

Hydrogen Era Dawns at San Pedro Bay Ports Complex
Up to \$1.2 billion federal grant will help power supply chain's zero-emissions future

Oct. 13, 2023

Study reveals future demand for green fuels along Singapore-LA-Long Beach corridor

LAist

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CLIMATE AND ENVIRONMENT

More electric trucks, more charging stations, but challenges remain

By [Erin Stone](#)
Published Oct 28, 2024 5:00 AM

energy demand
2050.

Refrigeration

LA THE PORT OF LOS ANGELES

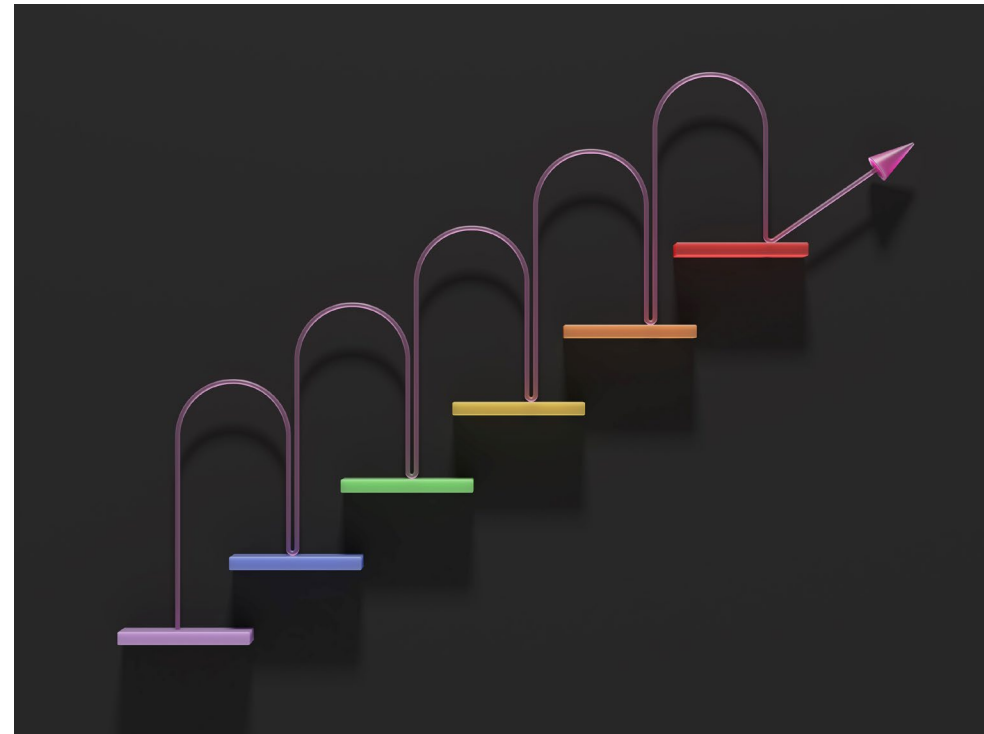
NEWS RELEASE

PORT OF LOS ANGELES AWARDED \$412 MILLION GRANT FROM U.S. EPA FOR ZERO-EMISSION TRANSFORMATION

* Some focus on net-zero greenhouse gases (GHG) while others on zero tailpipe emissions of all air pollutants.

Staff's Current Approach

- ❑ Exploring an incremental approach
- ❑ Start with infrastructure planning
 - Infrastructure is foundational to achieving future emission reductions
 - Tied to zero emission goals for 2030-2050 in concurrent initiatives



Working Group Meeting Focus

*Today's discussion will focus on **preliminary concepts to enhance progress toward clean port charging and fueling infrastructure***

Current Gaps & Opportunities

- Observed in current infrastructure planning and implementation efforts at Ports

Enhanced Planning Approach

- Addressing current gaps
- Maximizing potential opportunities

Potential Elements of Enhanced Approach

- Facilitating successful implementation

Multi-Level Port-Related Initiatives

- Many concurrent initiatives* applicable to different segments of port operations
- Each has its set of zero emission goals

