Our Discussion Today - Scope 1, 2 and 3 Emissions
Capital Projects Perspective - Connecting to Sustainability

Scope 1 - Fuels we burn as an organization direct GHG potential

Scope 2 - Power Consumption

Scope 3 - Indirect activities through the supply chain

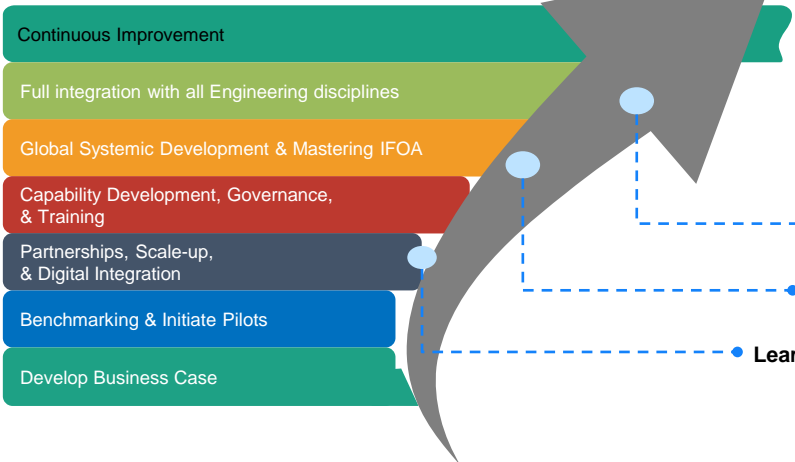Scope 1 and 2 - renewable electricity, elimination of GHG generating equipment

Scope 3 Decarbonisation challenge for industry, where information needs to reliably provide accurate and digitized data on emissions performance.

Through appropriate contract formats, digitization of design, project management and changing methods of project delivery, influence industry to engage in a journey, to radically reduce overall emissions.

Projects - Aligned with Pharma Vision

Our Purpose
Doing now what patients need next!

- **Roche 2030 Ambition**
  Making impact at societal level
- **Pharma Vision**
  3 to 5 times more medical advances at half the cost
- **PT Global Engg. Contribution**
  Implement LPD to improve speed and value of capital projects by **30%-50%**
- **PT Response**
  Fast to patients
  Robust processes
  Efficient operations

Central Wheel

- OUR CONTRIBUTION
- ECOSYSTEM FIT
- WHAT, HOW, WHO
- WHEN WE PLAN TO DO IT

- Bold Ambitions
- See & Solve the Right Problems
- Radical Simplification
- Shared Accountability
- Organizational Capabilities
- Pioneer for Excellence

Left Progression (bars)

- Continuous Improvement
- Full integration with all Engineering disciplines
- Global Systemic Development & Mastering IFOA
- Capability Development, Governance, & Training
- Partnerships, Scale-up, & Digital Integration
- Benchmarking & Initiate Pilots
- Develop Business Case

- Full Adoption
- Transition Phase
- Learning Phase

Global Engineering Contributions

PT Global Engineering will shift to Lean Integrated Project Delivery to increase speed and value of capital projects by 30%-50%. We will implement a Lean Integrated Project Delivery model to enhance collaboration with our sites, F & E, and Landlord Site Orgs, integrating teams, co-creating value & continuously improving our operations.

Our Values, Outcomes, and Measures

Value: deliver to project charter
Schedule: Deliver to or better than project charter
Safety: Our core value / zero incidents / transparent
Culture: High performing One Global Roche Delivery Team
Quality: Zero rework / meets regulatory requirement / sustainable

Culture Shift

Full transparency, internal & external collaboration and trust, bold courage to take calculated risks, balanced standardization, modularization, & flexibility, team decision making, shared accountability, maturing as a learning culture.

Our Situation

Traditional project-delivery models are plagued by issues & inefficiencies: a lack of integrated systems thinking; prioritizing short-term cost management over long-term outcomes; poor communication between stakeholders; and bespoke projects & rigid planning systems that struggle to identify or adapt to changing demands.

Who will we learn from

Lean Construction Institute (LCI), IPD implementation in other sectors (including P&G), Documented best practices by external consultancies (Mckinsey), and our own work to improve traditional capital project delivery.

