Continuous biomanufacturing reduces environmental impact

Nick Hutchinson, Just – Evotec Biologics

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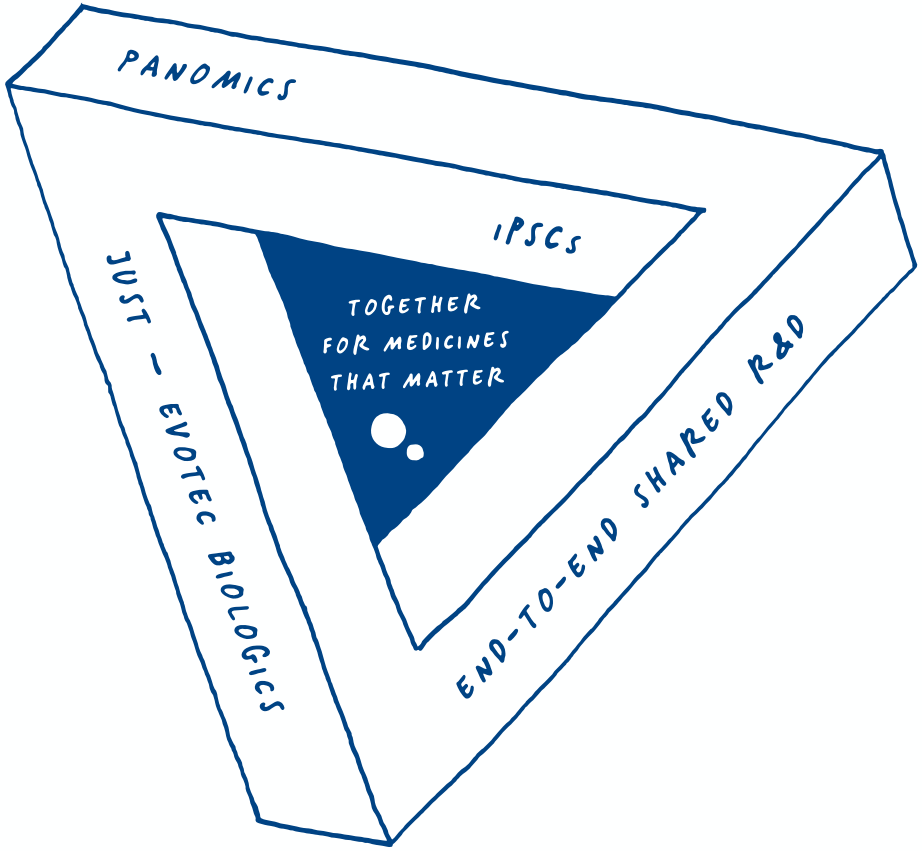
Evotec: Together for Medicine that Matter

Overview of Evotec Services



We aspire to impact patients' lives by

- **PanOmics**-driven drug discovery for deep disease understanding and effective therapies
- **iPSCs** "off-the-shelf" cell therapy based on induced-pluripotent stem cells
- **Just – Evotec Biologics**
  Artificial Intelligence and continuous manufacturing for better access to biologics
- **End-to-End Shared R&D**
  Integrated business-to-business platform for increased probability of success from target to the clinic

