

Continuous Processing - How do we make it succeed in the Pharmaceutical Industry ?

RSC Speciality Chemicals Symposium 2011:
Continuous Flow Technology

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GSK R&D, June 2011

Starting Point – GSK 2010 Financials

£23.3 Billion Pharmaceutical Turnover

Cost of Sales = £7.5 Billion

30883 Staff in Manufacturing

**Pressure to reduce costs to
Patients and increase Return on
Investment**

What we want Continuous Processing to deliver

- **Quick/Responsive Factories** - Produces to pull of customer
- **Lean Manufacturing (low cost)**
 - Operational (direct/indirect costs)
 - Capital
- **High reproducibility/Quality**
- **Reconfigurable/Adaptable**
- **Sustainable**

Problem

- Many believe Continuous Processing will add value, **but....**
 - There is a real inertia in our industry:
 - Existing Infrastructure (Internal and outsourced)
 - Pressure to get products to markets quickly with low risk (real or perceived).
 - There are no complete “solutions” for CP
 - We work in silo’s

Solution

- 1. Value & Communicate the Prize*
- 2. Making the technology work by working together in Pre-competitive collaborations.*

1. Value & Communicate the Prize

There are 3 Core Value Propositions.

**Better
Chemistry**

**Simpler (Cheaper) Synthetic
Routes
Sustainable Processes
Safer Processes**

Factory of the Future

**Products in days
Configurable/Adaptable low
impact Factory
Technology not labour
intensive**

More Products of Value

**Control of Physical Form to
generate better Products.
Products maintained beyond
patent expiry**


Using the ability of Continuous Processing Equipment to better control time, temperature and pressure

Shorten synthetic route

Increase yield

Improve Safety

Improve Quality



£0.5-4M/year
per
application



Better
Chemistry

Factory of the Future

More Products of Value

End-to-End Manufacture

Reduce Labour/product
Recycle Raw Materials
Lower Working Capital
Reduce Energy Consumption
Reduce Capex