Engineering Manual

Project Execution Plan (PEP). Safety, user brief, project execution strategy, cost/forecast, schedule, risk log/mitigation need to be included in the PEP.

Critical Tools/ Systems

Partner Selection, Collaborative Design Sessions, Big Room (visual management), Standard Qualification Approach (off the shelf), TVD, Last Planner System.

Where will we start

All projects, big and small. We will demonstrate value of approach on most complex, difficult projects. We will use LPD on the next SUT facility we build.
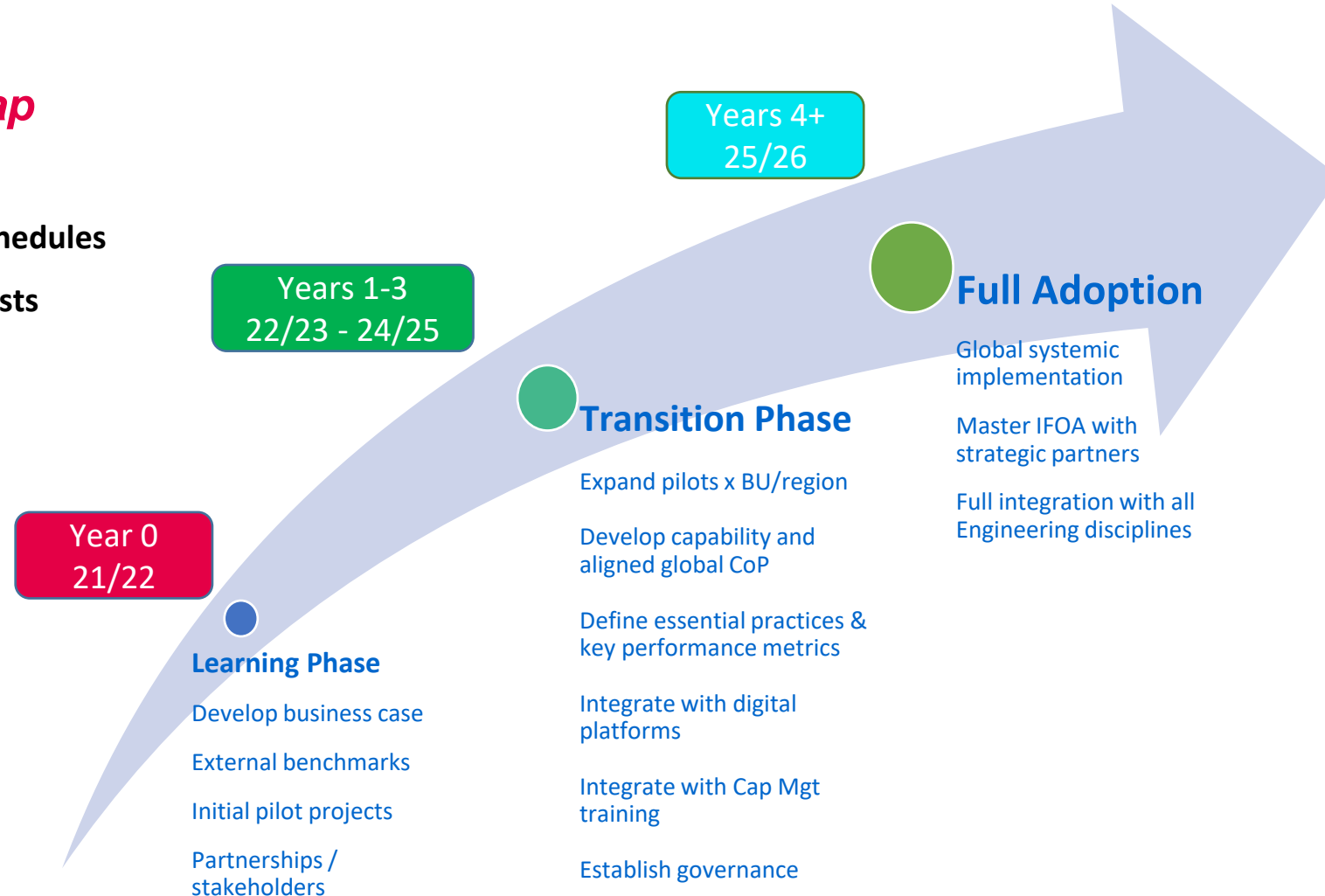

