

# Cargo Optimization and The Cold Chain

## Power Solutions for Refrigerated Transport

*“Power Pool Plus is the World Leader in the Manufacture of Power Solutions  
to the Refrigerated Transport Industry Since 1990.”*

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# **Cargo Optimization and The Cold Chain**

## **Power Solutions for Refrigerated Transport**

### **Topics of Discussion**

- **Pressures on the Cold Chain**
- **Various Power Solutions Throughout the Cold Chain**
  - *Their Advantages and Disadvantages*
- **Case Studies**



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### Market Realities

- **Panama Canal Widening** – Bigger ships adding additional pressure to the entire cold chain
- **Pressure to ‘Go Green’** – Seeking alternative fuel infrastructure to reduce carbon emissions such as; electrification.
- **Seasonal Spikes in Imports** – Forecasting production and demand and investing limited resources to meet these spikes puts continued pressure on aging infrastructure
- **Port Expansion** – Pressures to increase throughput causing infrastructure upgrades or a move to outward to inland ports.



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## Fundamental Problem Statement

*Keeping refrigerated / frozen cargo connected to reliable, affordable power, is a challenge to all partners within the Cold Chain.*

*The pressure of new construction, larger ships, and traditional seasonal spikes makes the problem even tougher to manage!*



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### Ground Power

#### Advantages:

- Once installed can be inexpensive (\$0.05 – 0.07/kW hour)
- Minimal Maintenance
- Safe with little exposed power supply

#### Disadvantages:

- Fixed Outlets – at times can never be exactly where you want them.
- Not Flexible – 300 plugs, but you need 301!
- Some regions have reliability / cost issues
- Very Expensive Installation Cost



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### Power Packs

#### Advantages:

- Very inexpensive to purchase and / or rent
- Highly flexible solution which is easily moved anywhere in the port
- Ideal for seasonal spikes and during port construction projects
- *Shipboard Capability*

#### Disadvantages:

- Fuel burn around 20 gph for 40 reefers
- Require maintenance
- All plugs (30-60) in ONE location

**Ensure a quality purchase, NOT price!**

**This machine is protecting  
YOUR COLD CHAIN!**



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## Power Solutions for Refrigerated Transport

### Clip-On / Underslung Gen Sets

#### Advantages:

- Readily available for “Grab and Go”
- Rugged construction
- Designed for reefer power
- Power exactly where its needed

#### Disadvantages:

- HIGH operating costs
  - Burns 1 gph / 40 Reefers = **40 gph!**
  - PM Service for multiple units
- VERY few manufacturers to work with
- Low fuel storage – 48 hours max.
  - Impractical for ship board use



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## Power Solutions for Refrigerated Transport

