



Australian Government

**Department of Industry
Tourism and Resources**

BIOTECHNOLOGY'S CONTRIBUTION TO THE AUSTRALIAN ECONOMY: UPDATE ON DEVELOPMENT AND IMPLEMENTATION

PRESENTATION TO

OECD Workshop on Biotechnology Outputs and Impacts

Kate Le Strange

Manager

Biotechnology Industry Development Section

11 December 2006



Proposed Methodology To Identify Biotechnology's Contribution To The Australian Economy

- To address the need for biotechnology statistics in Australia
- Commissioned in 2005 by DITR
- The consultants were:
 - ACIL Tasman (Denise Ironfield)
 - Innovation Dynamics (Lyndal Thorburn)
- The report was finalised in December 2005 and circulated for consultation.
- Thank you for comments



Australian Government

Department of Industry, Tourism and Resources

Information For Policy Needs

Understand the ways that biotechnology contributes to the Australian economy, now and in the future.



Information For Policy Needs

- Economic footprint of biotechnology
 - Industry characteristics (e.g. type of organisation and biotechnology)
 - Economic contribution (e.g. role in biotechnology value chain)
 - Sectoral and national picture
 - Spillovers/externalities (positive and negative)
- Economic impact of biotechnology (e.g. net benefits)
- Drivers and barriers to use and implementation of biotechnology in industry
- Extent of uptake by all sectors, now and in the future



Department of Industry Tourism and Resources set a scope broader than the OECD framework

- The OECD Framework for Biotechnology Statistics focuses on "key activities".
- End users are excluded
- Biotechnology is an enabling technology with a wide range of applications
- Contribution should be defined broadly and focus on use
- **DITR wanted to explore a methodology that would also capture END-USERS**



Key Components of the Proposed Methodology

1. Continued collection of **indicators**
2. Development of a methodology to **identify the biotechnology population** and **maximise benefits of existing ABS resources**
3. Development of a broad biotechnology **survey** framework
4. In depth, company- or technology- specific, **microeconomic analyses**
5. **Economic modelling**



3. Biotechnology survey

- A periodic biotechnology census is proposed
- A standardised questionnaire has been developed
- Design includes:
 - R&D performers, producers and USERS of biotechnology
 - by type of biotechnology activity



4. Company- specific microeconomic analyses (or economic case studies)

- These would assist to:
 - Identify a wide range of qualitative impacts
 - Identify the extent of gaps between private and social costs and benefits
 - Fill in data gaps identified through the regular census
 - Gather hard data to substantiate biotech's impacts on cost structure and efficiency



5. Economic modelling to identify biotechnology's contribution to the Australian economy

Many years away and dependent on implementation of the other statistical components.

1. Econometric modelling

- Would draw on firm based economic data identified by the biotechnology 'flags' included in surveys

2. General equilibrium modelling

- Outputs from surveys and case studies would provide inputs into GE models
- Would allow analysis of a range of "what if" scenarios at different times in the future, as well as the present



Biotechnology Statistical Users Group

- Committee co-chaired by Biotechnology Australia and the Australian Bureau of Statistics
- Purpose: to develop an Australian national framework for biotechnology statistics
- Commonwealth, State and Territory governments
- Industry association: AusBiotech
- Established in mid 2005 (CTE commenced January 2005)
- CTE and BSUG approach are complementary and we're working together



Biotechnology Statistical Users Group Information Development Plan

- Information Development Plan has been agreed
- Describes the Australian national framework for biotechnology statistics
- Has built on the OECD framework

- Executive summary available
- Full document available early 2007



Definition of Biotechnology: Extending the List

- Extending the list-based definition
- Addition of techniques that have gained prominence (May 2006 NESTI proposal for public R&D)
- Separately list techniques of particular prominence in Australian biotechnology activities



Definition of Biotechnology: Extending the List

- DNA/RNA
- Proteins and other molecules
- Cell and tissue culture and engineering
- **Bioremediation**
- **Biosensing**
- **Other** process biotechnology techniques
- Gene and RNA vectors
- Bioinformatics
- Nanobiotechnology
- **Metabolomics/ metabonomics**
- **Systems biology**
- **Synthetic biology**
- **Biological control**
- **Biodiscovery**
- **Other**



Definition of Biotechnology: Biotechnology-Related

- A policy need to capture activities that do not fall within the current OECD definition
- Do so in a way that still allows international comparison
- Capture such activities under a new category: Biotechnology-Related