Without looking to improve, we will not deliver on the Pharma Vision

Lean Integrated Project Delivery Roadmap - Supporting Sustainability

Lean Roadmap

❖ **Up to 30% Faster Schedules**

❖ **Up to 15% Lower Costs**

❖ **Quality & Safety**

❖ **Sustainability**

Years 4+
25/26

Years 1-3
22/23 - 24/25

Year 0
21/22

Full Adoption

Global systemic implementation

Master IFOA with strategic partners

Full integration with all Engineering disciplines

Transition Phase

Expand pilots x BU/region

Develop capability and aligned global CoP

Define essential practices & key performance metrics

Integrate with digital platforms

Integrate with Cap Mgt training

Establish governance

Learning Phase

Develop business case

External benchmarks

Initial pilot projects

Partnerships / stakeholders

Lean Advantages

Safety
Sustainability
Quality
Value
Cost
Time
Culture
Capability

Our vision moving forward for our facilities – Strong link to Sustainability and back to our project approaches

Pharma TechOps of the Future Ecosystem

We combine Technological Innovation with Augmented Human Capabilities to drive better Experiences & Outcomes

SMART factories

- Connected equipment
- AI / Digital twin based product, quality and process optimization
- Intelligent automation

Improved patient EXPERIENCE

- E2E product tracking with IoT devices
- Real-time connectivity
- Feedback about treatment effectiveness

Enabling

- PT's contribution to the **pharma vision** by achieving our **performance promises**

- Manufacturability of evolving **product portfolio**

- Empowered **work environment**

- **Sustainability**

AUGMENTED people

- Self-service & interconnected data, analytics & knowledge platforms
- Next-gen collaboration & learning environments
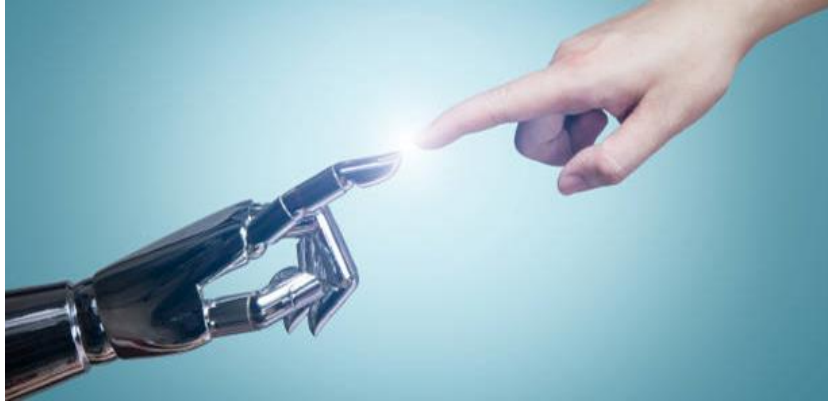- 360° product & process understanding

CONNECTED suppliers

- End-to-end real-time supply chain transparency
- Analytics-driven optimization
- Advanced collaboration platforms

Roche

New Plants - DIGITAUT   (Digital, IT, Process Automation)

Factory of the future with digitalization & automation

High Level Target (CEC)

- Improved quality and compliance

- Better and faster decisions

- Improved agility and efficiency of our processes and facilities

- Improved lifecycle management for our plants and systems

- Attracting new talent

Delivered Through

- Modular Plant Design

- Plug & Produce with Smart Sensors

- Implement and extend use of (In-)Process Analytical Technology

- Evaluation of Real Time Release Testing use

- Digital Twin (BIM / Integrated Engineering, Process Twin)