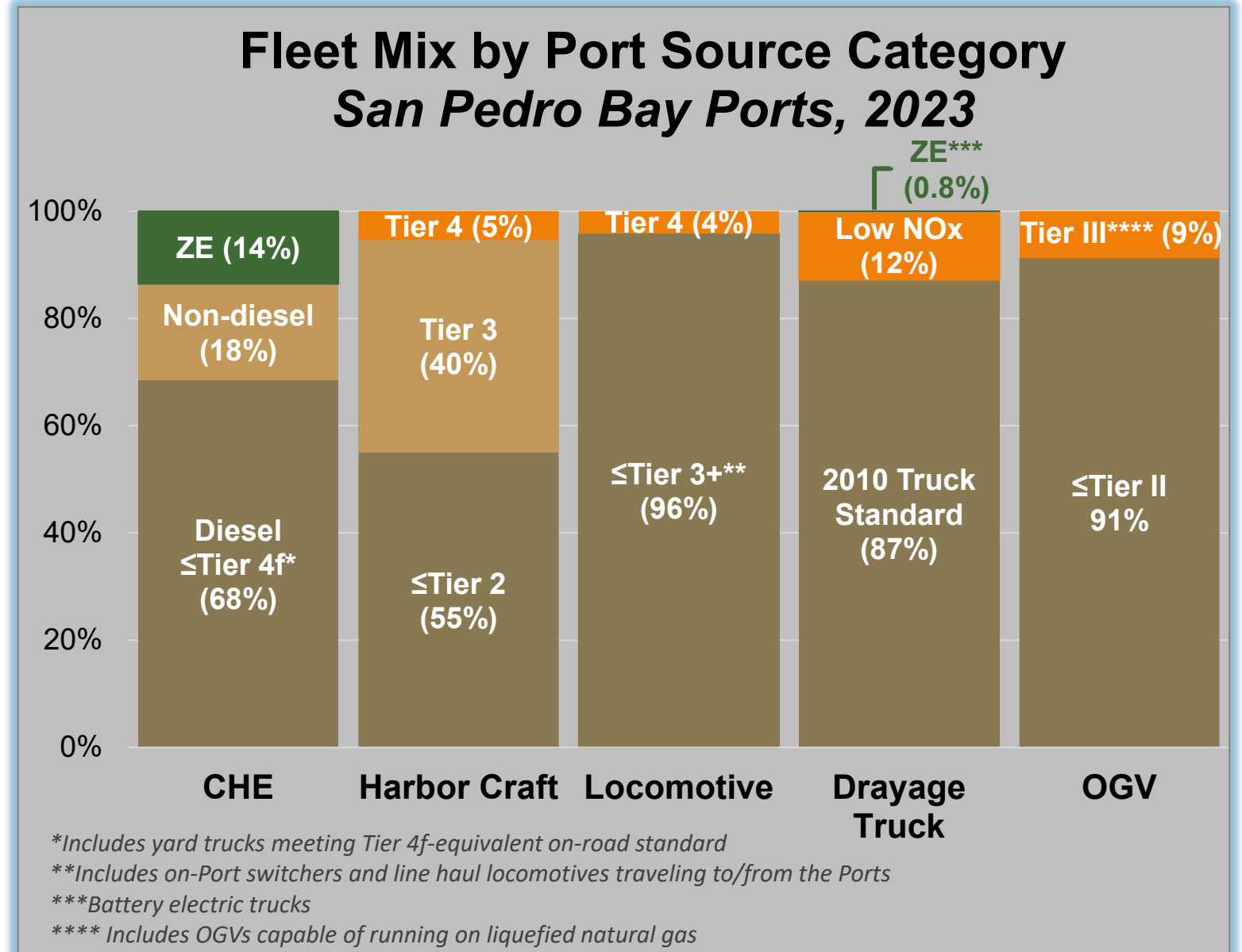


* Not an exhaustive list

** GHG-focused

Infrastructure Challenges

- ❑ Significant effort still needed to deploy alternative energies among today's port fleets
- ❑ Alternative fueling infrastructure is not widely available
- ❑ Infrastructure efforts are not coordinated across each initiative



