



**HIGH ARCTIC**  
**ENERGY SERVICES**

## Supply Chain Security



TSX : HWO

**2023 PNG Resources & Energy Investment Conference**



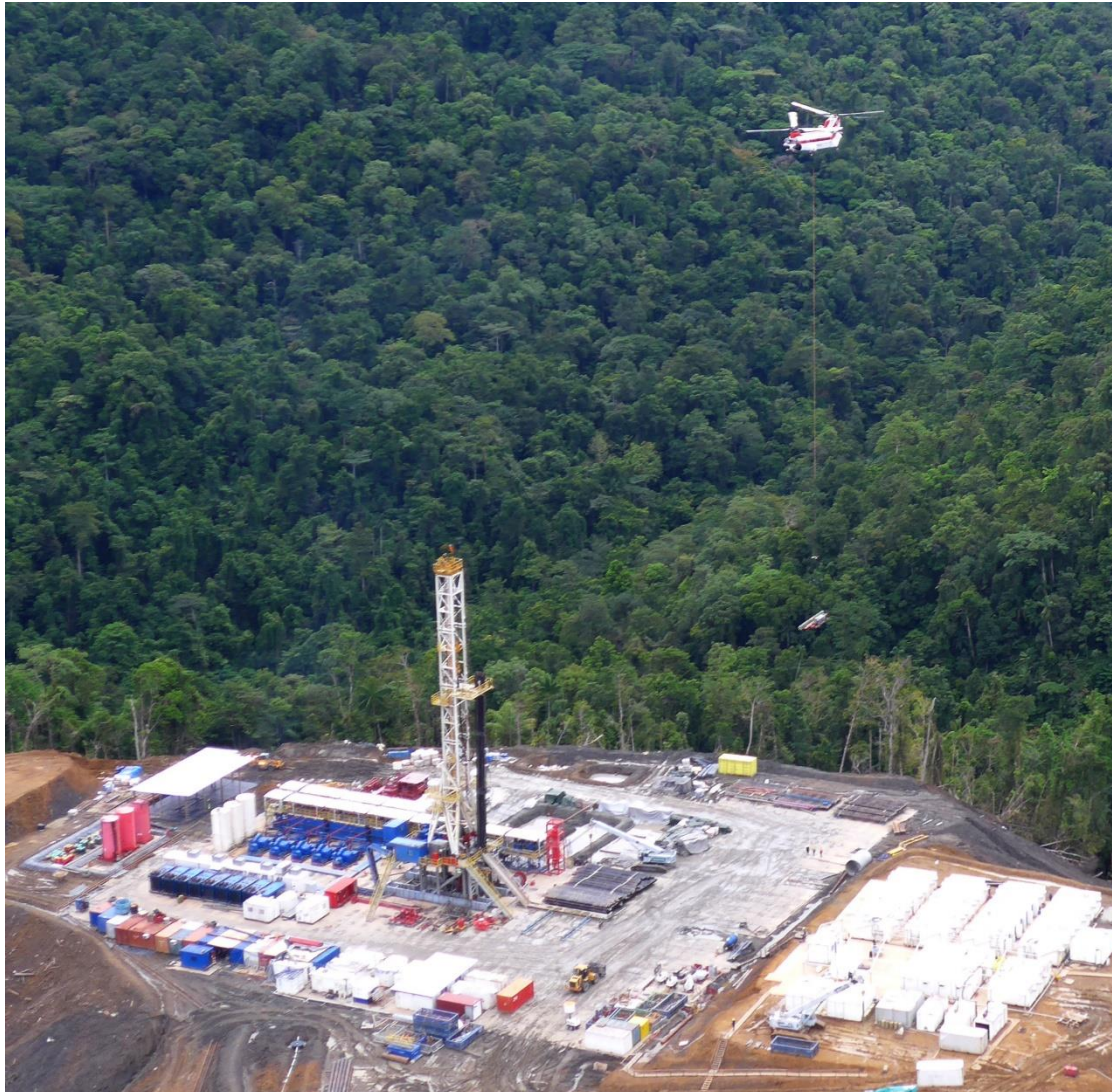


## Specialist in PNG drilling operations and logistics

- 16 Years continuous operations in PNG
- Drilling, remote equipment rentals & matting
- Global pace setter in quality outcomes
- World-leading safety performance - zero TRIF for **seven years**
- Listed on the Toronto Stock Exchange TSX:HWO