- Predictive Maintenance

- Capable for future robotics

- Virtual / Augmented Reality
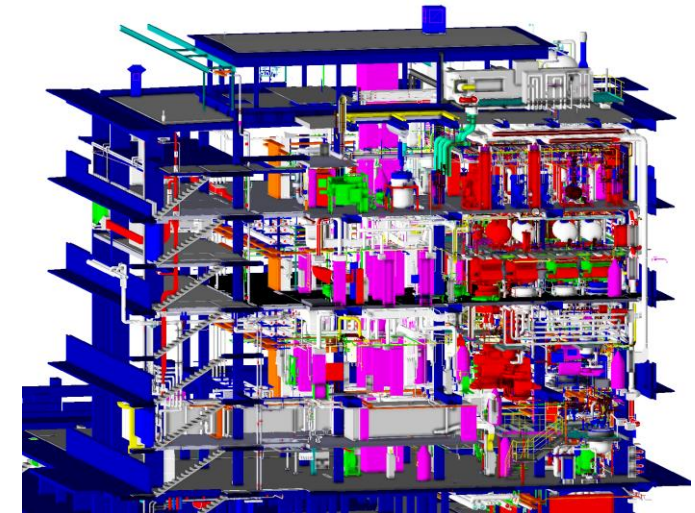
KPI's / Digitization of Information to Drive Results

Project KPIs (Key Performance Indicators) for sustainable construction we are using and plan to develop.

1. **Energy Efficiency**: Measure energy consumption reduction in buildings in place. .

2. **Waste Reduction**: Track the amount of construction waste diverted from landfills through digitalized waste management systems.

3. **Carbon Emissions**: Monitor carbon emissions reductions achieved through optimized construction processes and material choices.

4. **BIM Utilization:** Assess the level of BIM integration and utilization throughout the project lifecycle.

5. **Materials Sourcing**: Evaluate the use of sustainable materials and the reduction of environmentally harmful materials.

6. **Digital Collaboration:** Effectiveness of digital collaboration tools in enhancing communication and coordination among project stakeholders. - CORA / ACC / Doxel / BIM / Touch Plan

7. **Project Schedule Adherence**: Track project timelines and deadlines to ensure efficient project delivery.

8. **Cost Savings**: Measure cost savings achieved through Target Value Delivery reduced rework, improved productivity, and optimized resource allocation.

9. **Stakeholder Satisfaction**: Assess stakeholder satisfaction with the project outcomes implementation reviews.

10. **Environmental Impact:** Evaluate the overall environmental impact of the project, considering factors such as resource consumption, emissions, and ecological footprint.

BIM - Building Information in One System

Digital Twin

Connecting the building models to real time data (SAP, BAS, EMS, Asset Tracking, Verge Sense, etc.)

Facilities Management

View real time equipment metadata, locations, status, access requirements, user manuals, drawings etc.

Energy Modeling

Real time energy use monitoring. Models can support simulations for optimization

SAP Integration

Automated data flow from models to CMMS (SAP) and from SAP back into the model real time

Real Estate Management

Real time occupancy data, asset tracking and space utilization

BIM Model as a Right of Reliance in Project Delivery Ecosystem

Models can be used a the "record set" and 2D dwgs produced for consumption from the model

Future Use Cases

Use cases will be facilitated by models that are produced (via Standards) for that specific purpose

# Business Rationale and Strategic Context Data Digitization

Benefits of One PPM & Resource Management tool

COST Savings

--Yearly savings upto ~ S1.3 M; includes savings via risk mitigation, risk avoidance, re-keying data, data analysis etc

EFFICIENT Operations

-- One enterprise solution equally effective for ~200 Global stakeholders across 13 sites.

-- Accuracy and fast access to information:
Approval workflows and notifications/alerts, one source of data
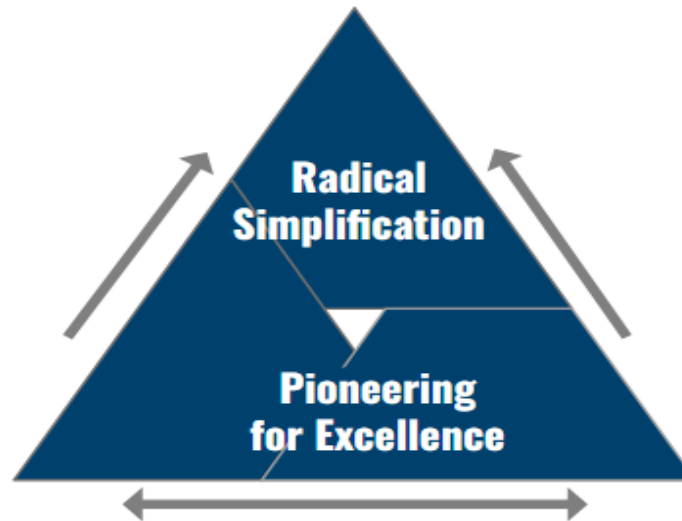
ROBUST Processes