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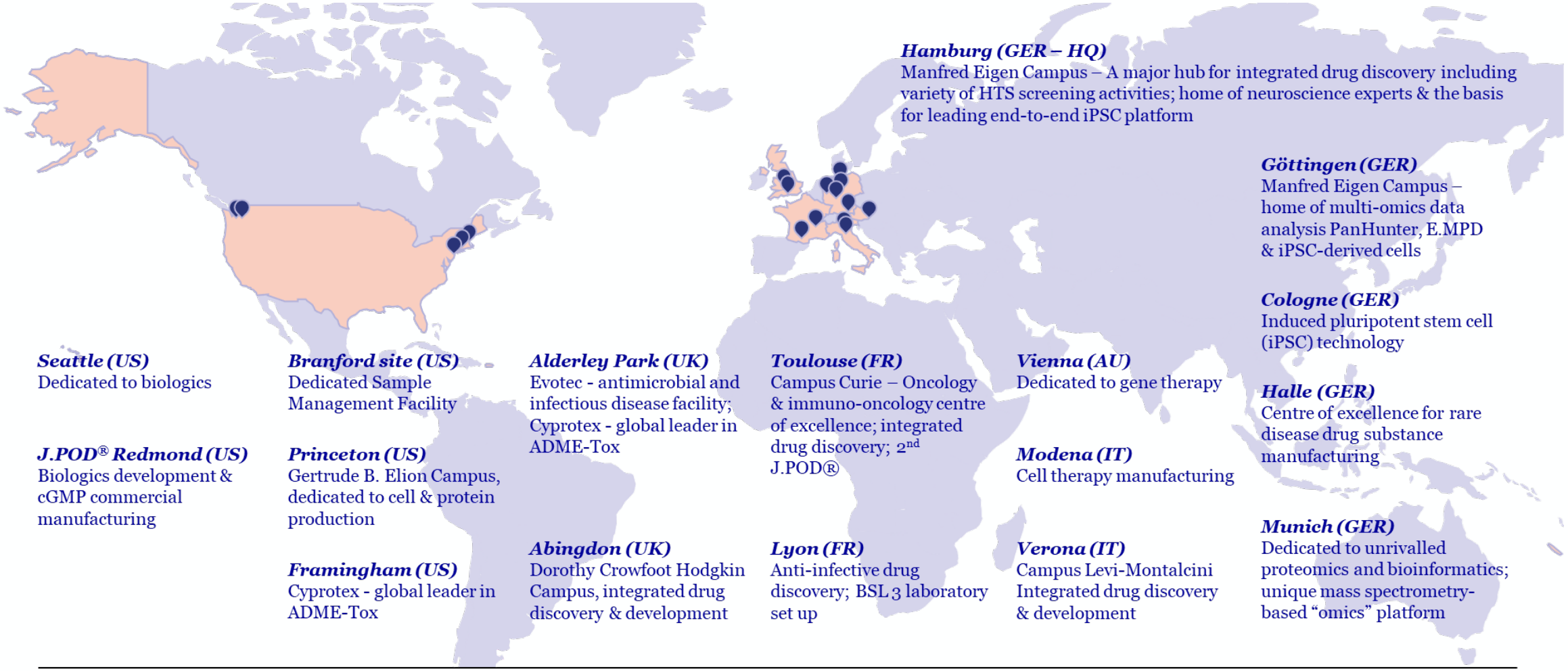
Evotec's R&D Sites



Hamburg (GER – HQ)
Manfred Eigen Campus – A major hub for integrated drug discovery including variety of HTS screening activities; home of neuroscience experts & the basis for leading end-to-end iPSC platform

Göttingen (GER)
Manfred Eigen Campus – home of multi-omics data analysis PanHunter, E.MPD & iPSC-derived cells

Cologne (GER)
Induced pluripotent stem cell (iPSC) technology

Halle (GER)
Centre of excellence for rare disease drug substance manufacturing

Munich (GER)
Dedicated to unrivalled proteomics and bioinformatics; unique mass spectrometry-based "omics" platform

Seattle (US)
Dedicated to biologics

J.POD® Redmond (US)
Biologics development & cGMP commercial manufacturing

Branford site (US)
Dedicated Sample Management Facility

Princeton (US)
Gertrude B. Elion Campus, dedicated to cell & protein production

Framingham (US)
Cyprotex - global leader in ADME-Tox

Alderley Park (UK)
Evotec - antimicrobial and infectious disease facility; Cyprotex - global leader in ADME-Tox

Abingdon (UK)
Dorothy Crowfoot Hodgkin Campus, integrated drug discovery & development

Toulouse (FR)
Campus Curie – Oncology & immuno-oncology centre of excellence; integrated drug discovery; 2nd J.POD®

Lyon (FR)
Anti-infective drug discovery; BSL 3 laboratory set up

Vienna (AU)
Dedicated to gene therapy

Modena (IT)
Cell therapy manufacturing

Verona (IT)
Campus Levi-Montalcini Integrated drug discovery & development

Committed to Science-based targets to mitigate climate change

Our near-term goals

Commit | Develop | Submit | Commu-nicate | Disclose

*Evotec SE commits to **reduce absolute Scope 1 and 2 GHG emissions 50% by 2032** from a 2021 base year. Evotec SE also commits to increase annual sourcing of **renewable electricity** from 25% in base year to **100% by 2026**. Evotec SE commits to **reduce Scope 3** GHG from purchased goods and services and capital goods **72% per revenue** over the same period. Evotec also commits that **80% of its suppliers** by emissions covering purchased goods and services and capital goods **will have science-based targets by 2027**.*[1]

Science-based targets balancing fast growth and responsibility for the planet

- RE100 by 2026 *(LTI goal 2023)*
- 50% reduction of Scope 1 and 2 emissions by 2032, despite disproportionately faster growth than industry average
- Evotec will act as multiplier with its supplier engagement program

