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CASE STUDY 3 -

NAVIGATING MARKET SHIFTS:PEL'S DILEMMA

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THE TIGER DOESN'T BLINK.
NEITHER SHOULD YOU.

POWERFLOW ENGINEERING LIMITED (PEL)'S HISTORY & FUTURE VISION

PEL & its Vision

PEL was founded in 1978 and started manufacturing air compressors with a vision to lead the industrial compressor market by delivering innovative, energy-efficient, competitive, and reliable solutions that empower industries to achieve operational excellence and foster sustainable growth through cutting-edge technology and a commitment to quality.

PEL Overview

Current offered Products

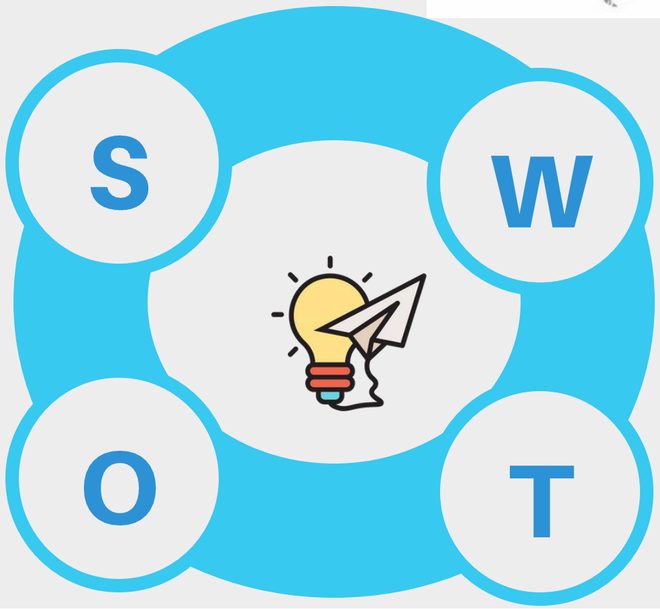
- **Air Conditioning**
- **Refrigeration Systems**
- **Marine HVACR**
- **Process Gas Systems**
- **Vapour Absorption System**
- **Hydraulic Transmission Machine**

STRENGTHS

Strong Industry Experience
Government Support
Potential Cost Reduction

WEAKNESSES

No prior experience in bare compressor development
Unestablished supply chain



OPPORTUNITIES

Technological Advancements
OEM Collaborations
Growing Demand

THREATS

Strong global competition

About the Product

PEL currently imports bare centrifugal compressor from Hamilton International Corporation.. The imports per unit costs Rs **40L - 50L (including import duty)**. PEL wants to develop bare centrifugal compressors in-house to compete in the global market.

Company Financials(2001) to (2006)

- Starting Revenue (2001) : Rs 187.5 Crores
- End Revenue (2006) : **Rs 260.0 Crores**
- Number of years : 5
- CAGR : **6.76%**

Reasons to consider NPD(New Product Development)

Considering in house Centrifugal Compressor

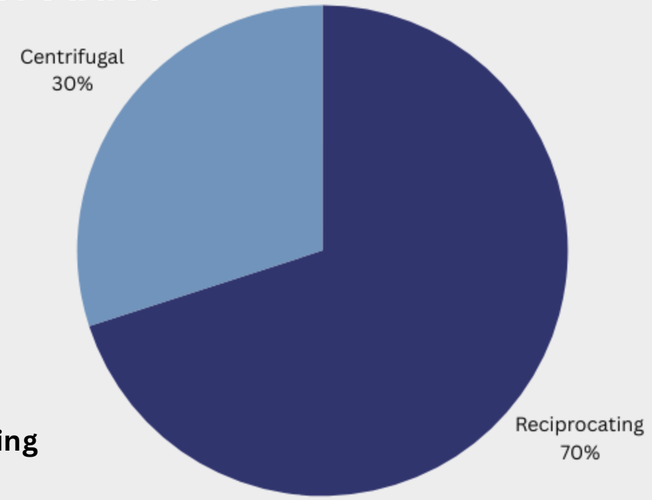
- Reduced Dependency on Imports
- Better Returns & High profits
- Ability to capture wide range of market
- Can leverage SEZ and Tax benefits such as 150% tax reduction for R&D and 100% tax exemptions for first five year