-- Standardized solution enabling users to streamline business processes ; Portfolio management and better collaboration across PTT and Business partners(users, steering committee)

-- Unified, Simple and Responsive UX: enable agility

Radical Simplification

Pioneering for Excellence

Project and Portfolio Management in Roche
High-level feature overview – Digitization of Information to Track Performance


Portfolio Management

- Forms to capture register items for changes at project, programme and portfolio level;
- **Create workflow processes** depending on the types and values of changes captured;
- Compare baselines to see the impact on changes;
- **Audit and track all changes** identified and modifications made over their lifetime.
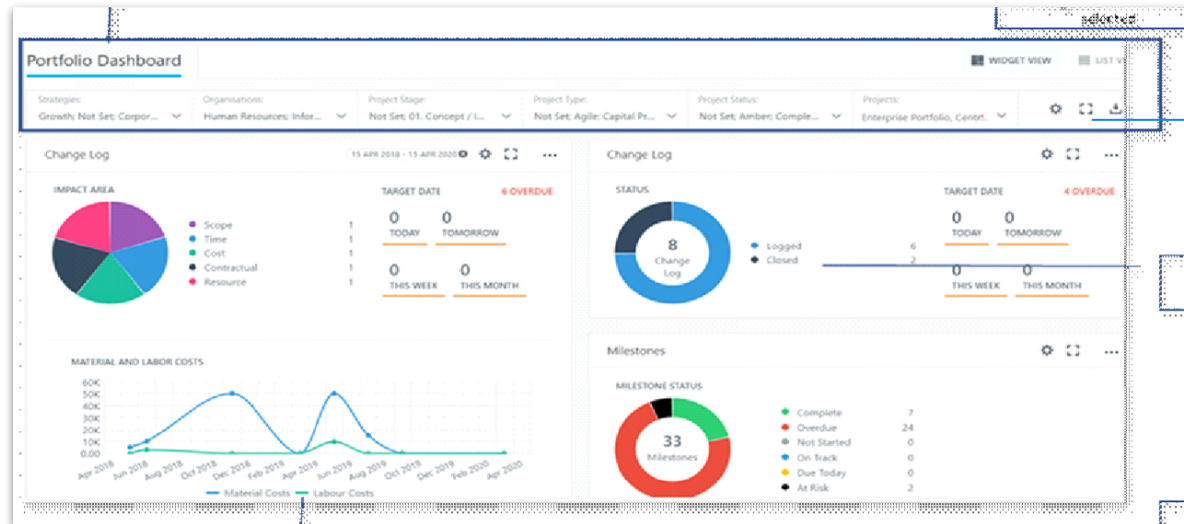
Gantt charts for planning projects