Data sources: 2023 POLA & POLB Emission Inventories

Ports-Related Infrastructure Planning Efforts – Assessments

	Assessments & Studies	Port Source Category
POLA	Zero-Emission Planning and Grid Assessment at the Port of Los Angeles (2023)	Cargo handling equipment (CHE) at container terminals
POLB	Assessing Reliability and Resilience of Power Systems at the Port of Long Beach (2022)	CHE, Ocean going vessel (OGV) At-Berth
	Assessment of Public Truck Charging and Fueling Near the Port of Long Beach (2021)	Trucks
	CEC ZE Terminal Equipment Transition Project (2024) (<i>technology demonstration</i>)	Trucks, CHE
POLA & POLB	CAAP Feasibility Assessment for Drayage Trucks (2023)	Trucks
	CAAP Feasibility Assessment for CHE (2022)	CHE
	Electrification of California Ports Study (2021)	Trucks, CHE, OGV At-Berth
	Initial Study Supporting LA/LB to Singapore Shipping Corridor Development (2024)	OGV Transit

Gaps Observed:

- ❑ No port-wide assessment that includes all port sources
 - No recent assessment for certain source categories (e.g., locomotives)
 - Energy demand for individual source categories not consistently addressed
 - Aggregate energy demand not fully understood
 - Energy supply to meet demand unknown
- ❑ Workforce impacts not assessed
- ❑ Funding approach not clear

Port-Related Infrastructure Planning Efforts – Public Grants

Gaps Observed:

	Project & Supporting Grant(s)	Port Source Category with Funding Allocated to Infrastructure
POLA	US EPA Clean Ports Program (2024) <i>ZE CHE Purchasing, Charging Infrastructure, and Drayage Trucks Deployment</i>	CHE
POLB	CalSTA Port and Freight Infrastructure Program (2023) <i>System-Wide Investment in Freight Transport (SWIFT)</i>	CHE, OGV At-Berth, (Locomotives?)
POLA & POLB	US DOT Federal Railroad Administration Consolidated Rail Infrastructure and Safety Improvements (CRISI) Program (2024) – awarded to CARB	On-Port Switch Locomotives
	US DOE Regional Clean Hydrogen Hubs (H2Hubs) Program (2023) – awarded to ARCHES	Trucks, CHE
	US EPA Inflation Reduction Act (2022) Climate Pollution Reduction Grants – awarded to South Coast AQMD	Trucks, Locomotives
	State Incentive Programs for Infrastructure (<i>e.g., EnerglIZE, Carl Moyer, LCFS, etc.</i>)	<i>Program Specific</i>

- ❑ Historic amount of public grants going to port projects, but allocation for infrastructure not always clear
- ❑ Often awarded to shovel-ready projects but not longer-term planning efforts, due to nature of public grants
- ❑ Total costs at project- and port-wide levels unclear
 - Total funding needs will exceed funding through public grants (and their matching funds)

Port-Related Infrastructure Planning Efforts – Other Projects and Initiatives

	Other Projects and Initiatives	Port Source Category Supported by Related Infrastructure Development
POLA	Terminal-specific improvement projects <i>(in various development stages)</i>	CHE, OGV At-Berth
POLB	Terminal-specific ZE development projects <i>(in various development stages)</i>	CHE, OGV At-Berth
	Zero Emissions, Energy Resilient Operations (ZEERO) Policy	<i>Not fully specified, potentially multiple categories</i>
	On-Port Charging Depots for Drayage Trucks	Trucks
POLA & POLB	Green Shipping Corridors <i>(with Shanghai and Singapore, respectively)</i>	OGV <i>potentially all operating modes</i>
	Ports' Co-Funded Regional Charging Depots for Drayage Trucks	Trucks
	Ports' Joint Technology Advancement Program <i>(available for infrastructure as part of technology demonstration)</i>	<i>Project specific</i>

Gaps Observed:

- ❑ Unclear how each project / initiative fits into context of multi-level zero emission goals
 - Tend to have limited scope
- ❑ Unclear delineation of processes, roles, and responsibilities
- ❑ Separate planning efforts have the potential to be duplicative and less-efficient