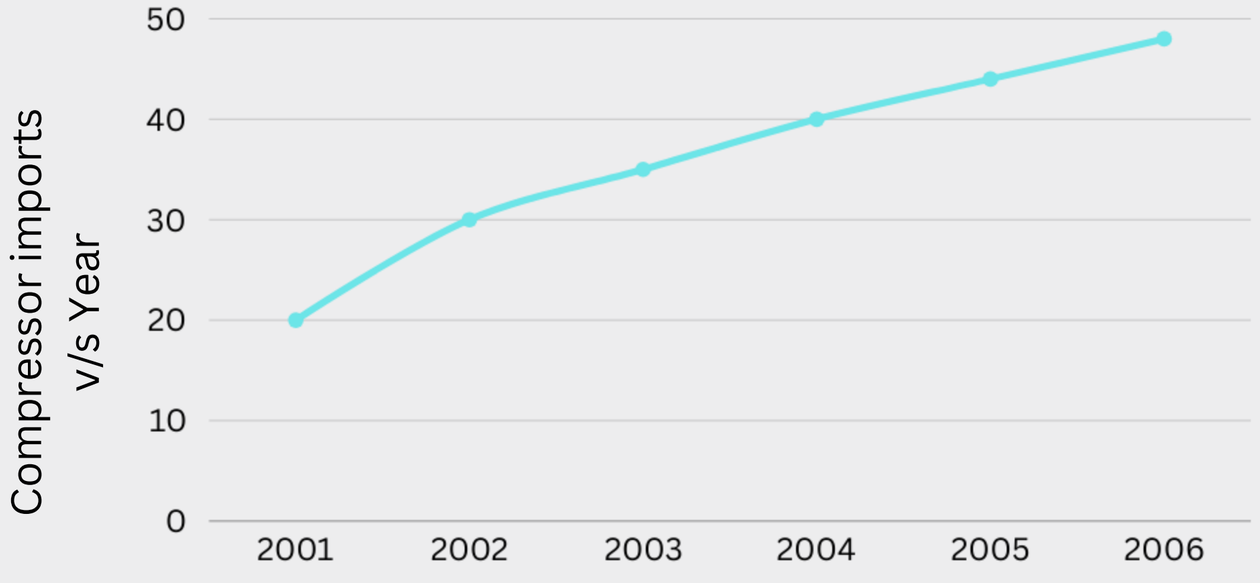
Factors	Imported product cost	In-house developed product cost	Benefit
Cost per Unit	Rs 45L (including import duties)	Rs 30L (no import duties)	High Amount of savings per unit. Can offer competitive prices
Total Cost 250 Units	Rs 112.5Cr.	Rs 75 Cr.	37.5 Cr saved on 250 units. Opportunity to capture a large market
Load Time	High	Low	Faster Product Delivery
Supply Chain	Hamilton International Corporation	Local Suppliers (such as L&T)	Reduced Lead Time, Better quality control
Customization & Tech Controls	Limited	High	Opportunity to capture larger market

Indian compressor market by product

Fast Growing: Centrifugal (30%)

Larger Capacity : Reciprocating (70%)