- Automated **Work-Breakdown-Structure** flows
- **Manage dependencies** across multiple projects and assess the impact.
- **Define tasks, milestones** and even whole projects across multiple programmes
- Resources can be assigned to tasks within the schedule, with actual effort recorded via a Time Sheets module.
- **MS Project and Excel imports**
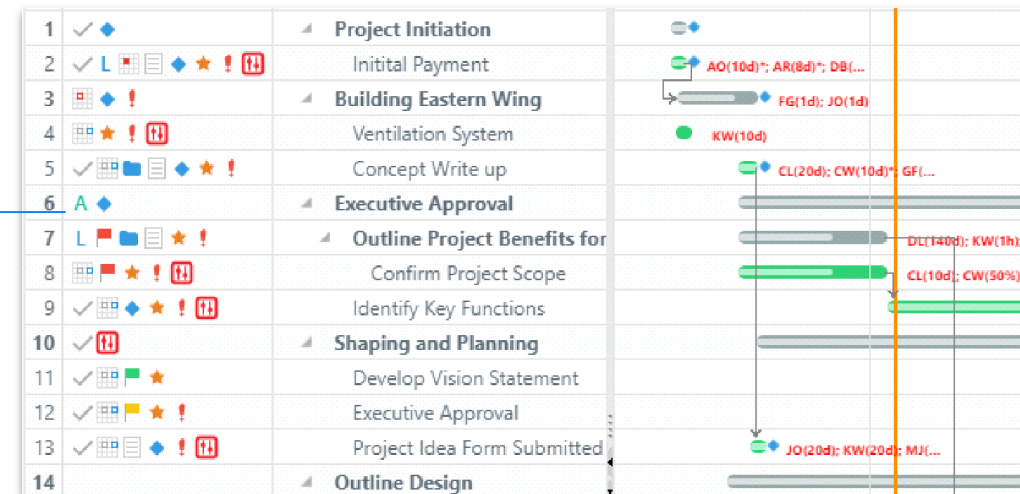
Doxel | Real Time Production Monitoring & Quality Assurance
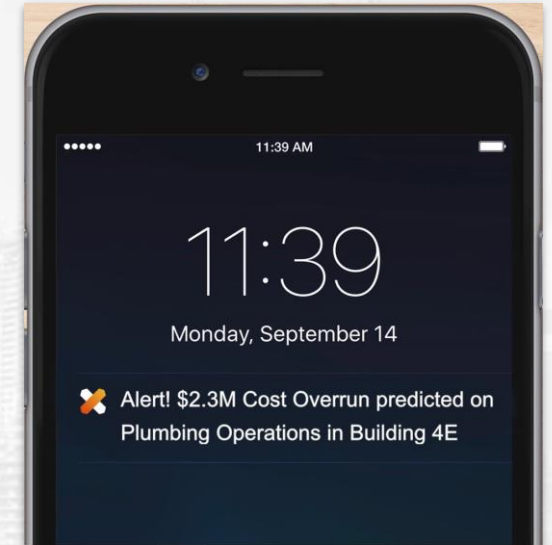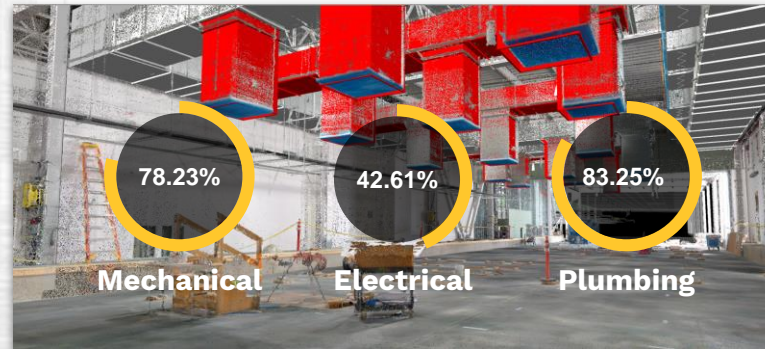
Digital twin using
2x/week data capture

Automated Progress Tracking &
Quality Deviation Analysis

Early warnings for
Schedule & Quality risks

Empowers field PMO teams with real-time schedule & quality insights to manage the **site proactively**, **prevent degradation of float** and **minimize rework**

Doxel | Overall Summary of the Value Proposition

Demonstrated Savings (Pilot)

21%
of Misreporting Averted
Using objective reporting & deviation analysis on progress tracking

100%
Rework delays averted
with automated quality control

3 Days
Critical path delay averted
with early warnings on at risk schedule items

15%
Improved schedule efficiency
through accurate progress tracking

The above numbers represent savings **realized with** late-stage project tracking during just a **12-weeks pilot**

Potential Savings

60-80%
Reality capture savings
with Doxel's AI powered object recognition and point to point alignment technology