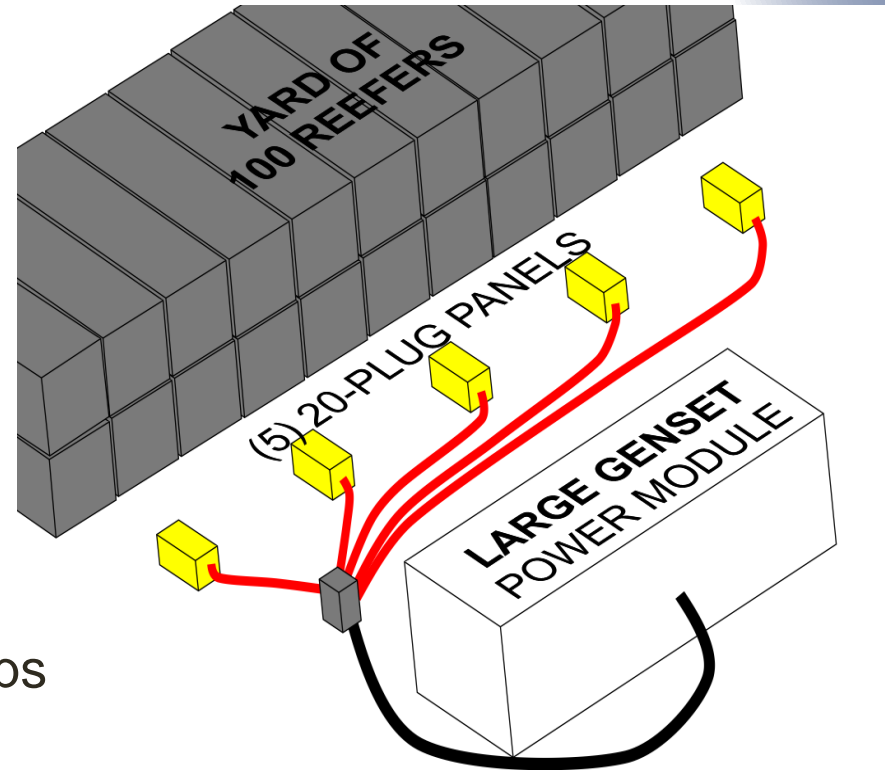
### Mobile Reefer Yard

#### Advantages:

- LOWEST operating cost per plug
  - Only 36 gph for 100 plugs
- No extension cords needed
  - Plugs can be set close to reefer stacks
- Rapid deployment

#### Disadvantages:

- Not valid for shipboard use
- Requires a load schedule that keeps the generator working at all times
- Care needed to protect cables





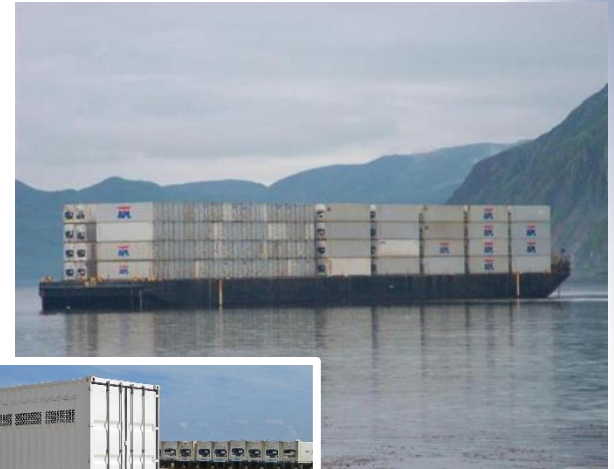
# Cargo Optimization and The Cold Chain

## Power Solutions for Refrigerated Transport

### Unique Applications

#### Case Studies Highlighting

- Barge Power
- Temporary Power During Port Expansion Projects
- Reefer Traffic Through Inland Ports



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## Power Solutions for Refrigerated Transport

### Specialized Power Solutions - Barge

- **PROBLEM:** Overcrowded port which has adjacent facility with additional available capacity. However, not cost effective to truck cargo to nearby facility.
- **SOLUTION:** Barge cargo to adjacent terminal using dual engine power pack to maintain Cold Chain during transit.
- **BENEFIT:** Operator was able to handle additional cargo, and better leverage all its available capacity.



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### Winning Contracts - Power During Construction

#### Scenario:

- Fruit producer wanted to save money by changing where its cargo was being received, potential port did not have the 300 plugs available to support the new business.
- Port needed to install 300 plugs to its terminal, however construction would take **18 months to complete!**
- Port rented Power Packs and Mobile Reefer Yards in order to meet the short term need, while permanent plugs were installed.

#### Everybody Wins:

- Fruit producer reduced its freight costs
- Port won new business without having the necessary infrastructure in place!



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### Overcrowded Ports – Reefer Power for Inland Ports

#### Scenario:

- Pressure on existing real estate at ports and terminals due to larger ships is forcing more cargo to shift inland for staging.
- Existing area for reefer allocation is limited on terminal
- Typical inland ports are nothing more than open gated yards with no infrastructure to support electrical needs for reefers.

#### Strategy

- Use untapped inland ports for reefer cargo.
- Try Power Packs/Mobile Reefer Yards as temporary solutions for inland port projects until a business model makes sense for more capital infrastructure.



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### In Summary

- Global reefer traffic is predicted to continue to grow over the next 5 years lead by the meat and exotic fruit sectors
- As reefer traffic grows, the canal expands, and new ships come on-line, the need for more reliable, cost effective, power will continue to grow and ports must be creative in moving reefer cargo and utilize all means necessary to power these loads.
- There are a variety of solutions to address this demand, each with its own advantages and disadvantages . . . One size does not fit all!

***“Reliable, cost effective power is critical to protecting YOUR valuable Cold Chain Cargo!”***



# **Cargo Optimization and The Cold Chain**

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**Thank you.**

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