Strategy to obtain 20% Market Size

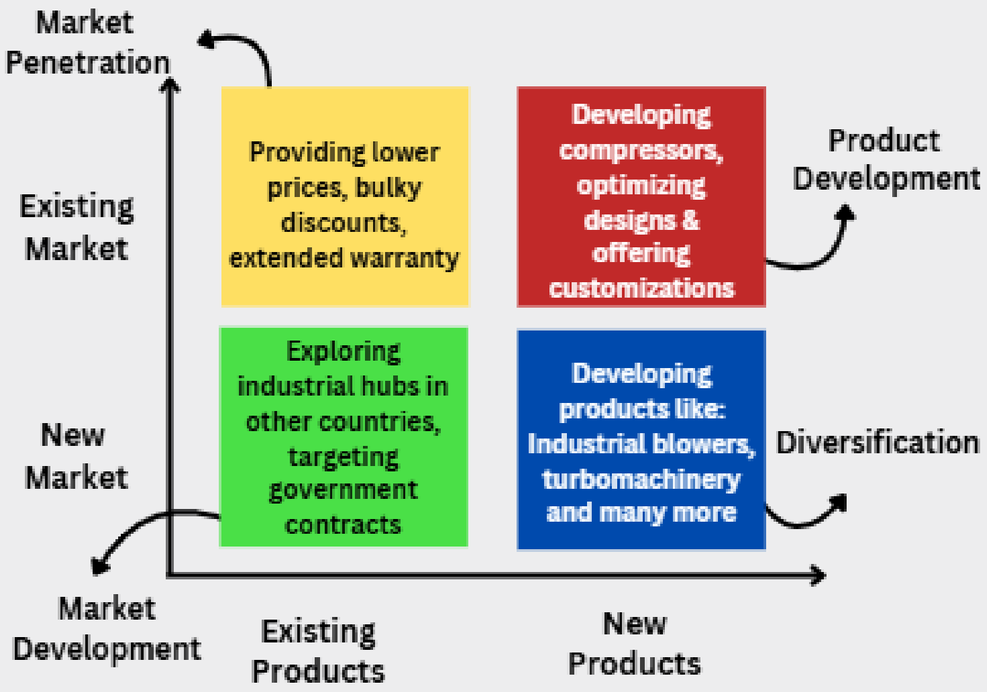
Competitor Market Share

Ingersoll Rand - 50-60% in India

Atlas Copco - 30-40% in India

ELGI Equipments - 30% in India

Ansoff Matrix



Porter's 5 Forces Model for Market Share Growth Strategy

Threat of Substitutes

- Position centrifugal compressors as a long-term cost-saving investment.
- Prove that PEL's compressors save electricity & maintenance costs vs. imported models.

Threats for entrants

- Partner with local Indian suppliers (Bharat Forge, L&T) for cost savings.
- Utilize 150% R&D tax deduction & SEZ benefits to lower costs.

Competitive Rivalry

- Capturing market with new technology.
- Offering lower prices by reducing dependency over imports.

Bargaining Power of Buyers

- Provide extended warranties & predictive maintenance. Offer EMI-based models to reduce upfront investment.
- Allow OEMs to integrate compressors into their systems easily.

Bargaining Power of Suppliers

- Develop long-term contracts with local manufacturers. Negotiate wholesale rates to lower per-unit costs.
- Reduce dependency on external precision machining vendors.

Timeframe Planning for Market Share Growth

Market Entry & Foundation
Goal: 5 - 10% Market Share
Time: 2 years (2007-2009)
Investment: 10Cr.

Expansion & Growth
Goal: 12 - 15% Market Share
Time: 2 years (2009-2011)
Investment: 10Cr.

Scaling & International Expansion
Goal: 15 - 20% Market Share
Time: 1 years (2011-2012)
Investment: 15Cr.

Manufacturing & Cost Leadership
- Systematic plan of investment.
- Use of tax benefits
- Hiring Staff- Design – 4No’s

Supply Chain Development
- Partnering with local suppliers
- Reducing materials imports
- Set up of CNC machines
- Hiring Staff- Operations - 4 No’s

Customer Acquisition & Branding
- Offering 10-15% lower prices
- Targeting existing customers

Enhancing Product Competitiveness
- Developing AI based model for maintenance
- Optimizing designs
- Customization for specific industries
- Hiring Staff - Design - 4 No’s

Strategic Sales & Distribution
- Expanding into large industrial hubs
- Offering bulk deals & annual maintenance contracts to refineries.
- Hiring Staff - Maintenance - 2 No’s

Technology Partnerships & R&D Investment
- Collaborating with IIT’s and CSIR labs
- Investing in high precision 5 axis CNC machines
- Conduction real-time testing using Digital Twin Technology
- Hiring Staff - Operations - 4 No’s

Expanding Production Capacity
- Scaling up production
- Securing long term bulk supply contracts

International Market Entry
- Setting up export partnerships with EPC firms
- Using SEZ benefits for competitive pricing
- Localized service & maintenance

Strengthening Market positioning
- Strengthening brand perception using certifications
- Developing an in-house training academy for industries
- Hiring Staff - Design - 2 No’s Operations - 6 No’s

Phase 1 | **Phase 2** | **Phase 3**

Milestone in Phase 1: Securing initials large industrial clients
Milestone in Phase 2: Reduce per unit Cost from ₹ 30 L to ₹ 25 L
Milestone in Phase 3: Signing of international deals

Building Supply Chain based on SCOR Model

- Importing compressors to maintain sales
- Investing Rs. 10Cr for supply chain setup and manufacturing
- Searching domestic suppliers for components
- Finalizing contracts with local suppliers