20-30%
Inspection savings
with Doxel's automated deviation analysis

Ecobalance Project Progress Centralized Sustainability Dashboard

Dashboard provides visibility at the site level
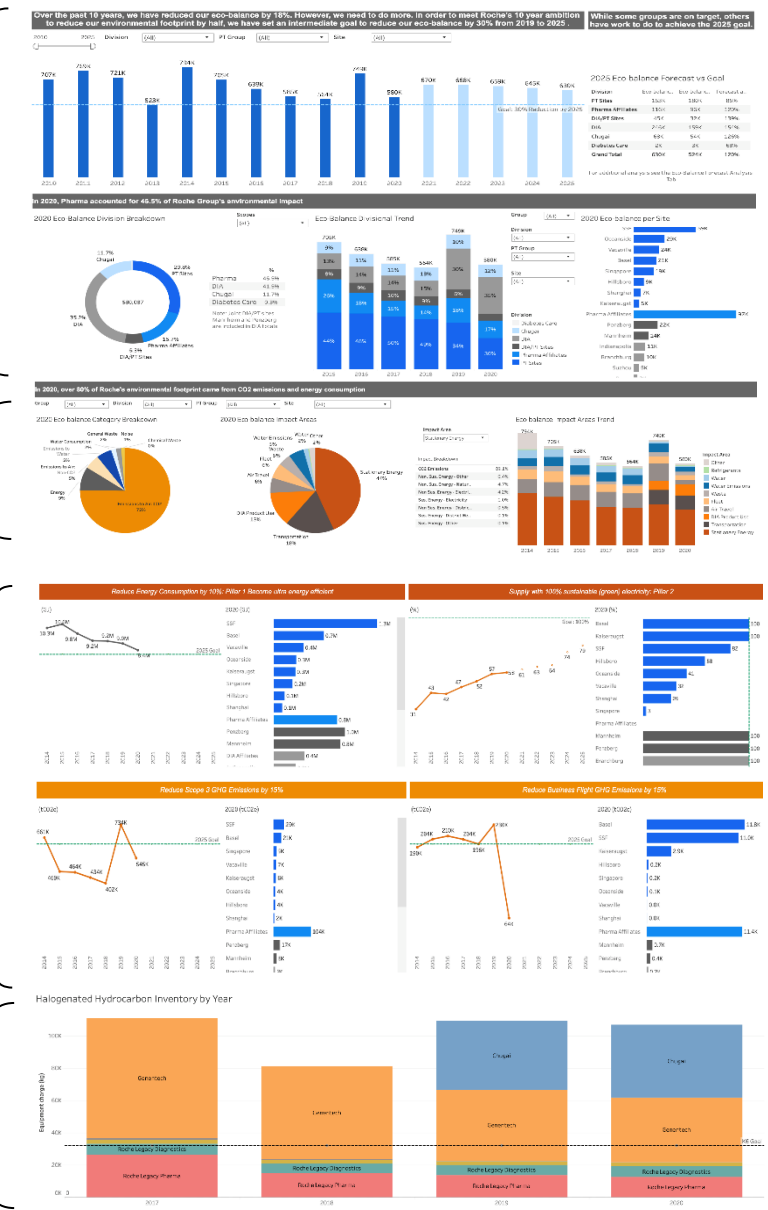
Aggregates Data for PT and DIA