Definition of Biotechnology: Biotechnology-Related

- Medical devices
- Pharmaceuticals
- Diagnostics
- Nutraceuticals and Functional Foods
- Biofeedstocks for energy, chemicals and materials production



Australian Government

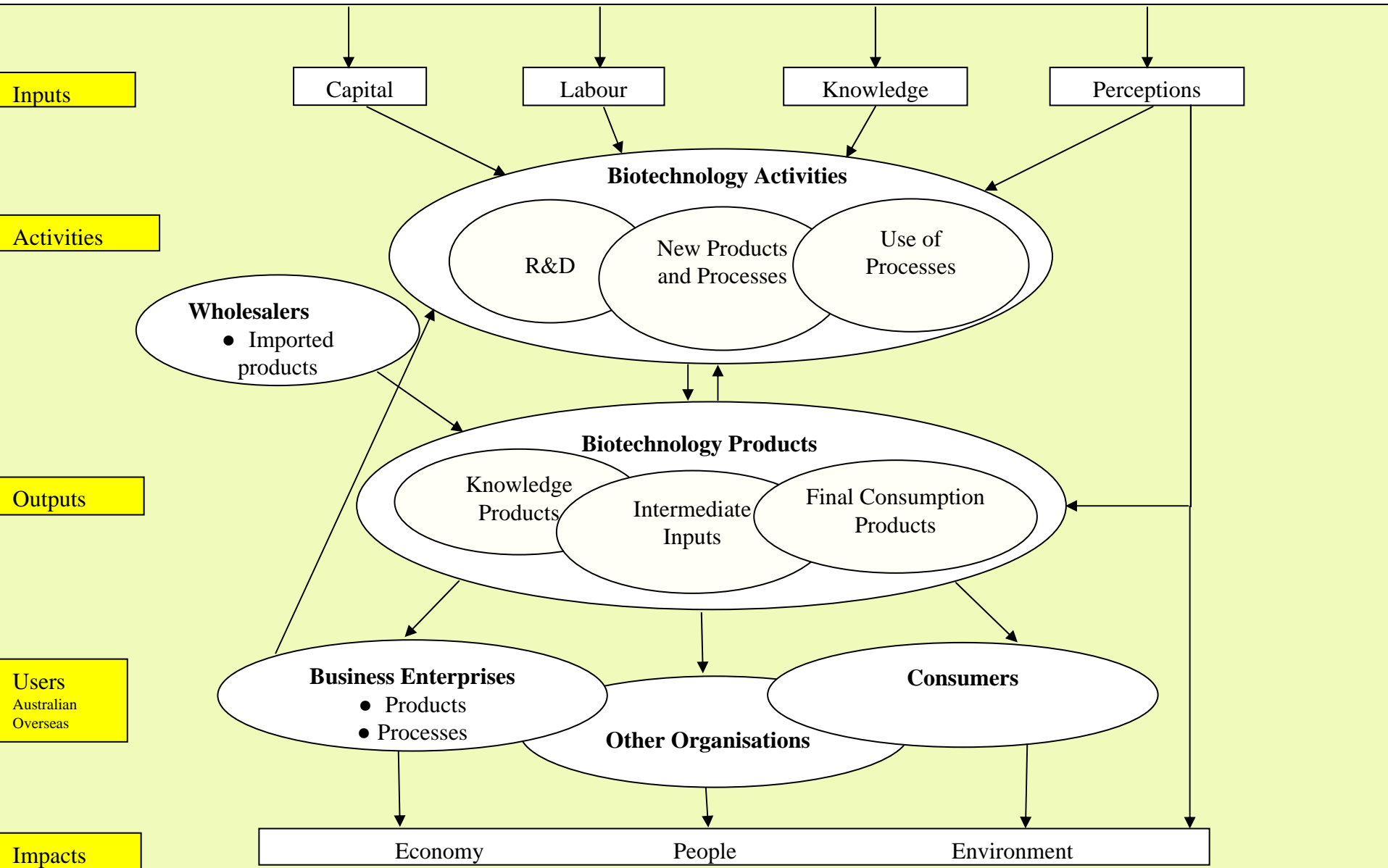
Department of Industry, Tourism and Resources