- Checking material quality and benchmarking them
- Starting small-component plant for R&D and material test
- Purchasing and setting up 2 CNC machines
- CFD simulations, impeller and diffuser testing

- Prototype manufacturing and testing
- Setting up pilot plant and starting in-house production
- Testing compressors in HVAC's and other industrial units
- Shifting of 5-10% orders to in-house
- Product improvement through customer feedback

- Increasing in-house production
- Securing major customers like oil & gas industry and refineries
- Purchasing and setting up 3 CNC machines
- Establishing after sales network
- Shifting 40-50% orders to in-house development

- Optimizing processes , machines and cost efficiency
- Plant scaling up for meeting up production orders
- Shifting 100% orders to in-house development

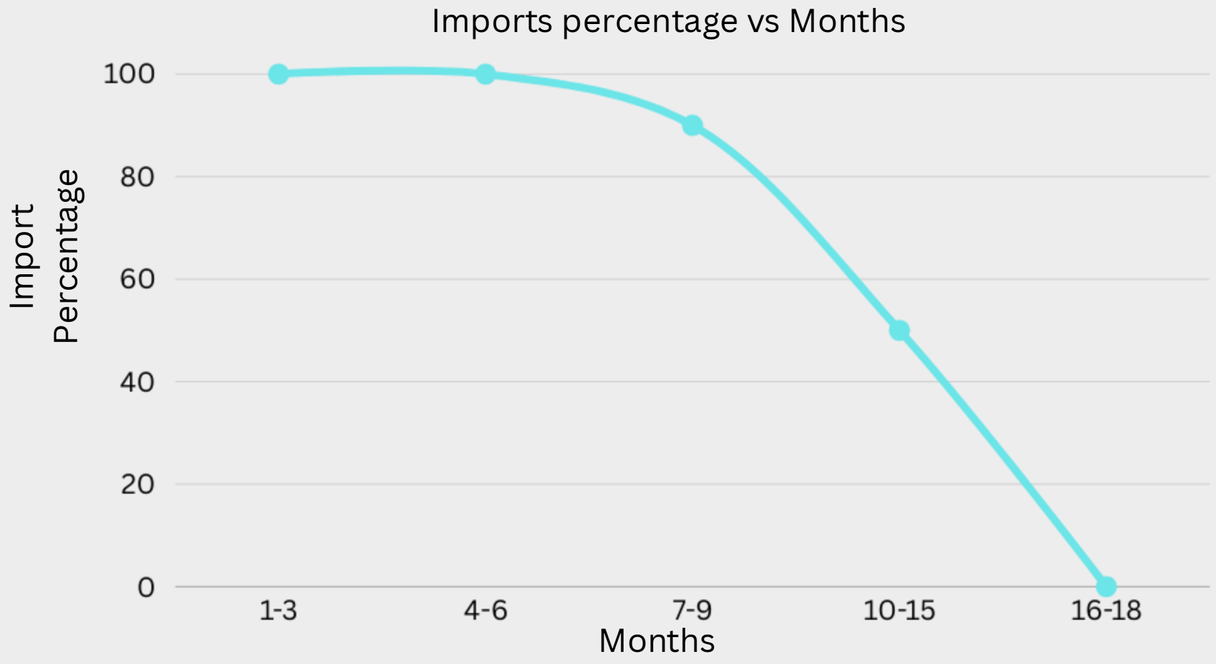
Months: 1-3 — 1 — Plan

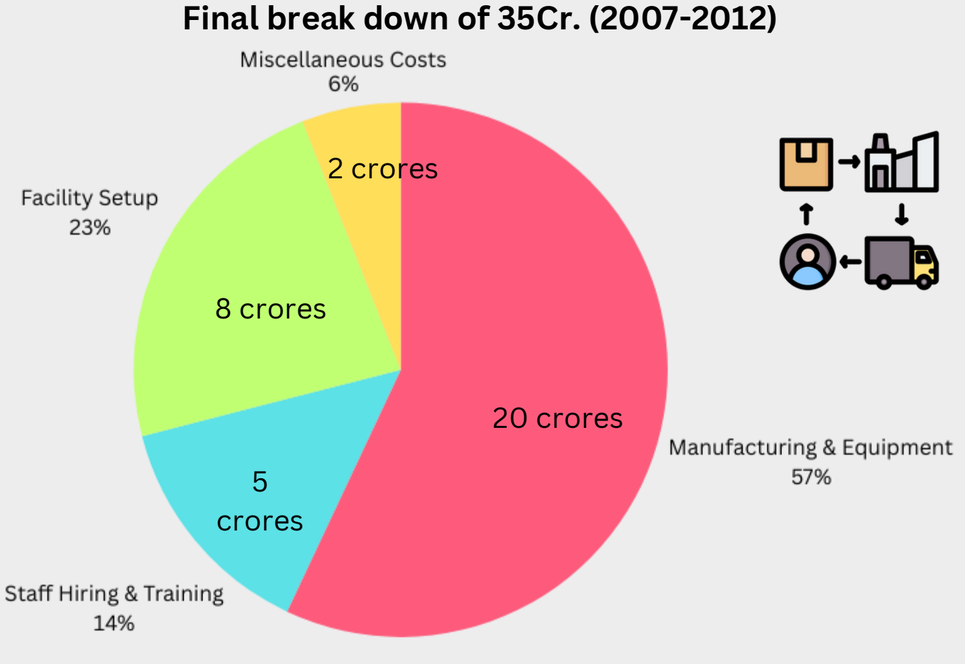
Months: 4-6 — 2 — Source

Months: 7-9 — 3 — Make

Months: 10-15 — 4 — Deliver

Months: 16-18 — 5 — Return





Leveraging Cutting-edge tech for New Products

Design & Performance Optimization (R&D Phase)

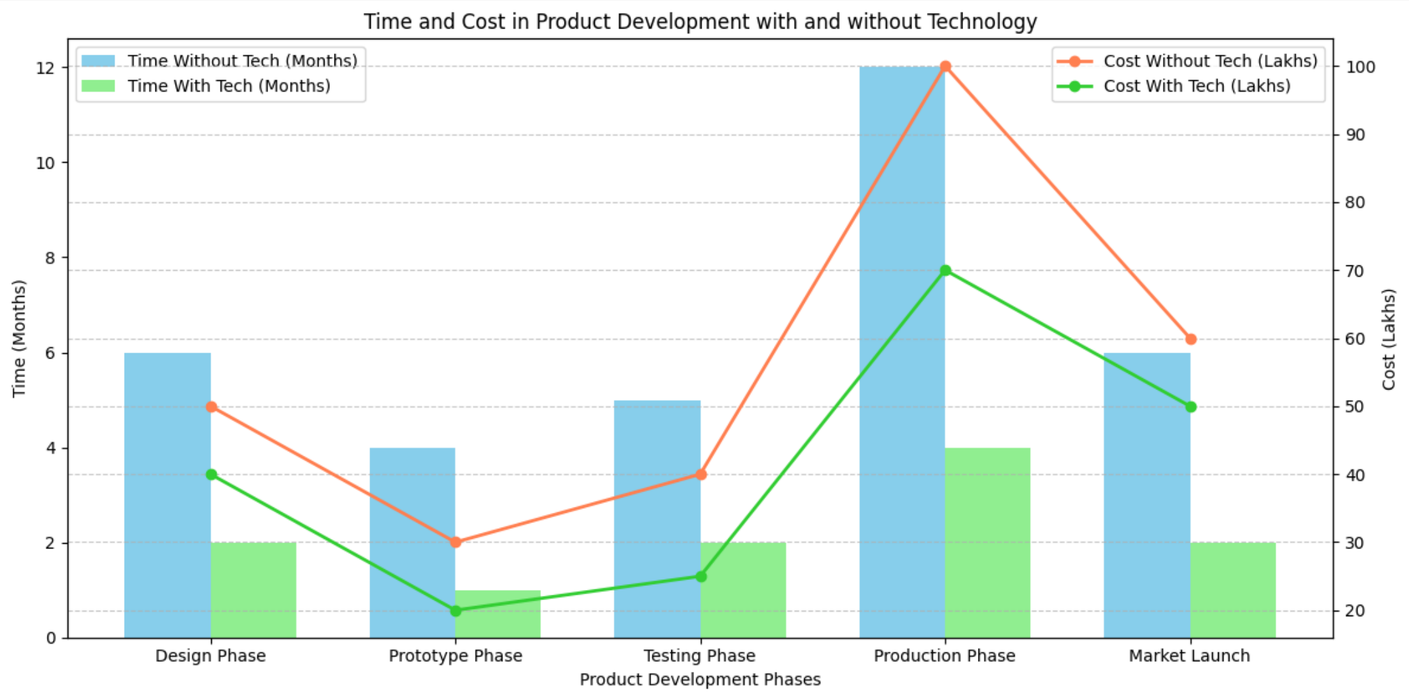
- Impeller Design Optimization
- Diffuser Efficiency Enhancement
- Integrally Geared Compressors