# HIGH ARCTIC'S WORLD CLASS DRILLING OPERATION



## Drilling Rigs

- Rig 115 and Rig 116
  - Tier – 1, 1500 HP, 750,000 lbs hookload
  - Highly versatile – road, light helicopter, heavy helicopter
- Rig 103
  - Tier – 1, 1500 HP, 750,000 lbs hookload
  - Road and heavy helicopter
  - Proven efficient appraisal and development rigs

## Workover Rig

- Rig 102 - 340,000 lbs small footprint hydraulic workover

“Leapfrog” rig designs substantially improve time between completion of drilling activity and start of the next well.





Rentals

- Cranes, trucks, Forklifts and other material-handling equipment
- River pumps, generators, lighting towers and assorted oilfield equipment

Worksite Matting

- Inventory exceeding 5,000 rental mats

Manpower Solutions

- Labor hire, skilled and unskilled personnel
- Training & development
- Competency assessment

Camps

- Own and manage two 103 bed Heli-portable camps
- Operate and manage two 93 bed + two 34 bed Heli- portable camps
- Smaller “Pioneer” – first deployment camps

# Technology changes markets – Markets change technology

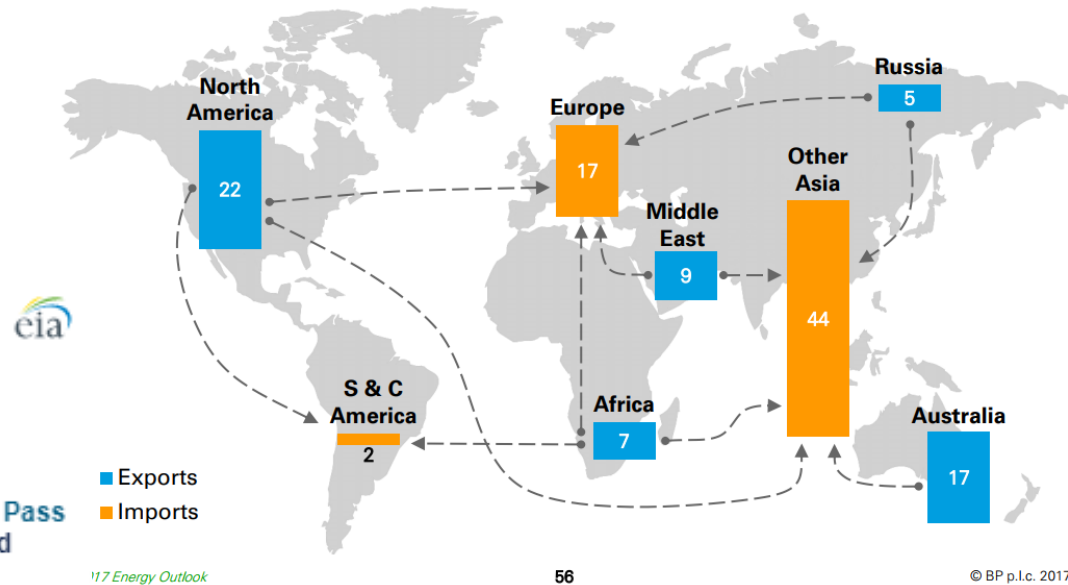
In 2015 Asian LNG and North American Shale gas were about the same volume