1 Evotec's targets submitted on 2 Jan 2023

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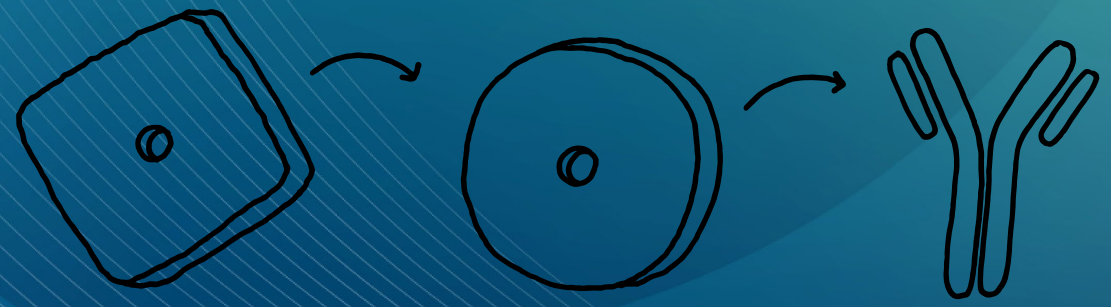
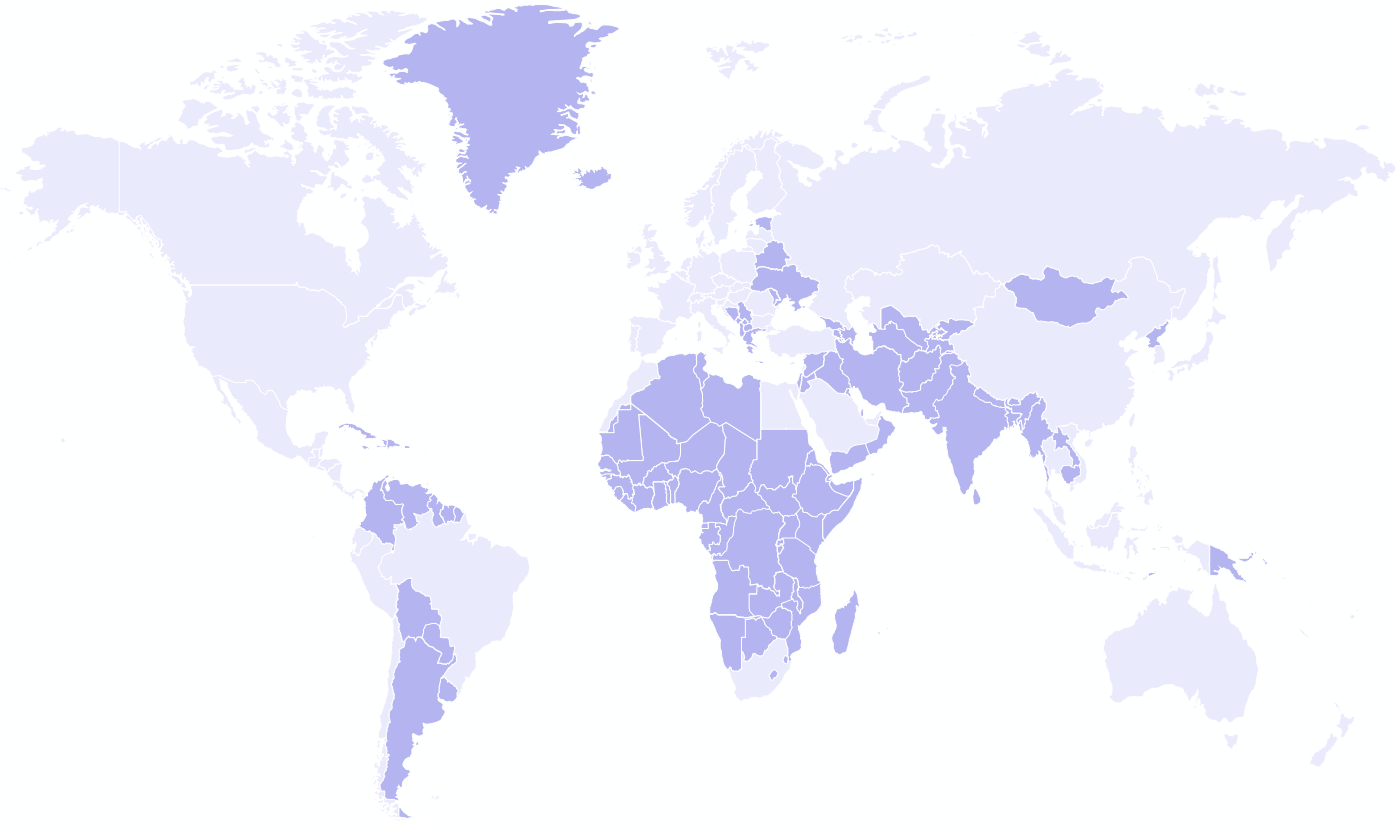
Better access for tomorrow