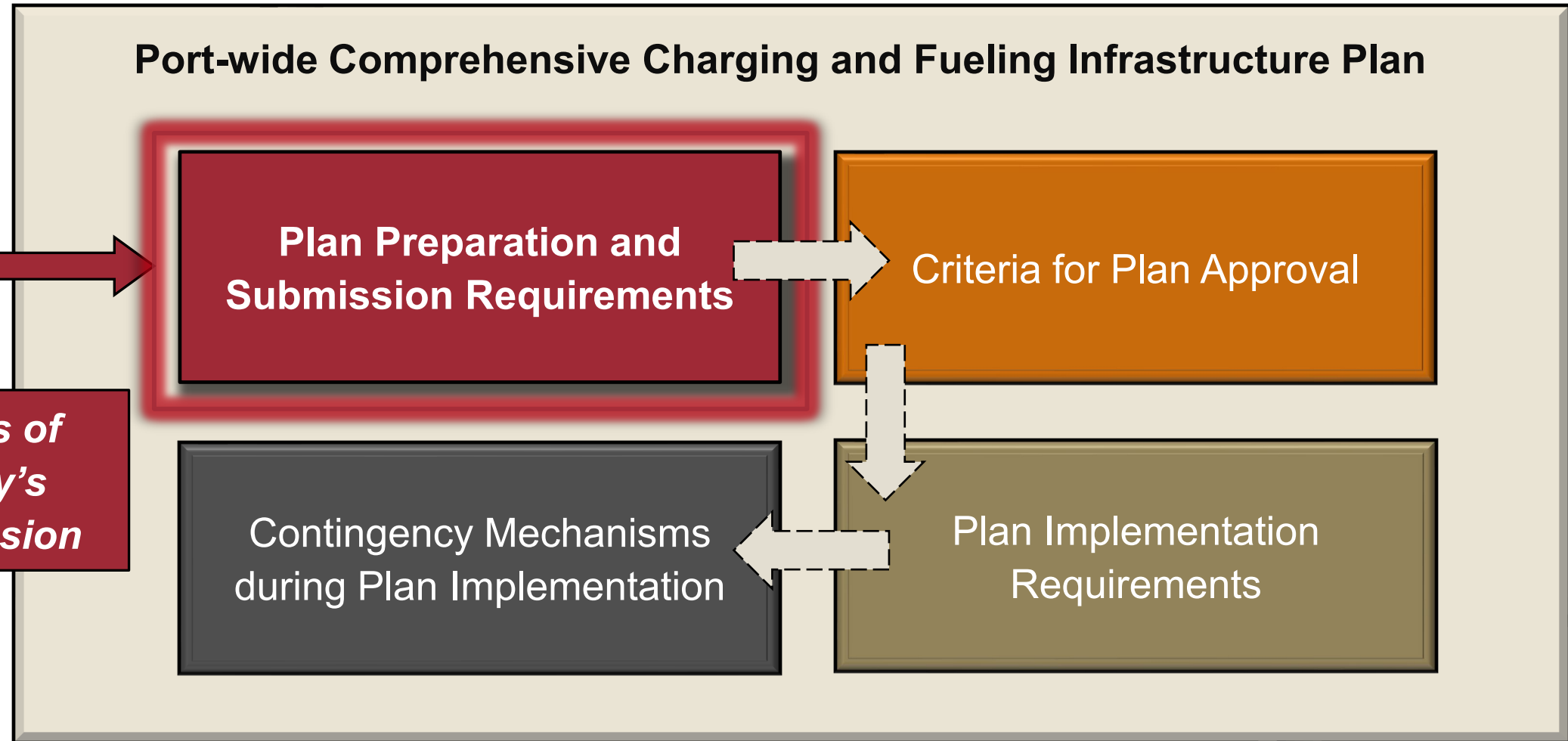
Greatest Opportunity for Early Success

- Addressing gaps in infrastructure planning stage would help implementation to happen as quickly and smoothly as possible

Preliminary Concept: Each port would develop a **Port-wide Comprehensive Charging and Fueling Infrastructure Plan** to:

- Facilitate a holistic and transparent planning approach
- Coordinate planning efforts with concurrent multi-level initiatives
- Reduce redundancies and increase scalability
- Provide overall funding needs assessment to strategically leverage public grants and identify other potential revenues
- Better streamline and standardize processes

Potential Structure of Preliminary Concept



Potential structure is applicable to any specific framework.