Key issues: LNG and global gas markets

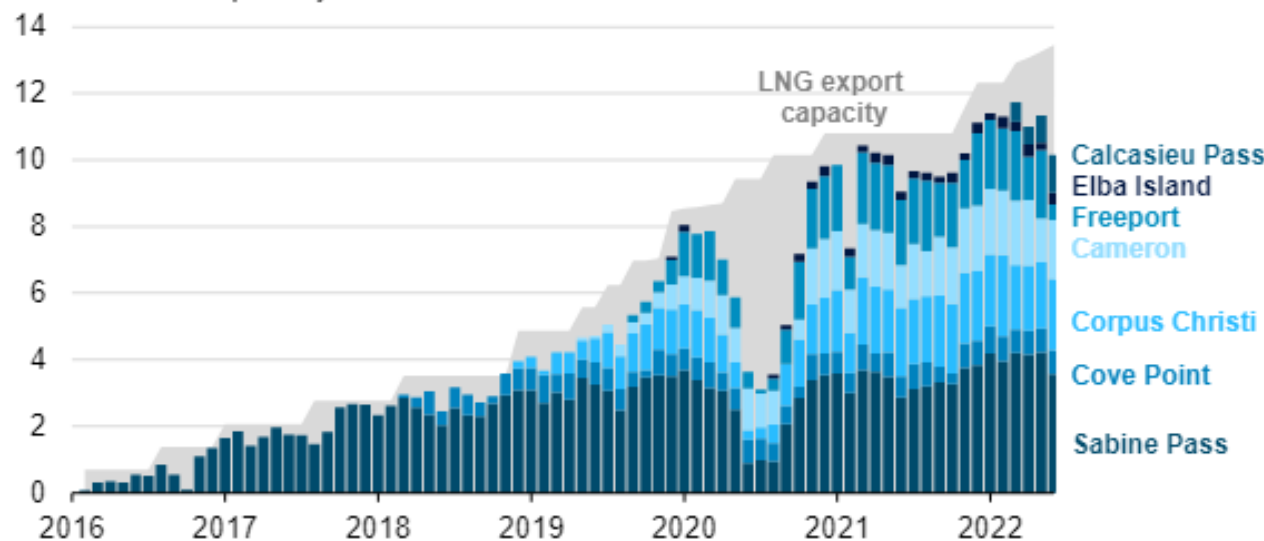
LNG's share in traded gas increases sharply...



Net LNG exports and imports 2035 (Bcf/d)



Monthly U.S. liquefied natural gas (LNG) exports (Jan 2016–Jun 2022)  
billion cubic feet per day

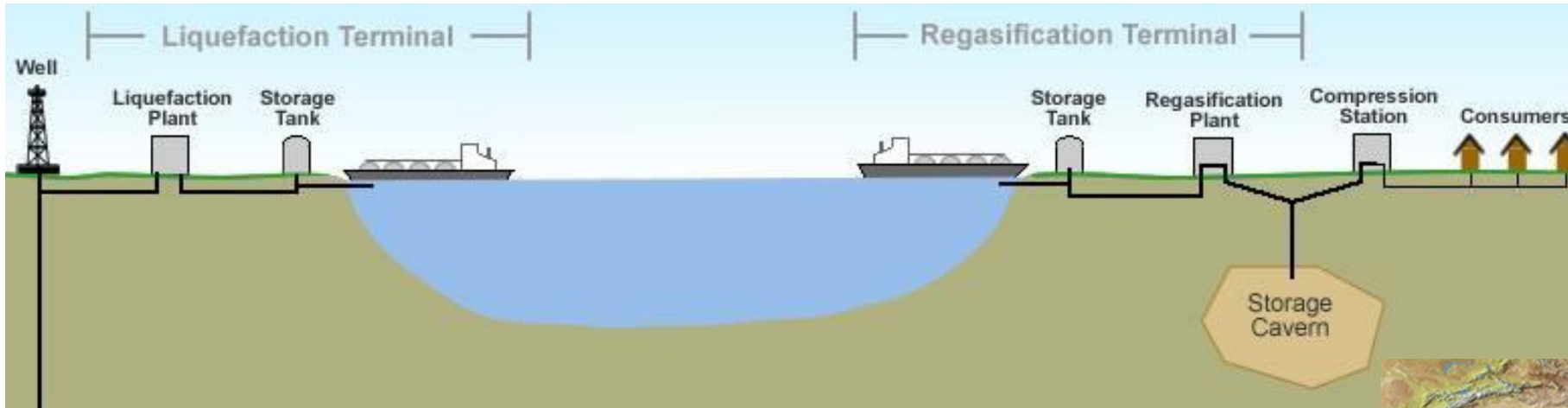


US shale gas transformed the supply chain.  
Are there lessons for PNG?