Continuous manufacturing for patient access

Case study – Countries where key PD-1 antibodies are currently not available



Source: IQVIA data from 2021

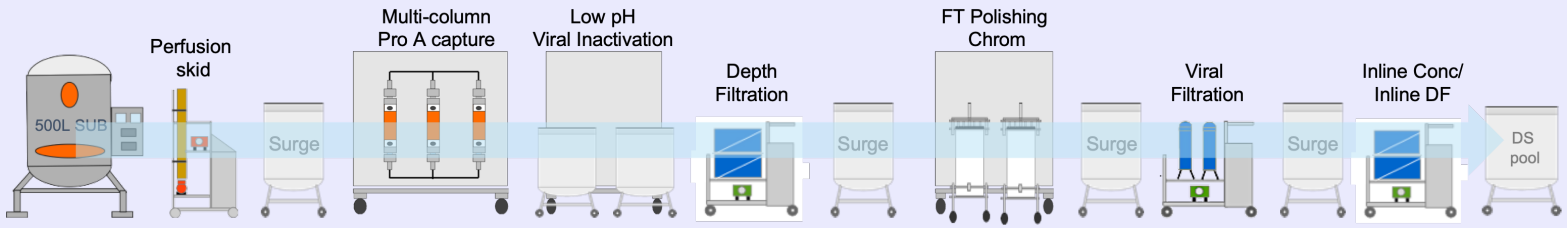
Highly intensified processing maximizes efficiency

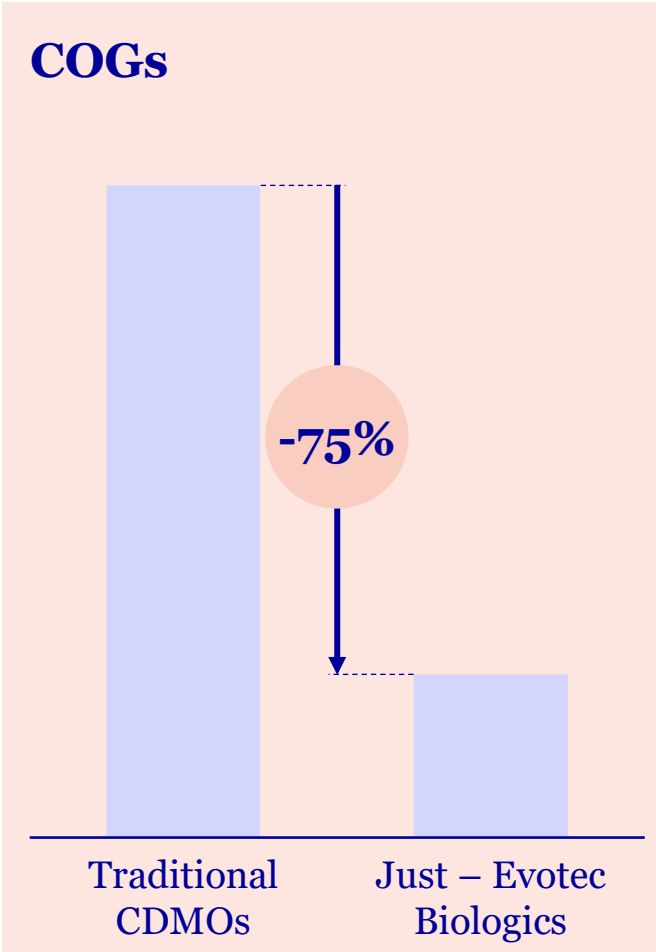
Reduces COGs but increases sustainability

