Bio Base Europe
Pilot Plant

Challenges in scale-up of industrial bioprocesses

Cell Factories for Industrial Bioproduction

30th March 2022

Nico Snoeck, PhD
Business Development Manager
nico.snoeck@bbeu.org

What is scale up?

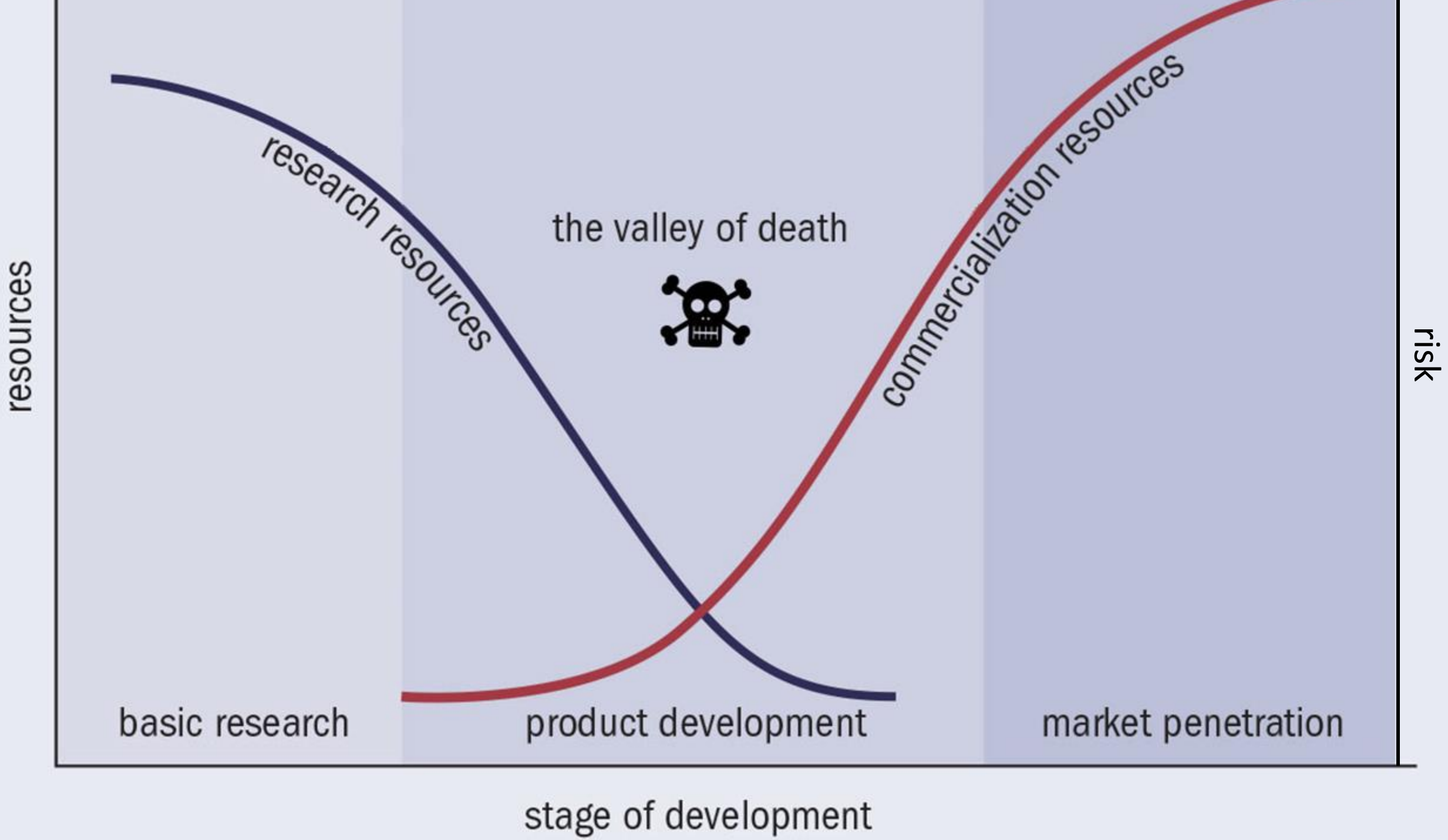
Going from lab …

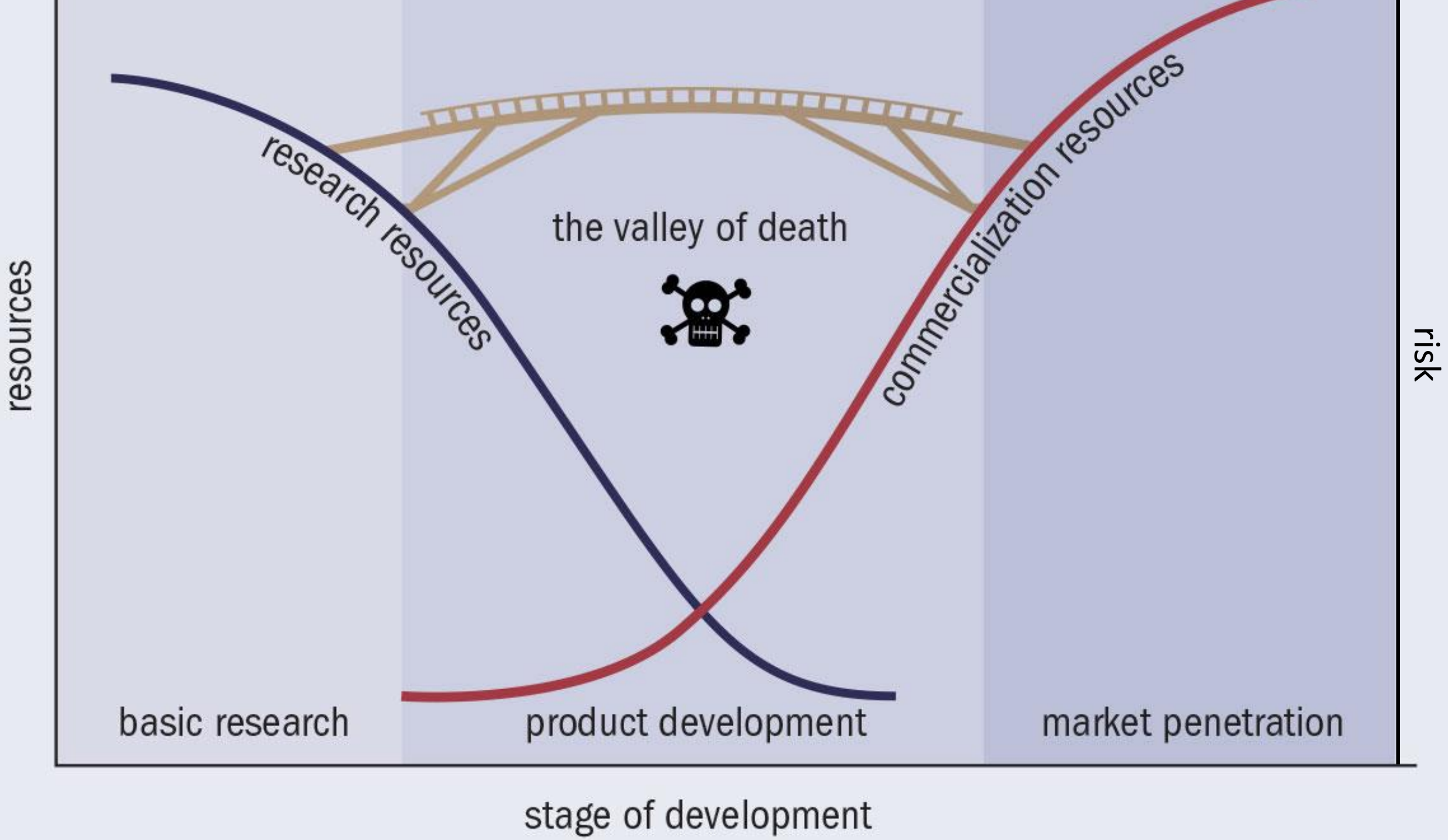
What is scale up?

… to industrial scale.

Why is scale-up difficult?

- Tank Aspect Ratio
- Pressure
- Oxygen Transfer Rate
- Feed rate
- Heat Transfer
- Mixing (speed, shear)
- Foaming


resources
research resources
the valley of death
commercialization resources
risk
basic research
product development
market penetration
stage of development


resources
research resources
the valley of death
commercialization resources
risk
basic research
product development
market penetration
stage of development

Bio Base Europe Pilot Plant

Key Facts

- Open Access Pilot Plant
- Independent
- Service provider
- B2B & Consortia
- Ghent, Belgium

Bio Base Europe
Pilot Plant

Key Figures

- Founded 2008
- 137 employees
- >500 projects
- >200 companies

Bio Base Europe Pilot Plant

To enable the transition to a sustainable bio-based economy

through

Development, Scale-Up and Custom Manufacturing
of bio-based products and processes.