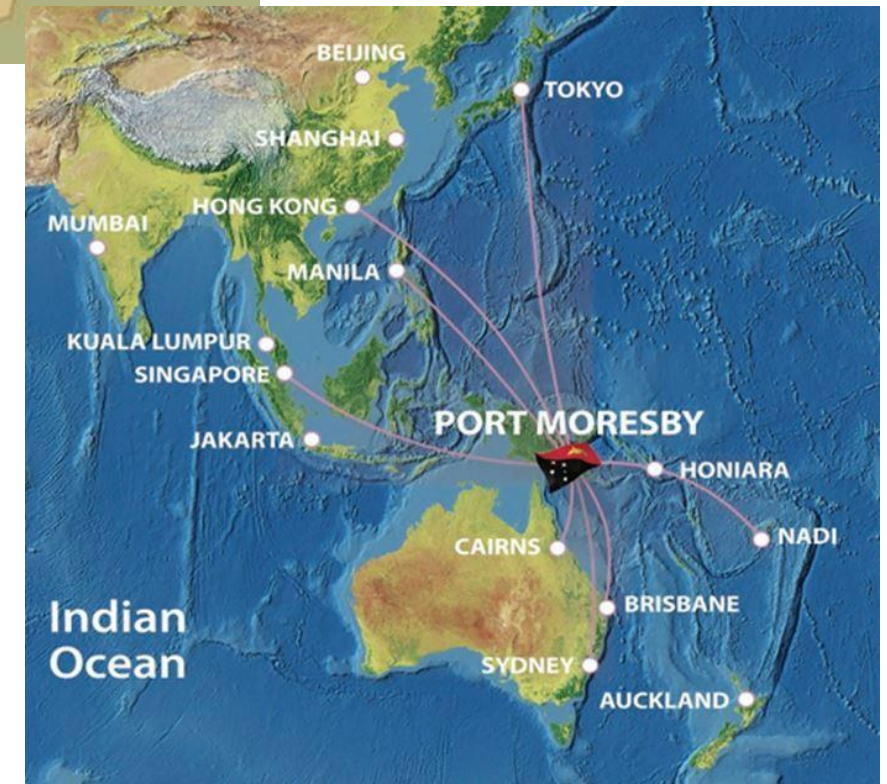
# LNG Supply Chain is long and complex



haes.ca



PNG has excelled at taking advantage of its position to supply Asian LNG





# Globally Connected by LNG

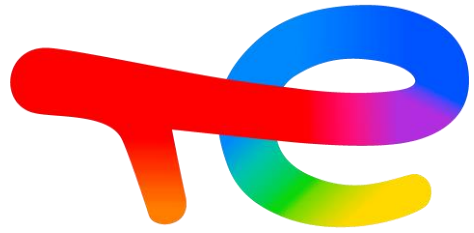


haes.ca



Opposite ends of the LNG supply chain connect people globally. People of PNG and their customers have mutual interests in each others' success, and failure means possible crisis for both.





**TotalEnergies**

**Exxon**

**Santos**



**JX Nippon Oil & Energy**



**KUMUL PETROLEUM**



**HIGH ARCTIC  
ENERGY SERVICES**



# LNG supply chain starts at the well head in PNG



haes.ca





# Just getting there is half the battle



haes.ca



PNG onshore wells are more comparable to deep marine operations than North American onshore shale gas.

It's far more about logistics in PNG

Rig costs are under 10% of well AFE in PNG verses over 30% in typical North American operations where supply chain is a standardized manufacturing style process. (PNG mob/demob and support logistics much higher)





# High Arctic - Leading edge and nimble



haes.ca

## Quality Centric Approach:

- Using quality to achieve pace setter safety record
- Made long term commitment to a local and reliable workforce
  - Kept essential services throughout the pandemic restrictions
- New technologies and services to reduce loads and increase flexibility of transport
- Deep and long experience means we know the nuances of PNG logistics
- Errors in remote operations are magnified proving the axiom ‘for the lack of a nail the kingdom can be lost’ - we have saved more than one kingdom



# Imagine a relationship - not just a contract

---

- Automotive Industry realized that they must move:

- **FROM:** The classical “adversarial” lowest price arrangement.
- **TO:** Value added supplier network using continuous improvement model.

- **FROM:** Practices which create expensive nonvalue-added work.
- **TO:** The elimination of wasteful and time-consuming practices and processes.

- **FROM:** One-way “command and control” communication.
- **TO:** Two-way participative communication.

- **FROM:** A Just Too Late Basis / Missed It Completely scenario.
- **TO:** A Just In Time / JTP basis via good robust up-front analysis / planning.