Fully end-to-end continuous process for late-stage products

>25-day production

- COGS from 200 to 50 $/g
- Shorter switch between products



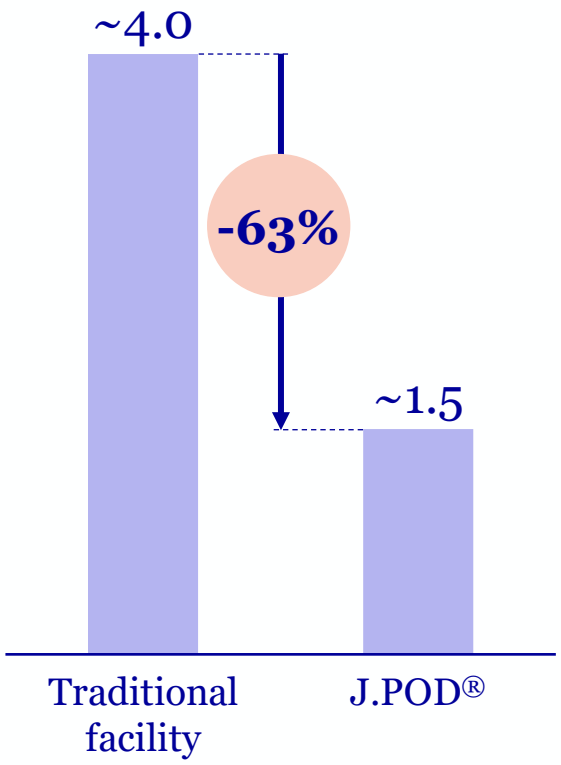


Continuous biomanufacturing is a flexible and agile approach

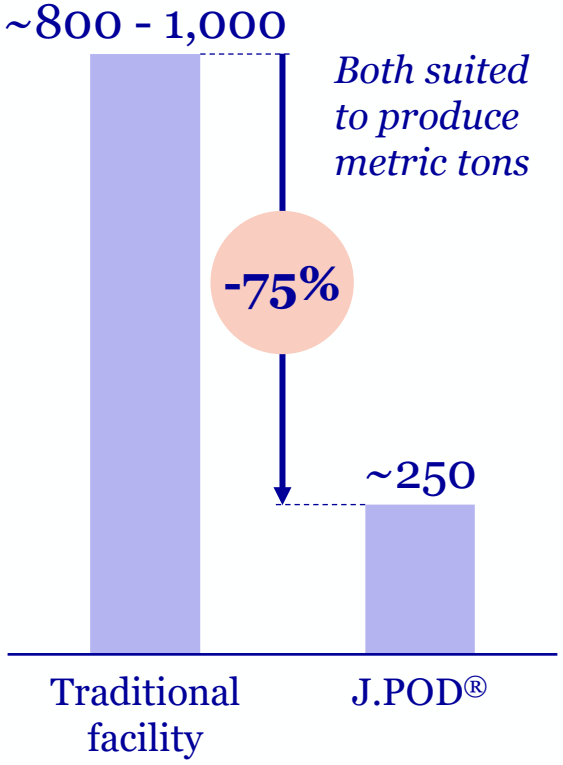
J.POD® – The physical expression of agility

- Reduced cost and time to set up facility
- More environ-mentally friendly versus traditional facilities due to avoidance of unnecessary steps
- Smaller footprint

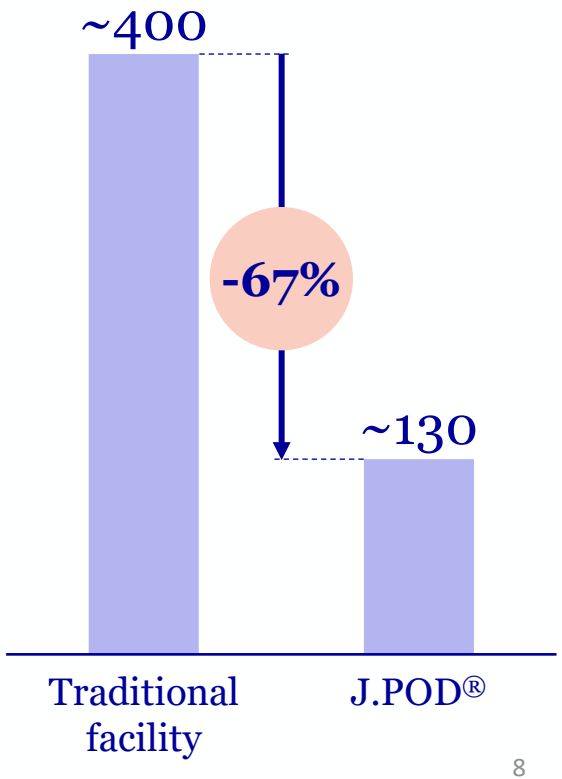
Time to set up a J.POD® is short, *Years*



Cost of a J.POD® facility, *US$ m*

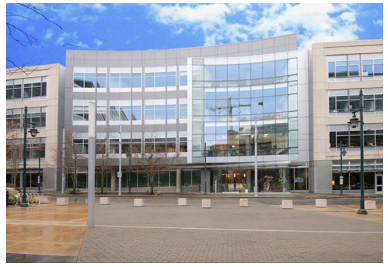


Smaller Footprint
Square feet x 1,000



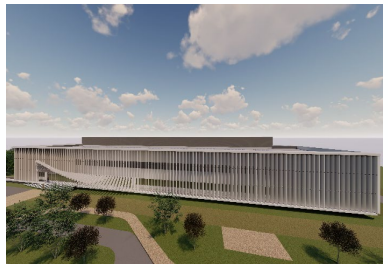
Our global network of facilities

Cloning of CM facilities – Status and timing

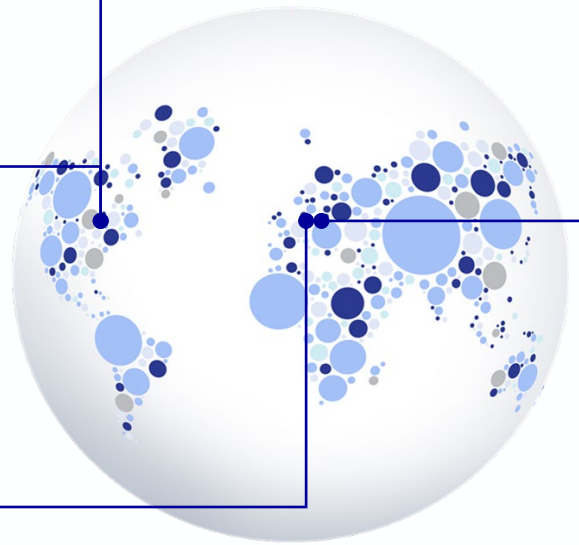


J.PLANT Seattle, Washington, US
- 500L SUB
- Phase I – Clinical
- Over 34 runs
- 100% success years

