Investing to **build a better future**

Danfoss Smart Manufacturing

Tarun Chopra
Head of Manufacturing Services, Danfoss Group IT
Professional Introduction

- Tarun Chopra, Head of Manufacturing Services, Danfoss Group
- Bachelors of Engineering – Computer Science
- Masters in Information Systems
- Work experience – 22 years
  - Continental AG
  - Samsung Electronics
  - Siemens AG
- Global Experience
  - 15 years in Germany
  - 5 years in Seoul, South Korea
  - 3 years in Melbourne, Australia
- Functional area of Expertise: Business IT Strategy, Merger & Acquisitions, E2E Supply Chain, Manufacturing IT & Shopfloor systems
- What drives me – Disciplined consistency, Strategy, Execution and Family
Danfoss at a glance

Three strong business segments with leading positions

<table>
<thead>
<tr>
<th>Danfoss Power Solutions</th>
<th>Danfoss Climate Solutions</th>
<th>Danfoss Drives Power Electronics and Drives</th>
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<tbody>
<tr>
<td>1933</td>
<td>Worldwide sales in more than 100 countries</td>
<td>+42,000 employees</td>
</tr>
<tr>
<td>Long track record within innovative engineering</td>
<td>100 countries</td>
<td>+42,000 employees</td>
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<tr>
<td></td>
<td>Preferred partner in helping our customers decarbonize</td>
<td>97 Factories in 20 countries</td>
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Three business segments

**Danfoss Power Solutions**
- 5.1bn EUR annual sales
- 18,535 employees
- 52 factories
- 3 Application Development Centers

50% of Group sales

**Danfoss Climate Solutions**
- 3.2bn EUR annual sales
- 10,331 employees
- 31 factories
- 4 Application Development Centers

31% of Group sales

**Danfoss Power Electronics and Drives**
- 1.9bn EUR annual sales
- 7,875 employees
- 17 factories
- 4 Application Development Centers

19% of Group sales
Our world – sectors we serve

- **Danfoss Power Solutions**
  - Construction
  - Industry
  - On-Highway
  - Agriculture

- **Danfoss Climate Solutions**
  - Residential Heating
  - Cooling
  - District Heating
  - Air Conditioning

- **Danfoss Power Electronics and Drives**
  - Industry
  - Brewery
  - Automotive
  - HVAC
With transformational growth, **Danfoss is a different company** with sales above EUR 10bn and 42,000 employees.

- **2022:** ~EUR 10.3bn
  - **Reported growth in 2022:** +36%
  - **Organic growth in 2022:** +15%
  - **EBITA in 2022:** +26%
  - **Cash flow in 2022:** +16%
- **2021:** EUR 7.5bn
- **2017:** EUR 5.8bn
Working towards **one strong digital platform for Danfoss and our customers**

**ENABLERS**

- Research & Development
- Supply Chain
  - Product Lifecycle Management (One PLM)
- Sales & Marketing
  - One ERP & Smart Manufacturing
  - One CRM
  - Digital Customer Experience
- Modern, Scalable & Hybrid IT Infrastructure
  - Integration & Data (Management)

**DIFFERENTIATORS**

- Customers
- Products & Services
  - Segment IoT solutions

**We are **executing** a digital transformation of our entire value chain**
Supply Chain value stream
Dissecting ‘Smart Manufacturing’
Smart Manufacturing Journey
Initial Focus areas – Delivering on GMM Commitments

MES/MOM
- Execute on MOM Platform(s) in Danfoss
- OEE Solutions
- Predictive Maintenance

Connectivity and Standardization
- Flexible – ISA Layer 3 Agnostic
- Interconnected systems via APIs

OT Security
- Risk assessment and build Standard
- Prepare and start rollouts
- Trainer the trainers

BUSINESS VALUE

1. High Quality Data -30 %
2. No Touch Processes- 10%
3. Improved Salaried Productivity (10-15%)
4. Enabler for e2e Process automation
Smart Manufacturing Journey – First 4 focus areas

- **Standard MES/MOM platform(s)**
- **OT Security**
- **Organizational Change Management**
- **Connectivity**
- **Edge OT**

**The road ahead**

- **2019**
  - Value Proposition for Smart Manufacturing

- **2020**
  - State Assessment across Danfoss for Danfoss 3 segments

- **2021**
  - Consolidate use case across multiple segments

- **2022**
  - Approved – workstreams
    - Translate into Roadmap and Initiate Pilot
  - Organizational evolution, Rollout roadmap for in 1 out of 3 segments

- **2023**
  - Templatization and Governance evolution

- **2026**
  - Further rollouts to other segments
    - Re-evaluate the needs and re-iterate the roadmap
Learnings

• Top down and bottom up buy in
• Find your own sweet spot – Balance between ambition and need of the hour
• This is a ‘Journey’ – Re-evaluate every step/project – Business value
• Know your strengths and weakness - be bold to pause, re-iterate and re-restart
• Build a strong partner network