Key Considerations for Plan Requirements



Add value to current efforts

- Establish reasonable expectation of processes, timeline, and scale of demand vs. supply
- Help align infrastructure and vehicle/equipment/vessel deployment in context of multi-level zero emission goals
- Provide more certainty to energy suppliers, infrastructure developers, and port end-users



Recognize that it takes joint action

- Port-wide planning needs input from port tenants and other stakeholders
- Infrastructure development involves different responsible parties at various stages

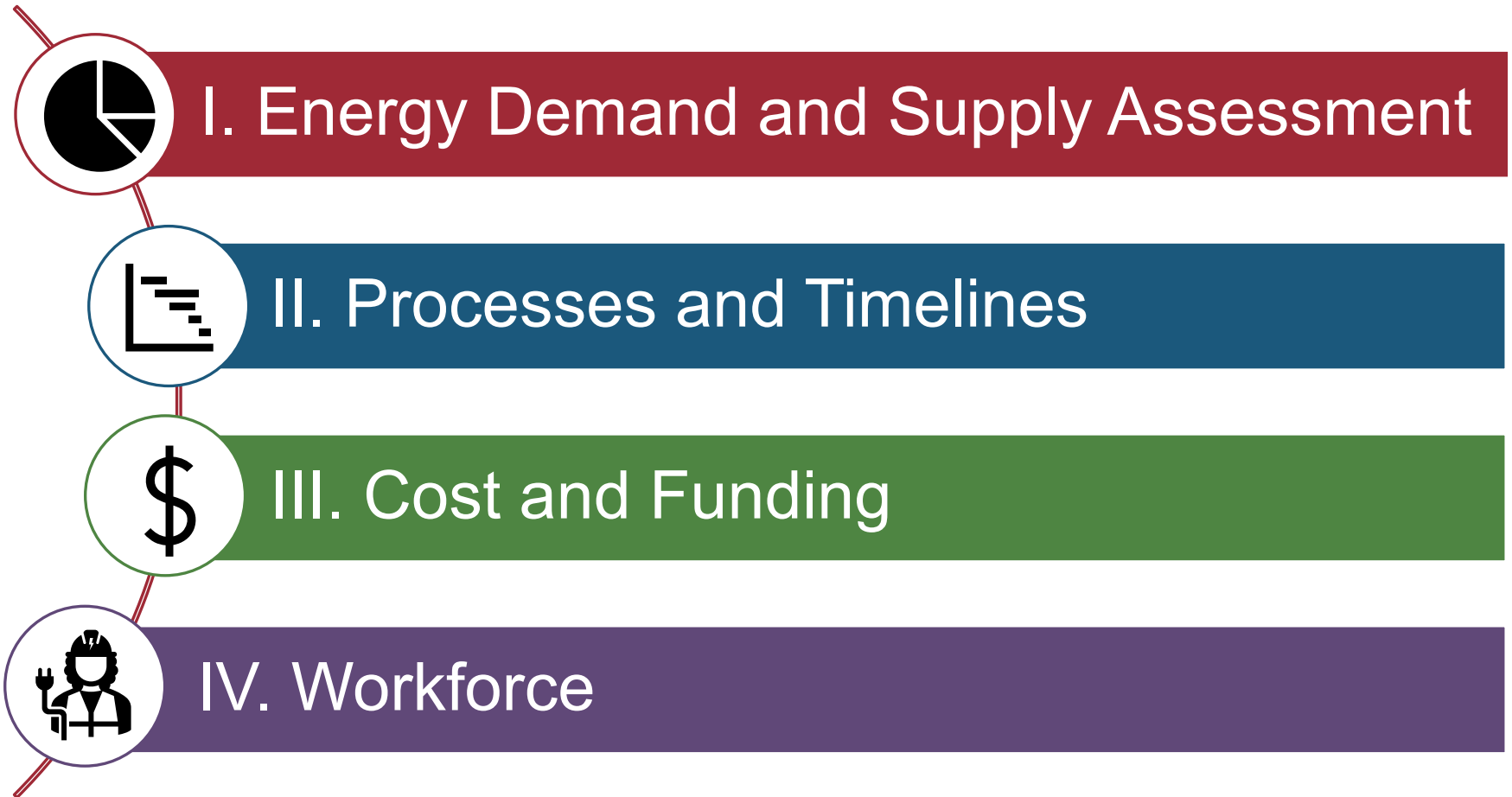


Recognize plan may need to be updated on a case-by-case basis

- Initial plan followed by periodic updates as understanding matures and uncertainties decrease
- Planned processes and timelines may initially differ in specificity and detail by energy type and port emission source