J.POD® Redmond, Washington, US
- 500L & 1,000L SUB
- Phase I – Commercial
- First cGMP run Oct 2021



J.POD® Toulouse, France, EU
- 500L & 1,000L SUB
- Phase I – Commercial
- Groundbreaking 2022
- Expected CQV 2024



"S.POD" – Cloning of J.POD® facilities (option)
- 100% Sandoz-owned
- Just-Evotec Biologics "enabled" from design to technology

CM facilities are environmentally friendly

J.POD Toulouse's incorporated key LEED[1] principles

Submitting J.POD Toulouse for LEED Silver certification

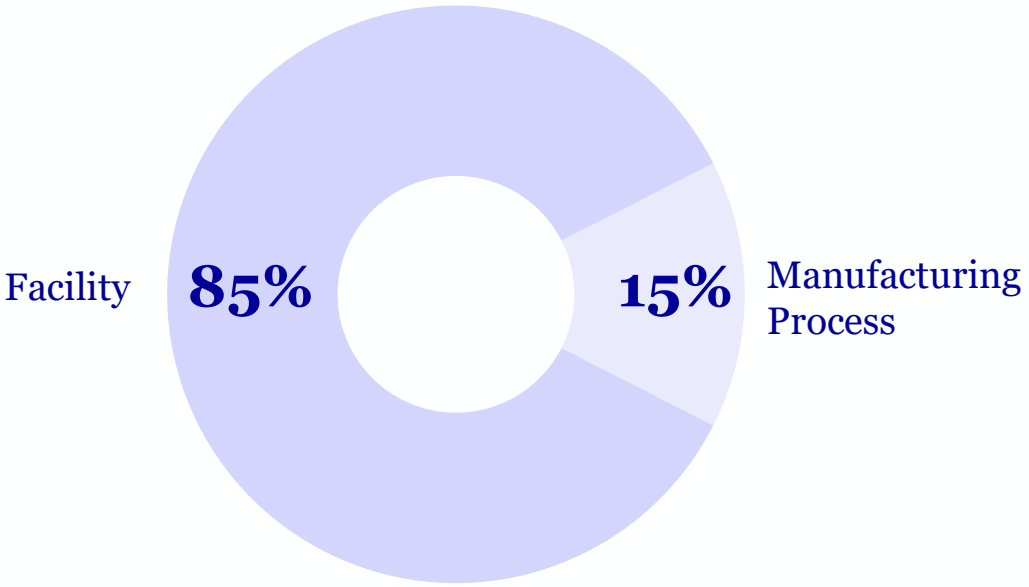
Key LEED elements

- Water usage reduced
  - No clean/steam in place = 50% less process water needed
  - Low flow fixtures for showers/restrooms; Aquasense faucets
- Sustainable building materials
  - Low-carbon concrete
  - Insulated aluminum panels
- Electrification/renewable energy
  - District heat
  - Solar panels on roof and parking lot
  - EV chargers