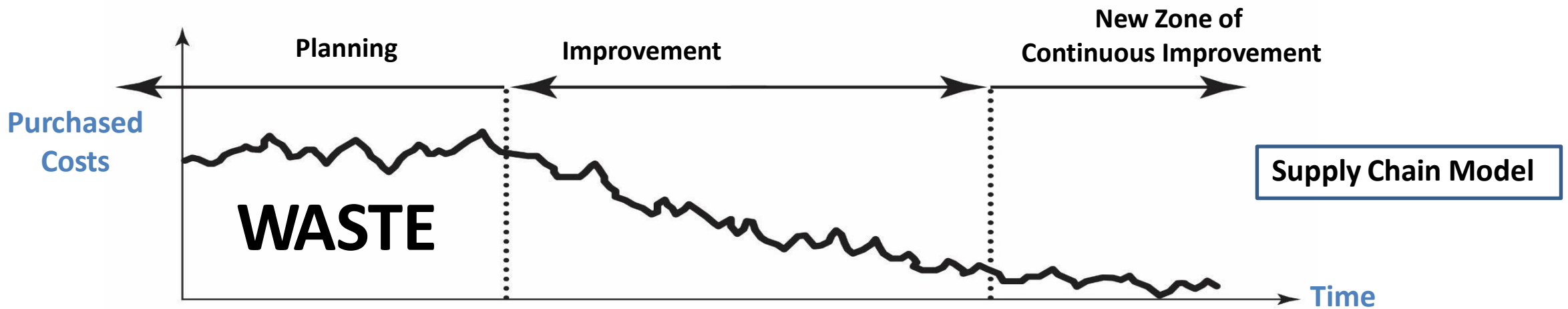
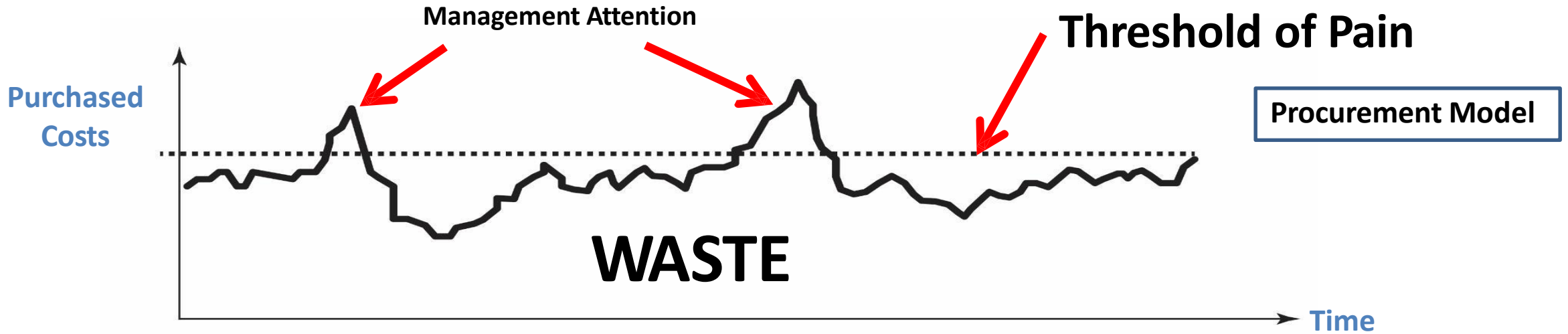
- **FROM:** Reactive “Seats of the pants” judgement process.
- **TO:** Systematic problem definition, analysis and solution procedures.