Bio Base Europe
Pilot Plant

BIOMASS

Pretreatment

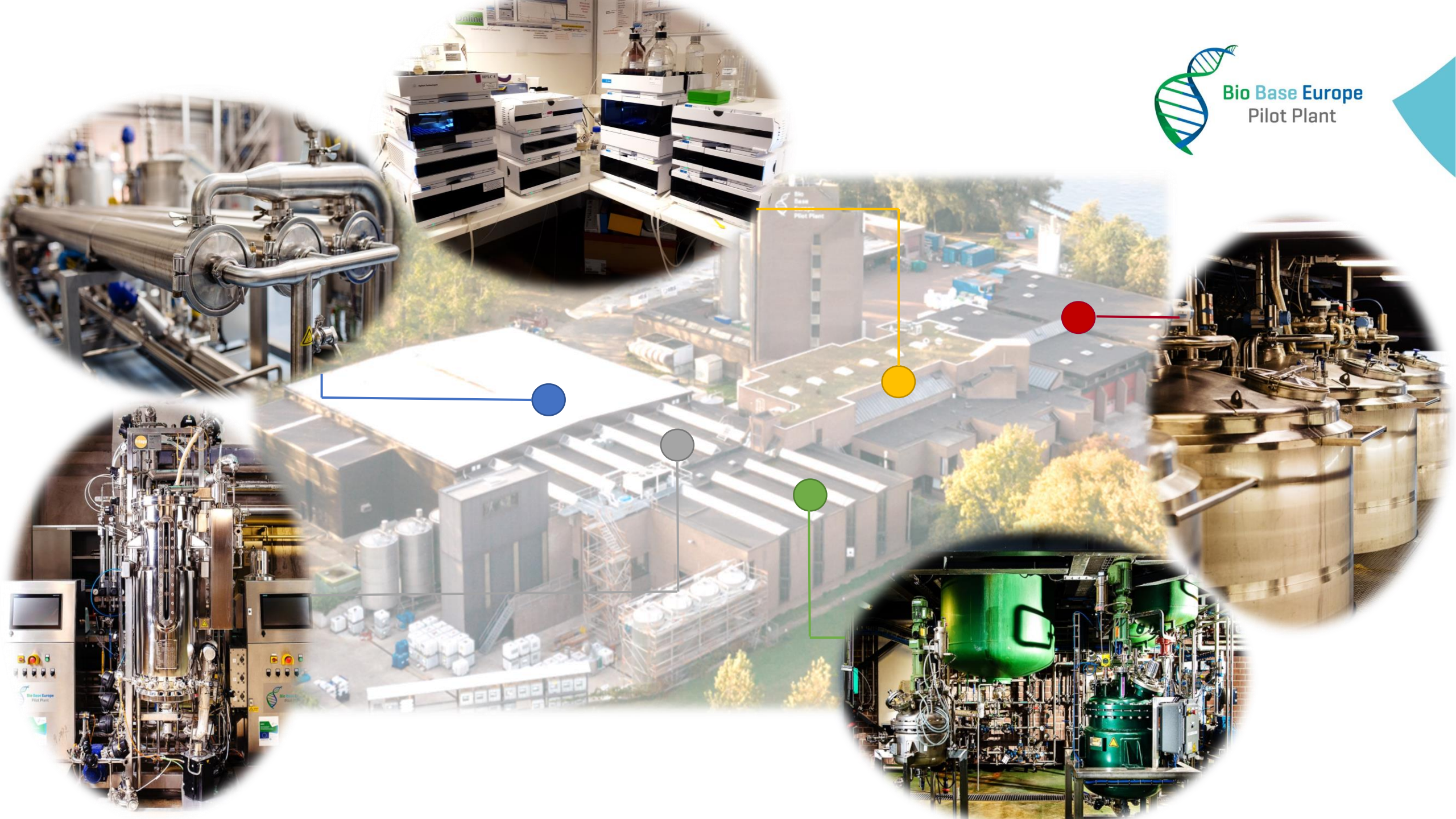
Biocatalysis

Fermentation

Green Chemistry

Downstream Purification

REFINED PRODUCT

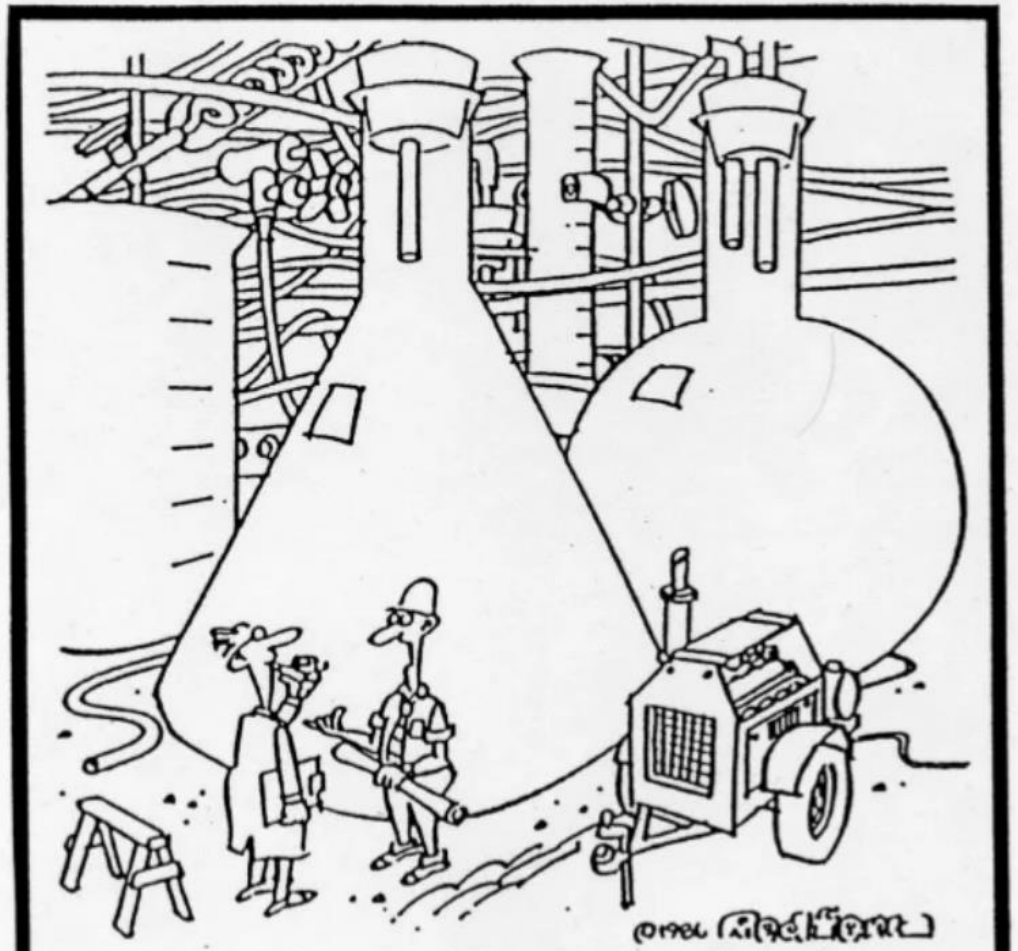

Bio Base Europe
Pilot Plant

Scale-up objectives?

Bio Base Europe
Pilot Plant

How to scale-up?

1. Choice of expression host
2. Choice of raw material and feedstock
3. Choice of appropriate equipment
4. Choice of unit operations
5. Evaluate robustness of your process
6. Find out critical process control points
7. Find out final product specifications