1 Leadership in Energy and Environmental Design

Plant design determines efficient energy use

Energy consumption of biologics manufacturing

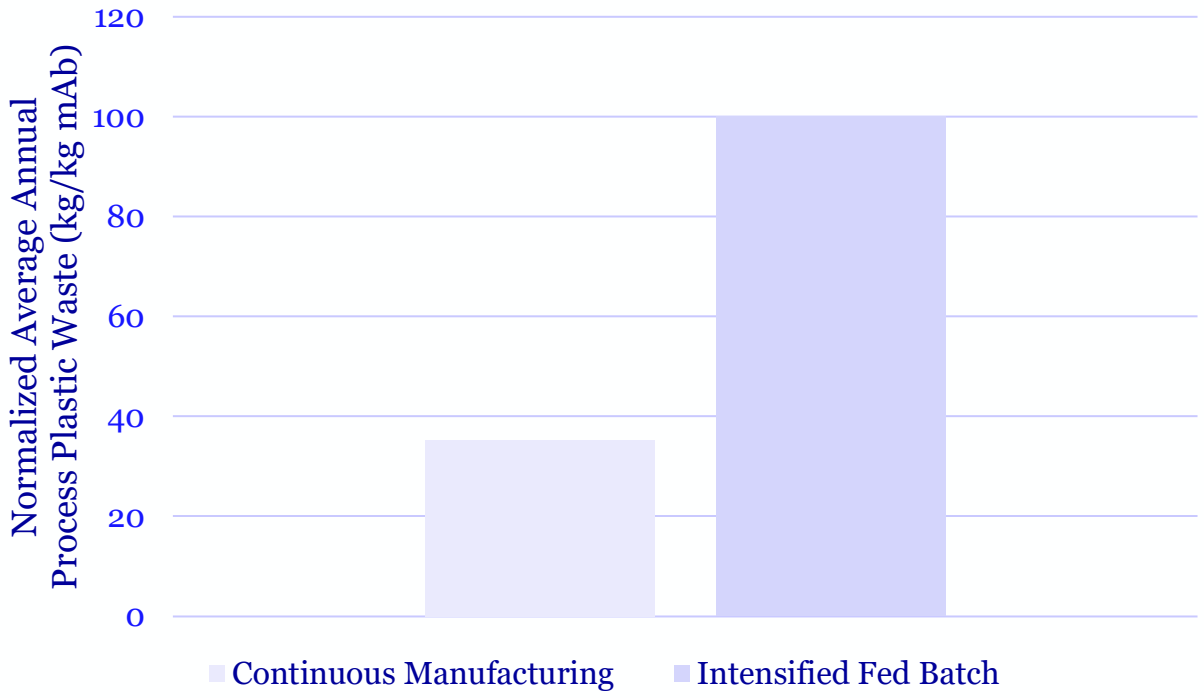


- Reduced facility footprint
  - Single Use systems eliminate clean/steam utilities & piping
  - Small cleanroom PODs reduce HVAC (Heating, Ventilation, Air Conditioning) energy demand
- Energy efficiency improved
  - WFI generated by electricity (membrane technology) rather than steam
  - Heat recovery boost energy efficiency by 90%
  - LED lighting and occupancy sensors
  - Right-sized air changes/hour in labs
- Right Energy mix
  - Washington leads electricity from hydropower[1]
  - J.POD TLS uses renewable energy heating network Toulouse Energie Durable (“TED”)

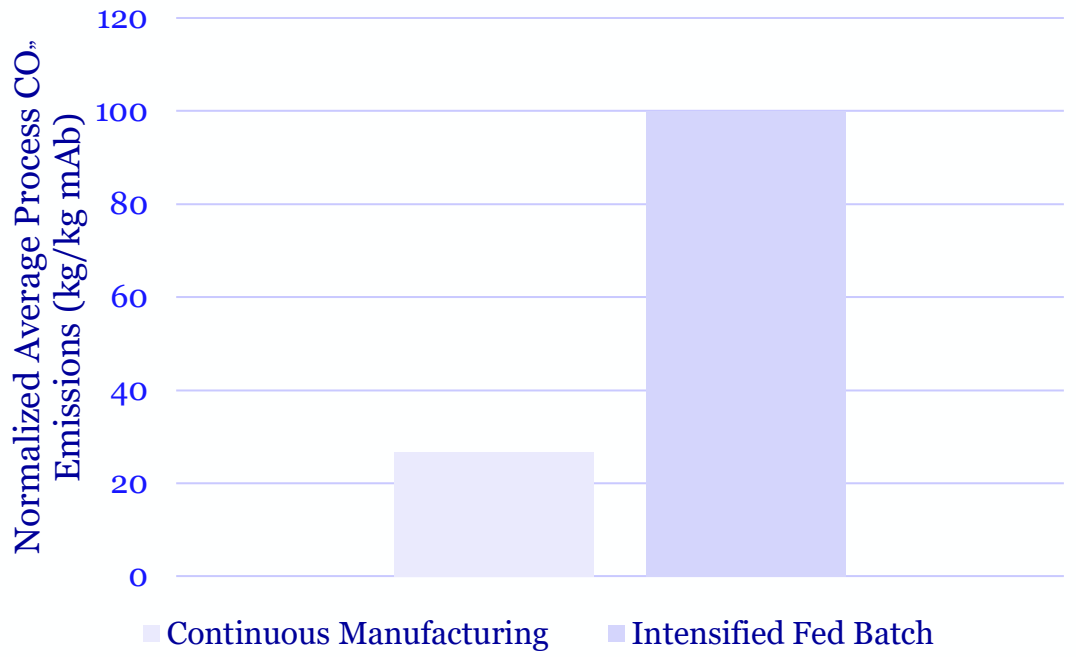
CM facilities are a sustainable biomanufacturing solution

Process intensification allows more product to be manufactured with less waste

Continuous manufacturing reduces process plastic waste by 65% compared to intensified fed-batch



Continuous manufacturing reduces CO_2 emissions by 73% compared to intensified fed-batch



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Together in collaboration for a better future

Just-Evotec Biologics memberships

NIIMBL

Members

- Industry
- Academia
- States
- NIST
- FDA
- MEPs
- MIIs
- NGOs
- NIH
- DOD
- BARDA
- Trade org.