Step Change
in total cost
of production



Better
Chemistry



Factory of the Future



More Products of Value

More Products of Value

Particle Engineering

Lower dose

Improve delivery of drug

Improve stability

Customise to Patient



More
Products of
Value

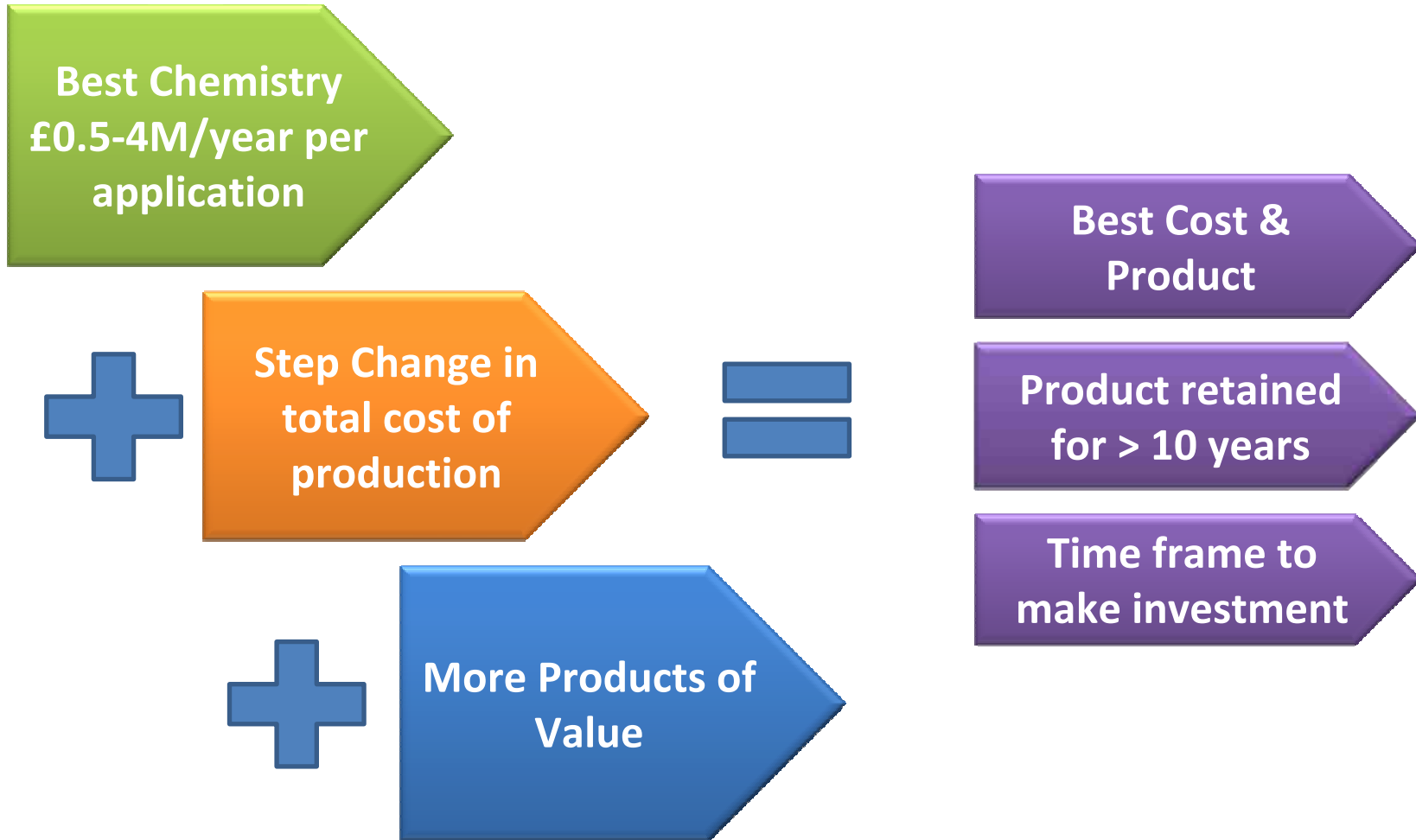


Better
Chemistry

Factory of the Future

More Products of Value

The End Game?



Making the Technology work - Collaboration

How much have we spent already ?

Total Pharma > £400M?

What ROI have we got for our individual contributions???

There are still barriers

Capital Cost

Continuous Separation Technologies

Solids Handling Technologies

Low energy cGMP Facility

Impact of Recycling on Impurities

Piloting Facilities

Regulatory framework for combined primary/secondary manufacturing.

What stops us collaborating?

Why Collaborate?

Doing nothing will lead lower margins, and lower ability to meet patient access to medicine needs.

Better Chemistry will deliver some improvements, but isn't game changing

Losing revenue post patent expiry is limiting leveraging the skills in product development through good science and engineering to step change a reduction of Manufacturing Costs

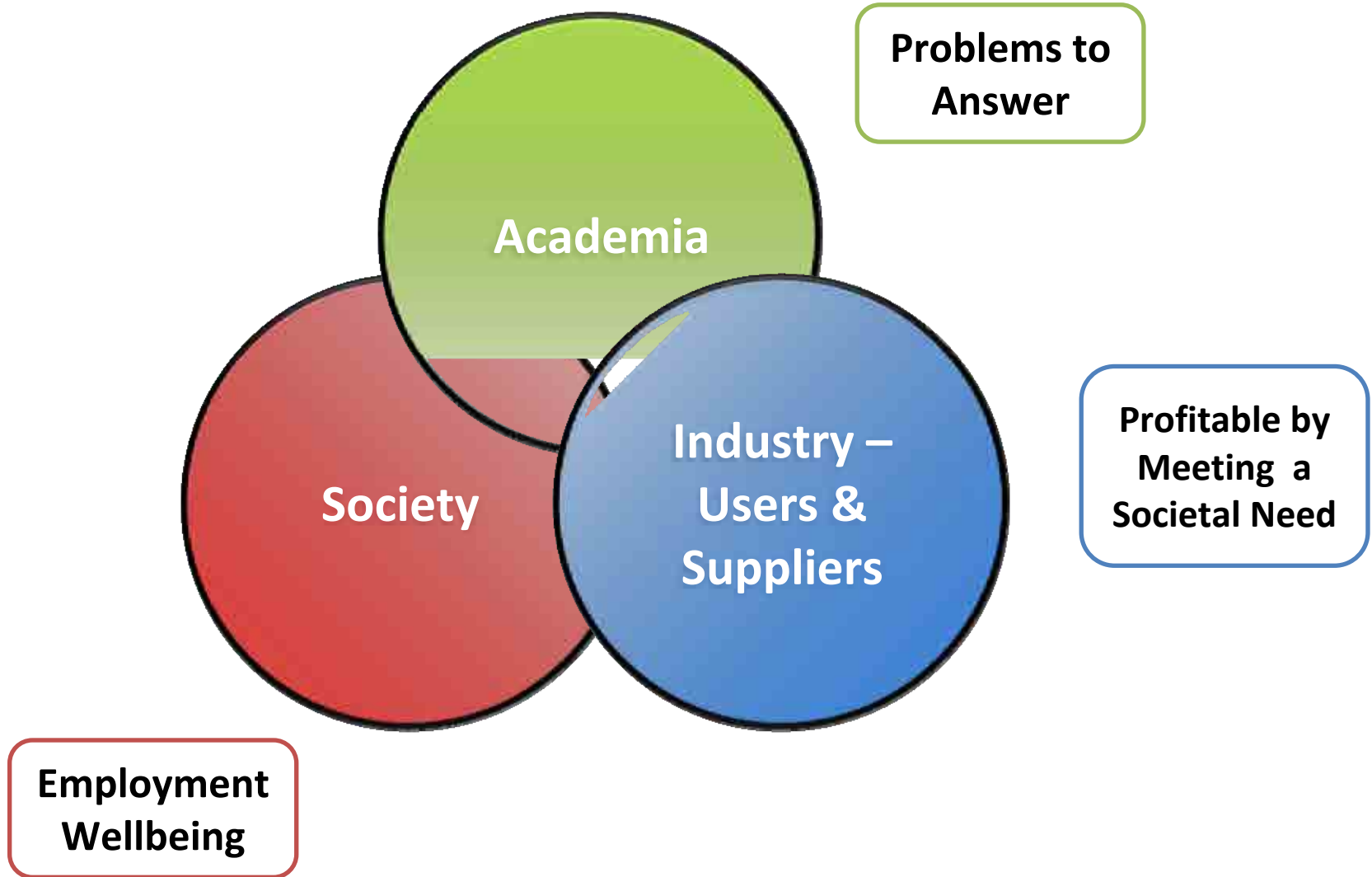
The effort (people and assets) to truly realise this vision of a robust future factory is:

Large for one company to bear

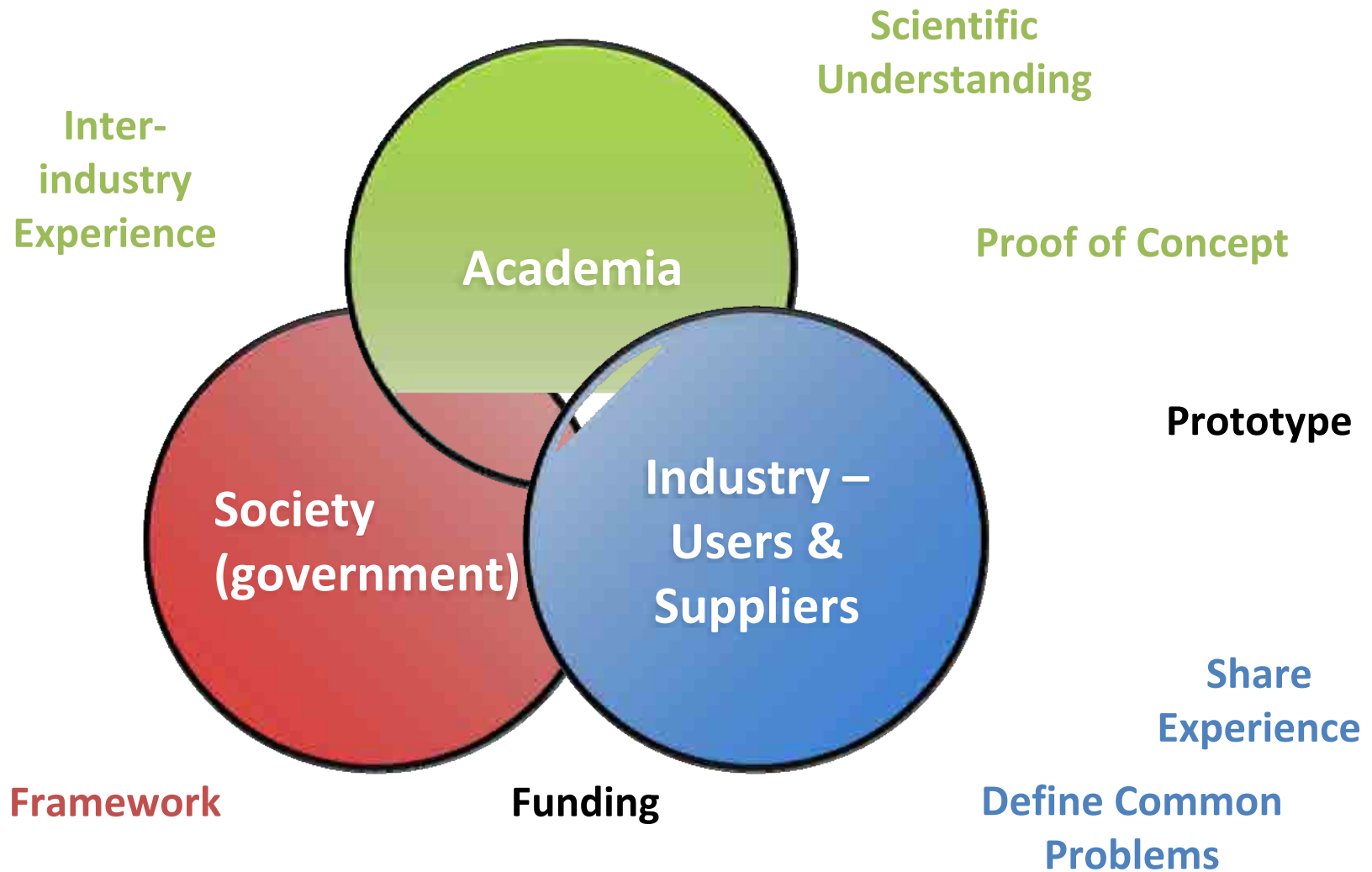
Outside the skill set of one company



Way Forward – Collaboration, what we want...



Way Forward – Collaboration, path to accelerated solutions



Any Questions ???