Port-wide Comprehensive Charging and Fueling Infrastructure Plan Conceptual Elements

Scope covers
all emission
sources and
energy types



Part I. Energy Demand and Supply Assessment

□ Key Areas of Assessment:

1 Demand Aggregation by Energy Type <ul style="list-style-type: none">• Across all emission sources port-wide• How much is needed by when to meet ZE goals	3 Capacity of Energy Supply <ul style="list-style-type: none">• Current capacity & additional capacity already underway• How much more is needed by when to meet ZE goals	5 Reliability and Redundancy <ul style="list-style-type: none">• How they impact energy demand and supply planning
2 Multiple Scenarios <ul style="list-style-type: none">• Technological pathways• Interim solutions• Supply ramp-up schedules• Other uncertainties	4 Capacity Building <ul style="list-style-type: none">• How to address anticipated supply shortfalls?<ul style="list-style-type: none">• Generation,• Distribution, and/or• Storage	6 On/Off-Port Infrastructure <ul style="list-style-type: none">• Distinguish components located on/off port property• Identify off-port components ports need to consider

Determine a “Preferred Scenario” for further infrastructure planning

Energy Demand and Supply Assessment – Electrification Example

1 Demand Aggregation by Energy Type

- For emission sources to be *electrified**, estimate port-wide peak demand (MW) and annual demand (MWh) to meet**:
 - 100% ZE CHE by 2030
 - 100% ZE Drayage Trucks by 2035
 - Net-zero GHG in 2050

2 Multiple Scenarios

- Range of peak demand and associated annual demand resulting from multiple feasible scenarios, for example:
 - Varying technological pathways resulting in more/less electricity demand

3 Capacity of Energy Supply

- Determine current and anticipated port-wide electrical capacity (MW/MWh)
- Based on estimates in **2**, determine MW/MWh shortfalls

4 Capacity Building

- Determine how to expand electrical capacity if foreseeing shortfalls, for example:
 - # and type of substations, transformers, circuits, etc. to be installed

