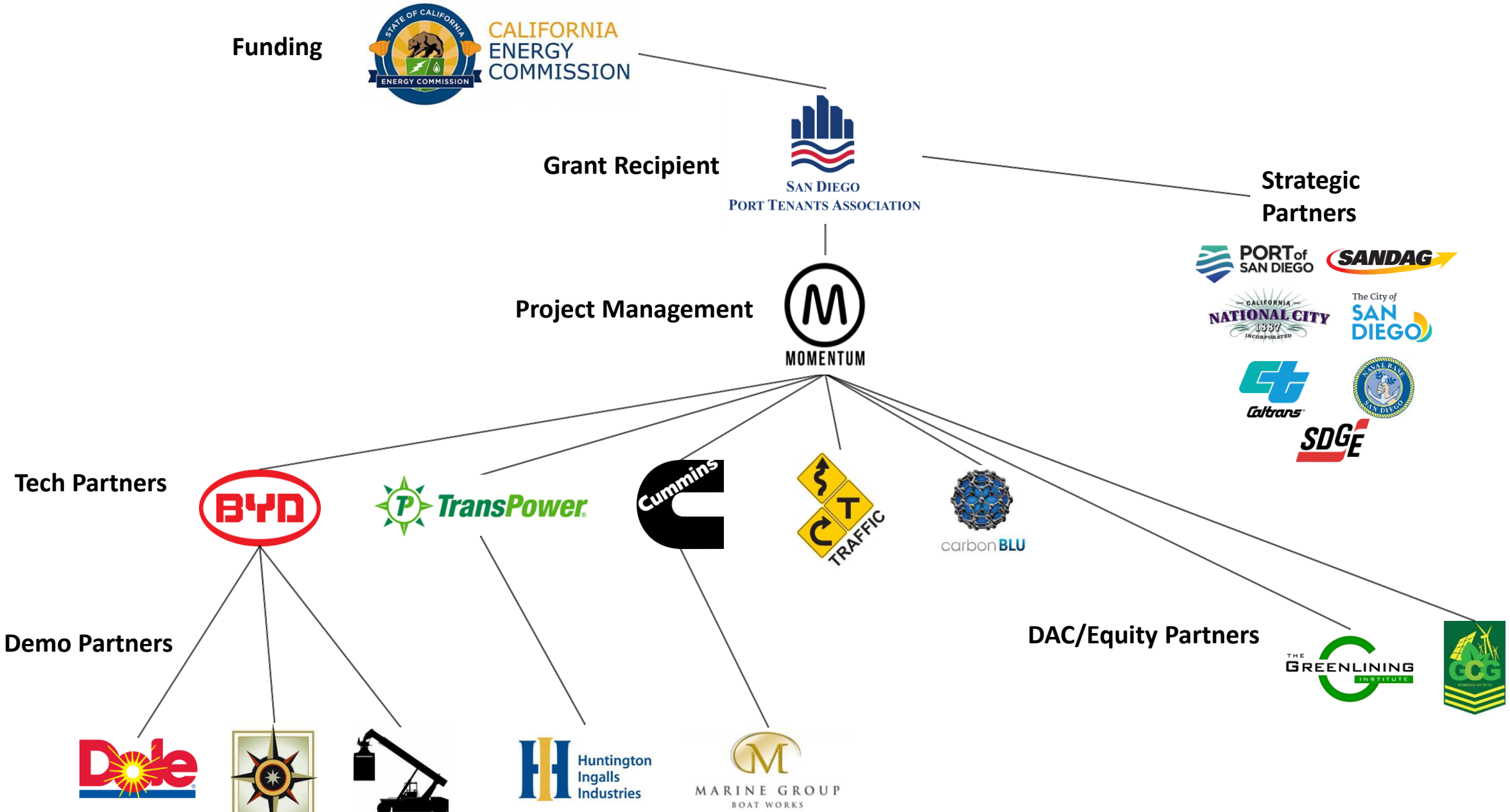
California Energy Commission
Grant Agreement ARV-15-068

Port of San Diego Sustainable Freight Demonstration Project

SAN DIEGO PORT TENANTS ASSOCIATION


Funding
CALIFORNIA ENERGY COMMISSION
Grant Recipient
SAN DIEGO PORT TENANTS ASSOCIATION
Strategic Partners
PORT of SAN DIEGO
SANDAG
CALIFORNIA NATIONAL CITY 1887 INCORPORATED
The City of SAN DIEGO
Caltrans
SAN DIEGO BAY
SDGE
Project Management
MOMENTUM
Tech Partners
BYD
TransPower
Cummins
TRAFFIC
carbonBLU
Demo Partners
Dole
PASHA
TERMINALIFT
Huntington Ingalls Industries
MARINE GROUP BOAT WORKS
DAC/Equity Partners
THE GREENLINING INSTITUTE
GCG