Manufacturing & Cost Reduction (Production Phase)

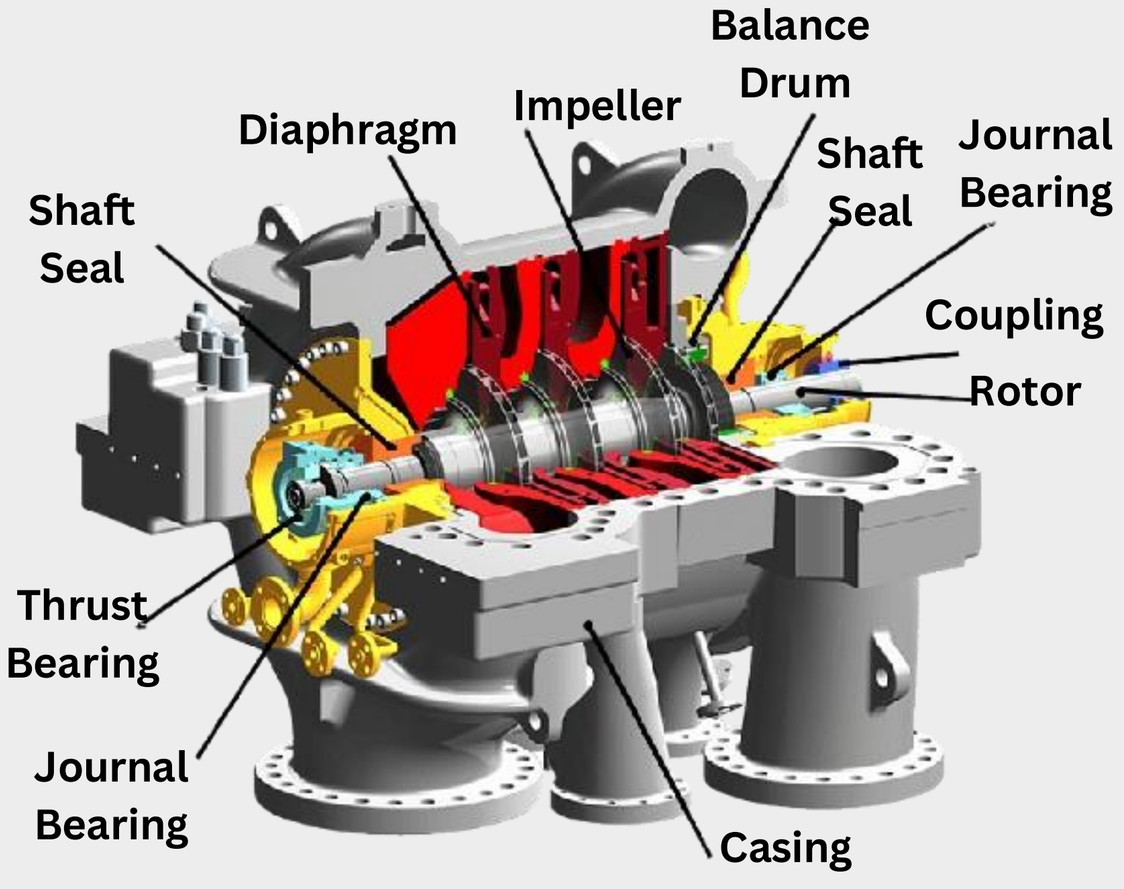
- High precision CNC Machining & 3D Printing
- Advanced Material Testing
- Automation & Robotics

Smart Technology & IOT Integration (Post sales & Maintenance Phase)

- AI Based Predicted Maintenance
- Remote Monitoring & Cloud Performance Optimization



Graph shows the effect of technology in cost and time of production.