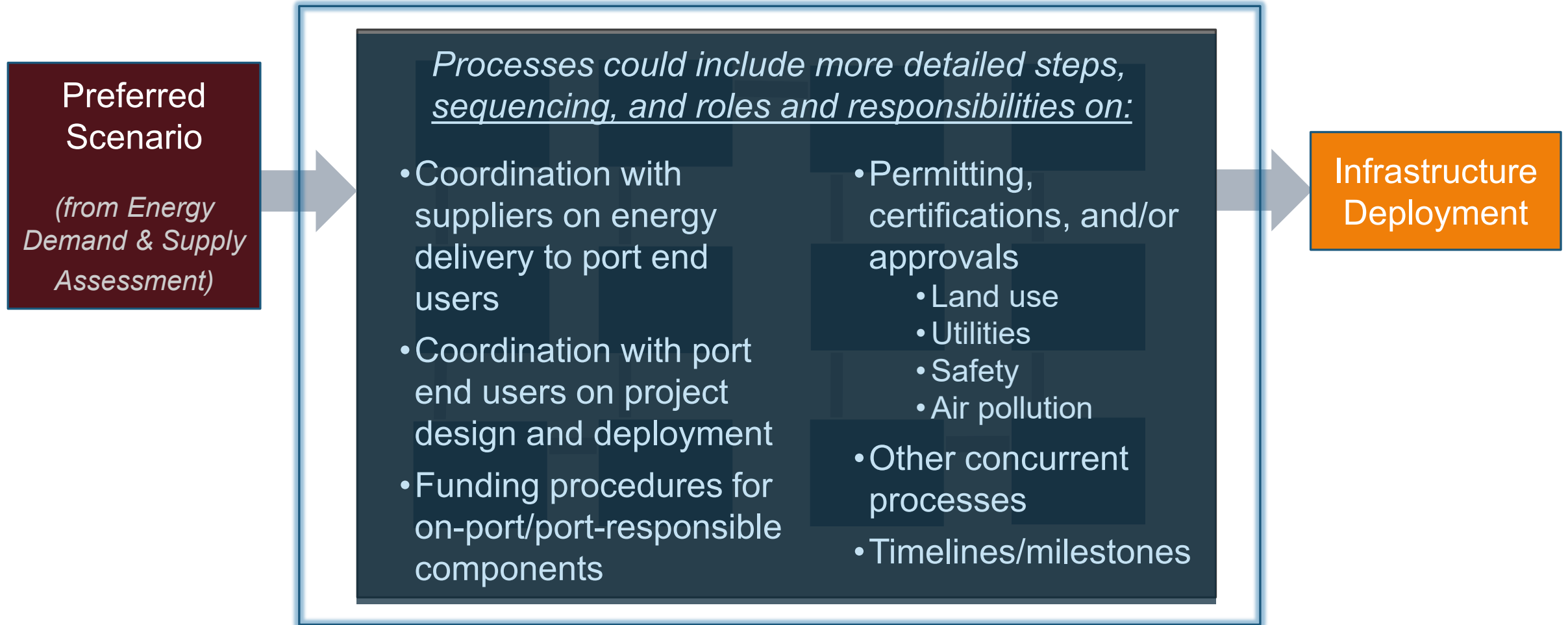
5 Reliability and Redundancy

- Evaluate strategies to address grid reliability concerns:
 - On/near-port microgrid
 - On/near-port battery farm
 - Operational peak shaving strategies

6 On/Off-Port Infrastructure

- Determine ports' role(s) in electrical capacity building and implementing grid reliability / redundancy strategies
 - As a landlord
 - As an end-user
 - As a land use authority

Part II. Processes and Timelines



Processes and Timelines* - Alternative Fuel Bunkering Example

<i>Processes to build an on-port alternative fuel bunkering facility for marine vessels**</i>	Timeline					
	20XX	20XX	20XX	20XX	20XX	20XX
Engagement and information gathering: - Fuel suppliers - Vessel operators - Bunkering service providers	Active	Active	Active			
Site identification and various assessments (e.g., engineering, environmental, etc.)		Active	Active			
Prepare and submit grant applications and/or set up revenue generation mechanism		Active	Active	Active		
Obtain applicable permits, environmental clearances, certifications, and approvals from, for example: - U.S. Coast Guard - Classification society (e.g., bunkering barge) - Ports/cities, etc.			Active	Active		
Construction of bunkering facility					Active	
Bunkering facility ready to dispense fuel						Active

* If new requirements are developed after plan submittal (e.g., by IMO, etc.), then the plan may be revised

** High-level conceptual process chart shown for illustrative purposes only

Part III. Costs and Funding

Estimating Costs

- Port- and tenant-borne costs (without external funding)
- Breakdown of major cost components
- Estimation methodology and basis

Identifying Funding Sources

- Existing and anticipated public grants
- Existing revenue stream (e.g. Clean Truck Fees)
- Identified cost-share amounts

Addressing Any Funding Deficiencies

- Identify deficiencies in funding per estimated costs
- Identify potential funding / revenue generation mechanisms to fill deficiency

Potential Restrictions

- If pursuing incentive or grant funding, determine potential restrictions in applications
- If restrictions apply, propose alternative funding mechanisms or scenarios

Part IV. Workforce



- Assess potential workforce impacts
 - Infrastructure development & equipment operation
 - Training / retraining needs
 - Type of work and number of jobs
- Workforce planning
 - Transition / development program(s)
 - Program partner(s)
 - Roles and responsibilities in program funding and implementation

Next Steps



Follow up on feedback received

- Hold additional meetings as necessary



Continue stakeholder engagement



Provide update to Governing Board in January 2025



Anticipated Public Hearing for Board Consideration for Adoption in June 2025

Open Discussion

Are there any questions on the preliminary concepts presented today?

Are there additional considerations staff should take into account in the proposed overall planning approach?

Are there additional considerations for the four planning elements that are not addressed in the presentation?

Are there any other elements that should be included in the port-wide comprehensive infrastructure plan?

Staff Contacts

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