VIDEO LINK

Common Concerns with EV Technology in Port / Shipyard Operations

Sufficient Battery Capacity

- Operations require equipment to be able to operate for consecutive shifts without interruption
- Down time for charging can cost time, money, and lost business

Power and Performance

- Steep grades are common in port and shipyard operations
- Can affect speed, hauling capacity, and significant battery drain or lack of power to perform necessary tasks

Durability

- Port/shipyard equipment is exposed to the elements year-round
- Heat and humidity can negatively impact battery life and longevity

Design

- Visibility, ground clearance, and maneuverability may be significantly different from conventional equipment
- Consequences of design adaptations may not be realized until put into real world use

Lack of existing infrastructure

- Charging is not yet standardized across EV MDHD equipment
- Adopting EVs often requires also developing the infrastructure
- Can include considerable costs and time investment for permitting and construction

Case Study: BYD Drayage Electric Drayage Truck

1st Generation

VS

2nd Generation

One drayage shift at Pasha requires 4 to 5 non-stop, round trips between the Port and Otay-Mesa (approximately 36 miles per round trip)

- Requires charging after 1 round trip.
- Cannot maintain the minimum speed limit when going up hill on a sustained grade
- If incorporated into a shift would require detaching the trailer and transferring to a second vehicle (increasing downtime significantly)

- Significant improvement to the battery performance
- Easily maintains speed going up hill on a sustained grade with an empty trailer; some speed loss with full trailer but still within safety parameters
- Performs a full shift without opportunity charging
- Two 2nd Gen trucks are now also being demonstrated at Terminalift with great results

Case Study: BYD Electric Yard Tractor

Dole Demonstration

Design Function Issues

- Back window design smaller than preferred for good visibility with sliding rather than rolling design
- Driver chair positioned slightly too high for visibility
- Passenger side mirror too large and gets continuously bumped
- 5th wheel stopped lower than the height of the rails

Design Modifications

- Alternative windows, chairs, and mirrors were identified and replaced in the demonstration vehicles
- Stoppers and additional reinforcement were added to correct the 5th wheel issue

Result

- Yard tractors have been operating successfully as planned at Dole
- All identified issues were resolved in the 2nd Generation model design

Pasha Demonstration

Design Function Issues

- Driver seat and steering column not able to swivel (necessary safe operations during Pasha cargo movements on and off ship)
- 5th wheel not able to be lowered while in drive (must be in park)
    - Necessary for safe operation on ramps during ship loading/unloading

Design Modifications

- Design changes were fully investigated
- Deemed too expensive to re-design for one vehicle

Result

- Yard tractor was reassigned to yard movements only

Stakeholder Thoughts on the EV Tipping Point for Ports / Shipyards

- … if it outperforms what we have today at equal cost, or has the same performance at lower cost, it will be a “no-brainer” to go electric.
- … we can manage the cost and complexity of installing the charging infrastructure (including access to power) at scale.
- … the price comes down, including the first cost for the truck.
- … demonstrations successfully build confidence in these pieces of equipment and their performance.
- … initial partners, who have been willing to take this risk, are successful.
- … it’s proven to be a viable industry, and it doesn’t slow down operations.
- … it’s proven to be worth investing in.

SAN DIEGO PORT SUSTAINABLE FREIGHT DEMO AND EQUITY PLAN

EQUITY ANALYSIS FINDINGS

- No clear definition of equity or target audience.
- Requirement to benefit DACs, but there is a need for more specific and robust details in describing how policy or project will achieve strong equity outcomes.
- More direction and guidance needed on how to achieve equity in process, implementation, and analysis of environmental, health, economic, and community engagement initiatives targeted at impacted port communities.

EQUITY RECOMMENDATIONS

GOALS, VISION AND VALUES

- Create a Port of San Diego DAC advisory group that will involve community decisions on which grants to pursue, identify targeted DAC community, in effort to make equity a clear goal in the Port's efforts to be zero-emission.

- The Port of San Diego DAC advisory group will provide guidance on how to achieve equity in process, implementation, and analysis of environmental, health, economic, and community engagement initiatives targeted at impacted port communities.

EQUITY RECOMMENDATIONS

PROCESS & IMPLEMENTATION

- Based on Port of San Diego Advisory group recommendations, collectively design an equity plan, into the overall planning, design, create measurable outcomes, and community engagement process.
- Promote meaningful community engagement.
- Promote community power and governance.
- Design port project applications and review processes that center equity.
- Provide economic benefits to low-income people of color, individuals with barriers to employment, veterans, diverse-owned small businesses, particularly minority-owned businesses.

EQUITY RECOMMENDATIONS

MEASUREMENT AND ANALYSIS

- Improve equity outcomes through ongoing evaluation.
- Collect and report data on intended equity outcomes.
- Have ability to analyze, learn, adjust, and communicate equity outcomes.