Focus areas

Existing products
mAbs, proteins, vaccines
ADCs, bispecifics, virus-like particles

Emerging products
gene and cell therapies

Manufacturing process themes

Drug substance | Drug product | Process control

Impact

National

Growth of globally-competitive domestic industry

Regional economic development

Secure, integrated supply chain

Access to new and improved medicines

Industry

Flexible, adaptive manufacturing

De-risked manufacturing innovation

Lower costs

Accelerated development and approval

- The program provides scientists and the teams that support laboratories with actionable ways to make meaningful change. To date, My Green Lab has supported over 1500 labs in a range of sectors.
- My Green Lab Certification saves money and preserves resources while ensuring a safe, healthy, and fun environment

NIMBL
A public-private consortium dedicated to advancing biopharmaceutical manufacturing innovation.

my green lab.

Stericycle®
We protect what matters.

450 cu/ft plastic and 30 cu/ft of styrofoam /year

Source: Nimbl

Questions

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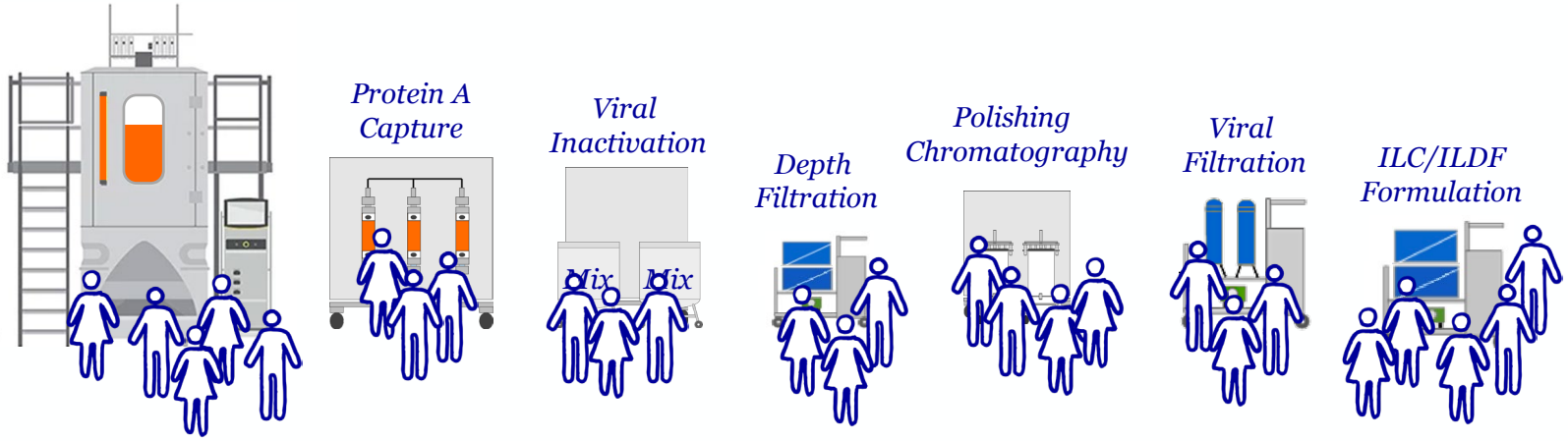
Aspiring "Lights-out manufacturing"

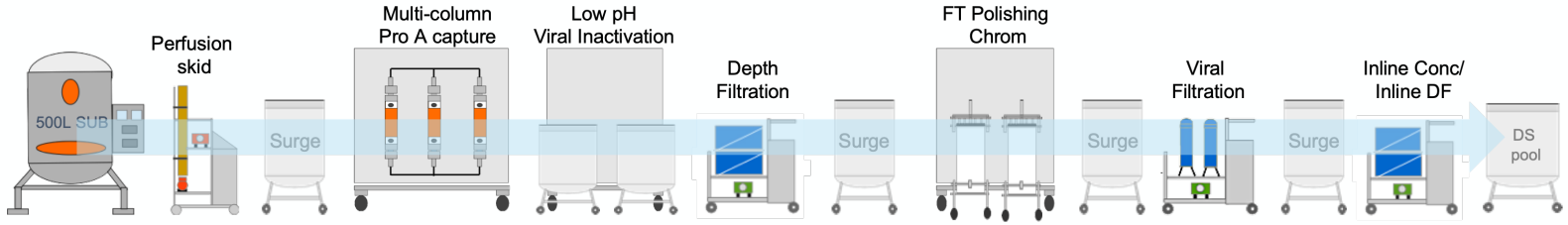
Less human intervention reduces risk of failure

Traditional fed batch



- Manual operations
- Each of the operations is an individual batch

Just EVOTEC BIOLOGICS



Highly connected and automated continuous process allows for

- Minimal intervention
- Remote monitoring