"Got a few problems going from lab scale up to full-scale commercial."

How to scale-up?

Bench scale

Development
Strain engineering
Parameter optimization
Feedstock selection

100L – 1 m³

Validation

1 – 10 m³

Demonstration
Sample production

10 – 50 m³

Demonstration
Market introduction

50 – 100+ m³

Production
Dedicated plant
CMO

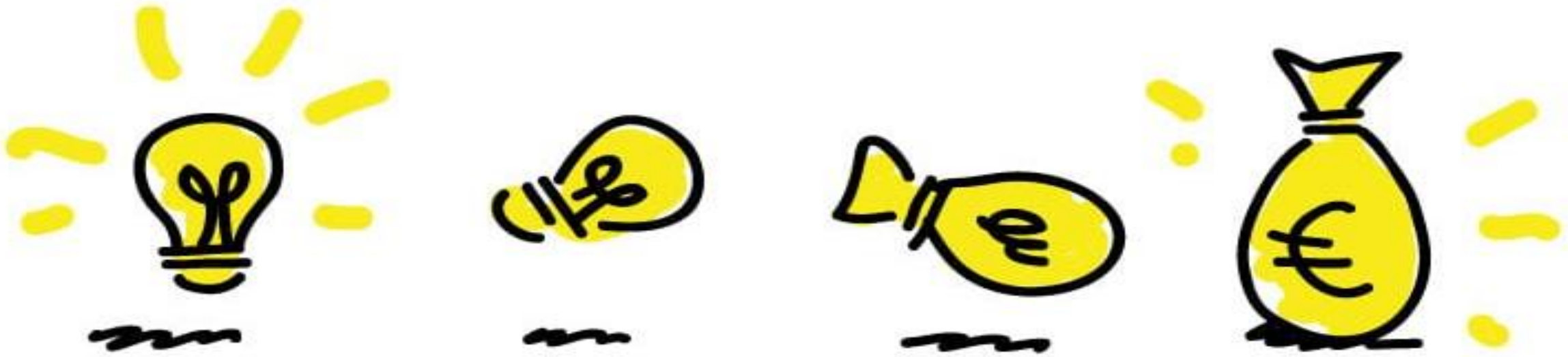
Derisk & downscale

Scale-up is teamwork

Bio Base Europe
Pilot Plant

Technology provider
- Scientific experts
- IP

CDMO
- Experienced personnel
- Equipment and know-how
- Network

Investors and funding agencies
- Business case
- Funds
- Marketing

Take home message