PEL’s Vision for In-House Centrifugal compressor

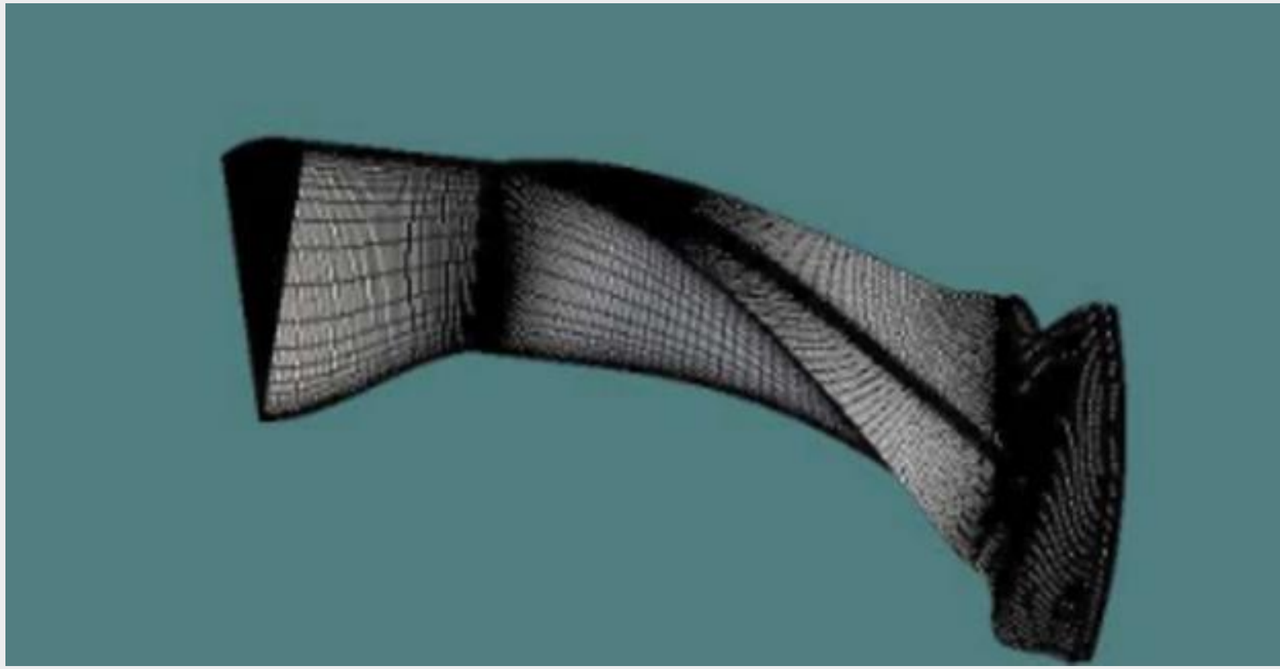
To lead the market:

- Innovative, energy efficient, competitive solutions
- Cutting edge technology

Advantages

- Longer life span than screw and rotary
- Providing competitve prices by reducing taxes & duties
- Collaborating with IITs and CSIR Labs to provide compressors develop on latest technologies
- Optimizing Compressors through R&D with the help of softwares like Ansys

CFD provide Data on - Efficiency vs mass flow
Pressure vs mass flow, Power vs mass flow



Parameter	1	2	3	4
Speed/rpm	9750	13650	15600	19500
Mass flow rate Kg/s	2.85	4.1	4.9	6
Pressure ratio	1.3	1.8	2.1	3.33
Efficiency	0.71	0.75	0.76	0.79
Power kw	100	300	450	900

Challenges and Risks

Risks	Impacts
COVID - 19 Pandemic	• Workforce unavailability • Supply Chain Disruptions • Gradual fall on demand of compressor due to decrease in industrial activity
Demonetization	• Problem of exchange rate volatility • Worse Credit conditions • Liquidity Crunch • Payments Delays
Change in Tax Structure	• Inflation costs problem rises • Difficult for investment strategies
Market Risks	• Competitors like Ingersoll Rand and Atlas Copco dominate the market

COVID - 19 impact Response and solutions

Consolidate:
Considering Partnerships and reduce competition

Servitization:
To increase manufacturing by evaluating business model

Innovation:
Create and develop new products

End-use industries:
Target those industries that provides services to end users for our business

Procurement:
Evaluate various procurement options and update strategies

Locations:
Target and strategize suitable locations to plan sales

Risk Mitigations Plans

THANK YOU