# Unlocking PNG resources –relationships drive down costs



haes.ca



# Local Involvement



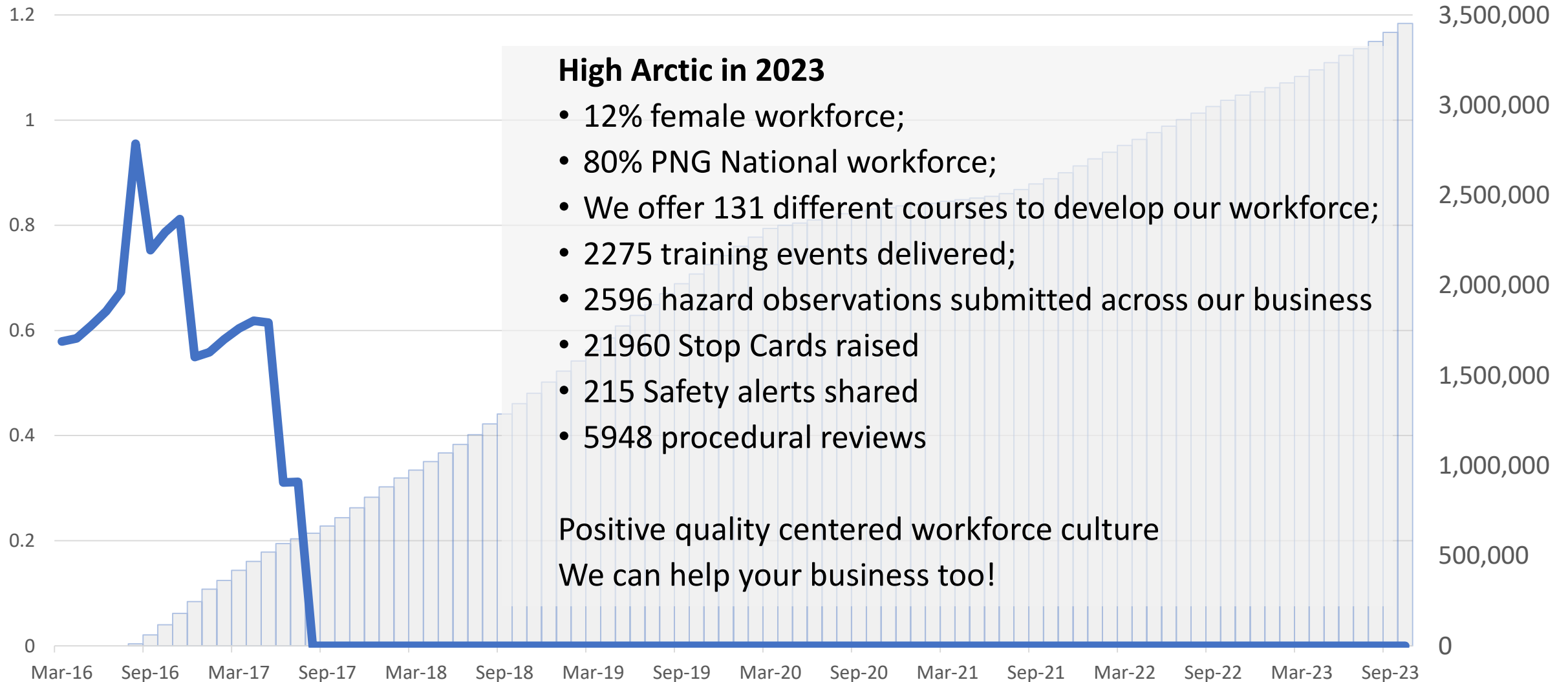


# Quality Results



## Total Recordable Incident Frequency Rate Chart

Cumulative man-hours



# Conclusion - Future Energy Success in PNG



- Its important - A lot of people depend on a successful supply chain from well head in PNG to burner tip in Japan
- Future energy investment and access requires efficiency and investor returns while maintaining ESG standards
- Success in the PNG market is dependent first and foremost on logistics efficiency and local involvement
  - nuances need experience and flexibility to prevent train wrecks
- We are committed to PNG and it's people.
- We want to collaborate and solve problems for our clients
- Create long term trusted and effective supply chain relationships
- **A continuous improvement model needs a team that continuously improves – who is on your team?**



## Achievements

- 92 Wells Drilled or Re-entered in remote PNG
- Moved over 600,000 Tonnes of plant and equipment
- In-house equipment design specialist, for logistics of movement by air, sea & land
- Approaching 10 million work hours
- **3.6 million work hours Total Recordable Incident Free**
- Implemented integration of communal camp accommodation
- Female employee development
  - 12% of workforce, 1/3 of in Country leadership, FIFO equipment operators
- Introduced HDPE worksite and temporary road matting to PNG
- Certified training provider – QHSE, Leadership, Operator licensing
  - Complete tens of thousands of training events
  - Mapped to international standards including Australian Training Framework

With a relentless focus on quality, High Arctic is the leader at providing remote worksite solutions for our customers.

[info@haes.ca](mailto:info@haes.ca) | [www.haes.ca](http://www.haes.ca) | +61 7 3911 1385 | +675 7640 2152