Provides Eco-balance projects Analysis

Site progress toward Ecobalance goal

Projects identified
Project status

PT progress toward Ecobalance goal

K6 Inventory by Year

Please refer to different tabs

PT Sustainability Circles

Agile structure that mirrors strategic priorities

How to create circles

- Sub-circles 1: PT Domains not Focus topics (e.g. decarbonization)
- Define sub-circle purpose & outcomes
- Define roles & empower
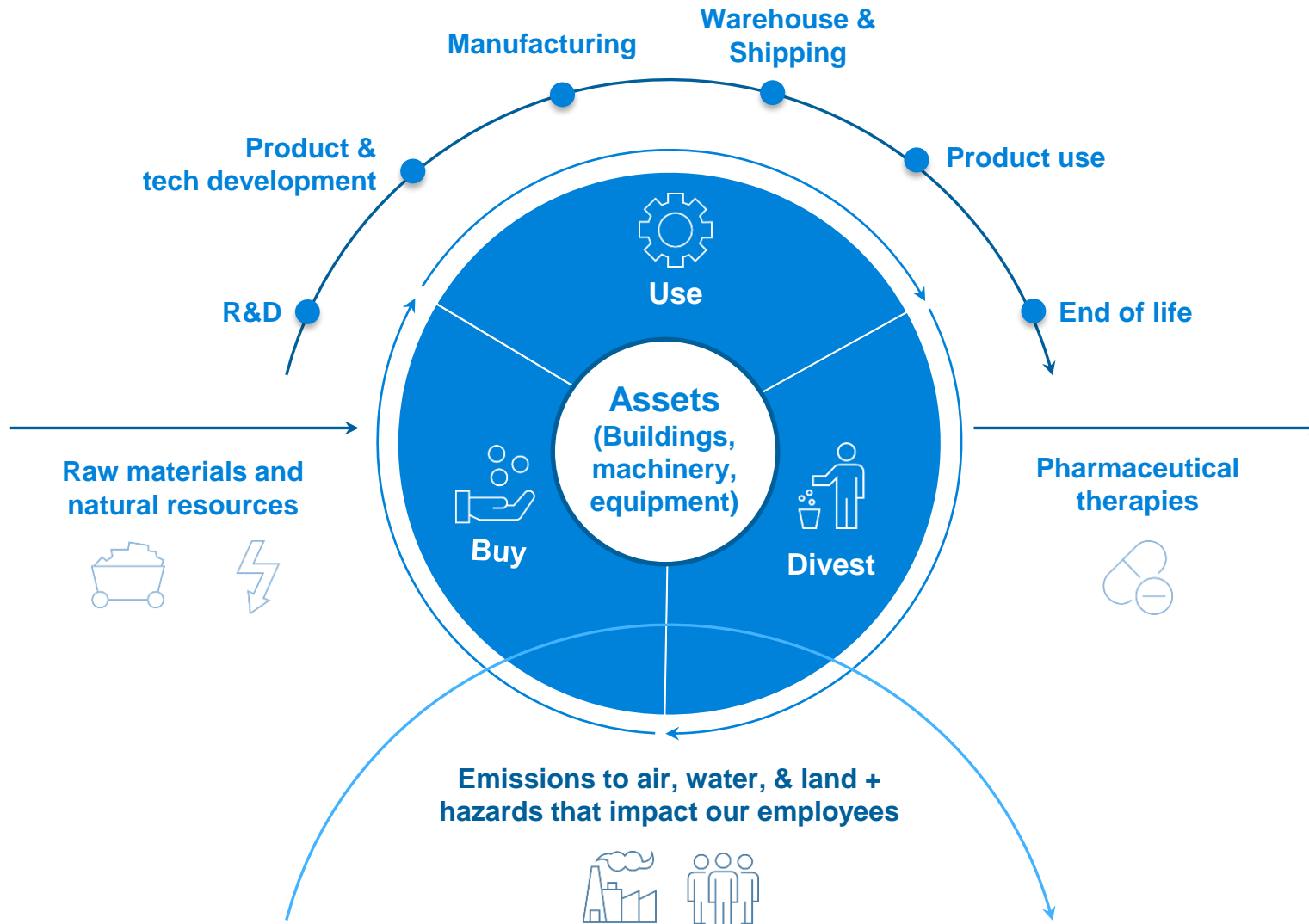- Plug it together

Sub-circles (level 1)

- Ecobalance/CoP (Operations)
- Prod. Stewardship (Products)
- Supply Chain
- Employees
- QC/In vivo assays (Ethics&Patients)
- Product compliance (Products)
- Manufacturing Proc.&Tech. (Operations/Products)

Interface PTLT / Corporate Sustainability / Core circle lead

- PT BPO Sustainability
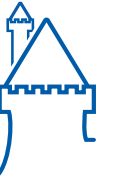
Asset Lifecycle Management and Sustainability

Our Asset LCM goal is to maximize our assets through their lifecycles to **ensure compliance, improve efficiency, manage risk** and **advance innovation**

Our sustainability goals align with SHE's 5-year goals:

- Improve people's health and productivity
- Minimize environmental impact
- Reduce greenhouse gases to zero
- Keep our business running
- Minimize damage to our assets
- Ensure SHE knowledge and motivation

Diagram labels:
- Manufacturing
- Warehouse & Shipping
- Product & tech development
- Product use
- R&D
- End of life
- Use
- Assets (Buildings, machinery, equipment)
- Buy
- Divest
- Raw materials and natural resources
- Pharmaceutical therapies
- Emissions to air, water, & land + hazards that impact our employees

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