Australia' National Framework for Biotechnology Statistics

Conceptual Model

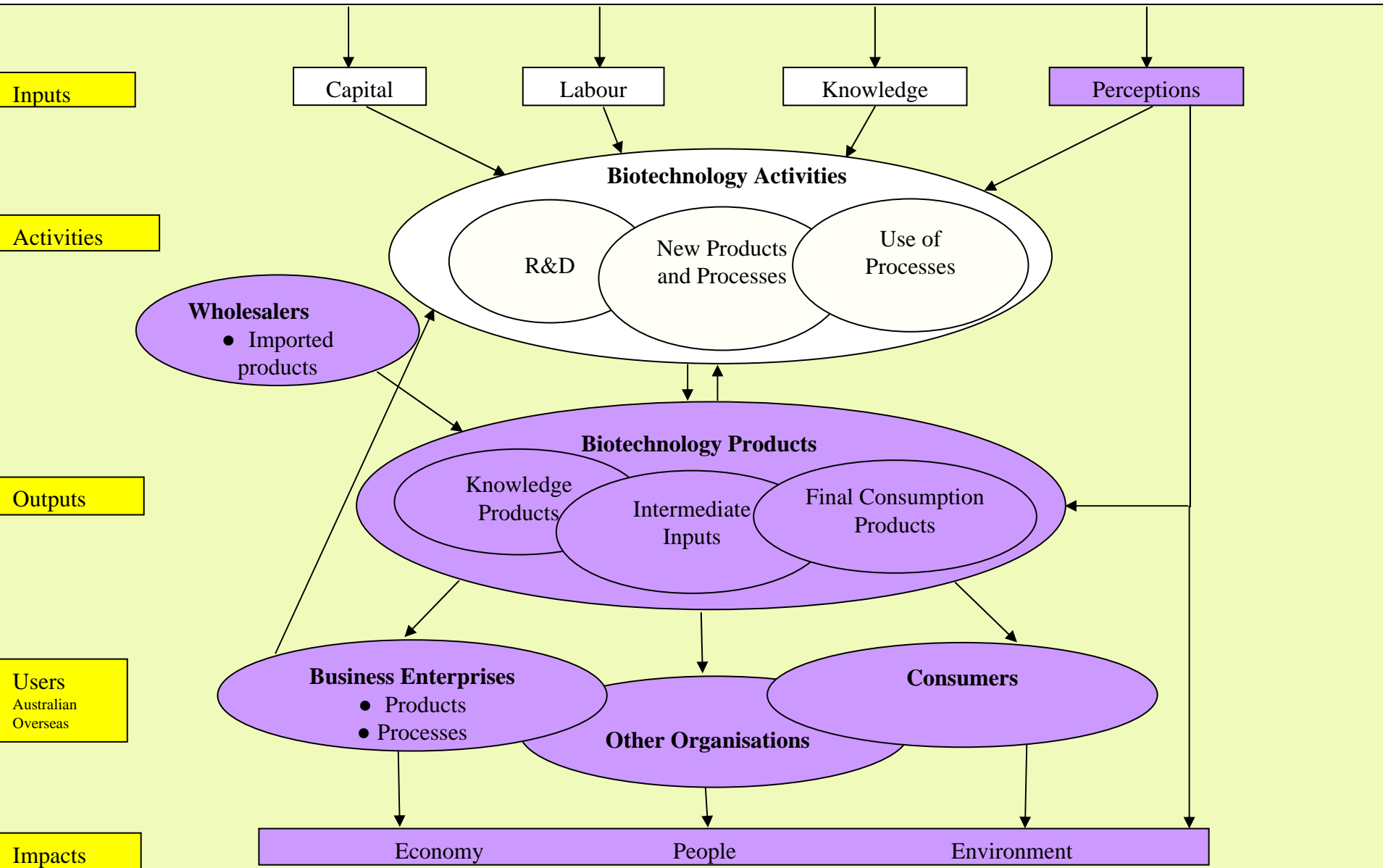
Statistical Entities Involved in Biotechnology in Australia

Govt. Orgs, Higher Education Orgs, Business Enterprises, Private non-Profit Orgs, Overseas Orgs, Aust Population



Statistical Entities Involved in Biotechnology in Australia

Govt. Orgs, Higher Education Orgs, Business Enterprises, Private non-Profit Orgs, Overseas Orgs, Aust Population





Highest Policy Priorities Include:

- Better understand the **social, health, environmental and economic impacts** of biotechnology in Australia including on individual industries, states and regions - especially rural areas
- Identify and understand the **drivers and limiting factors for the adoption and use** of biotechnology products and processes



BSUG Implementation Plan

Stage 1: develop a biotechnology survey 2006-07

Organisations known to be:

- dedicated biotechnology
- biotechnology active
- biotechnology-related
- users

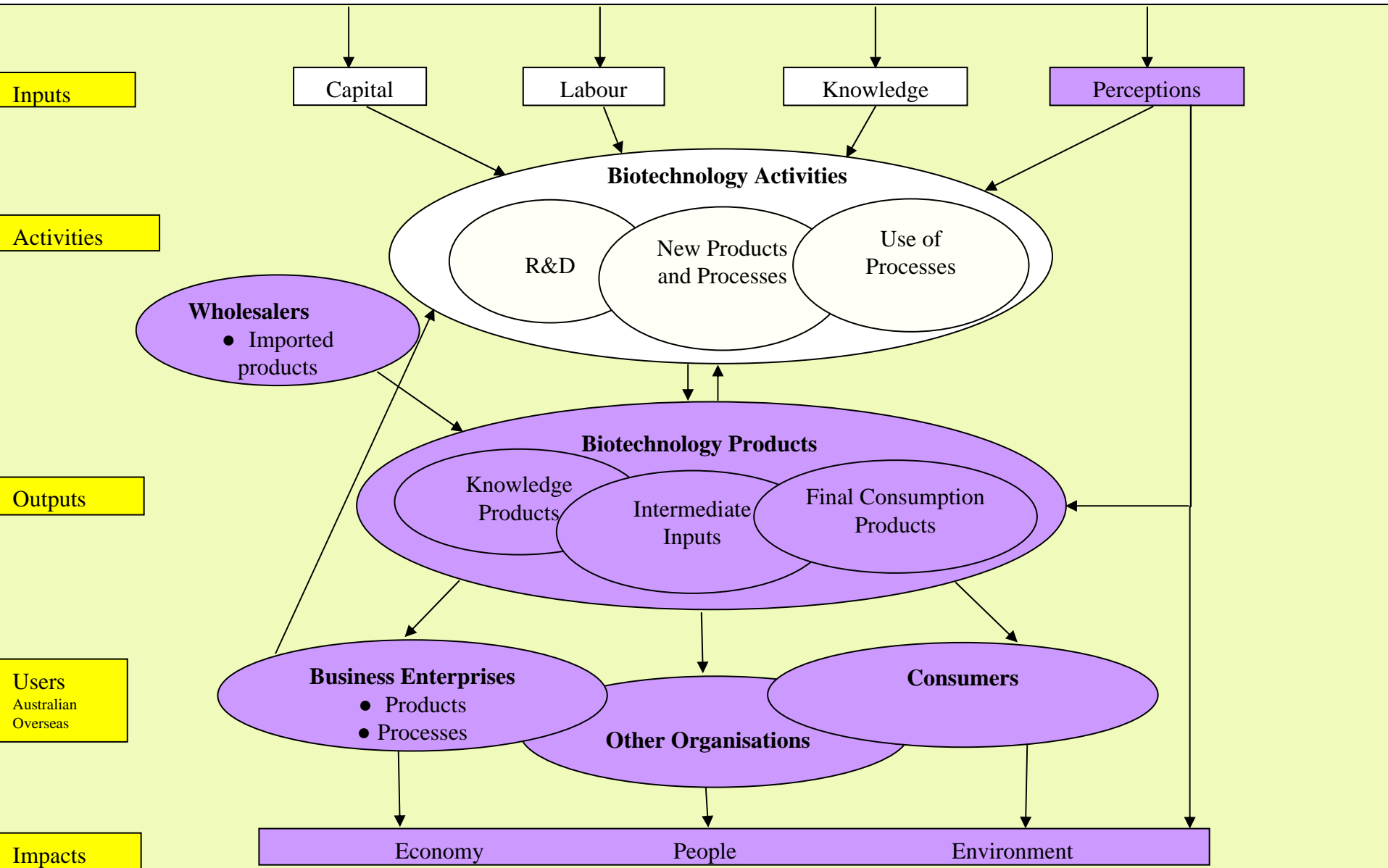
Stage 2: add targeted questions to economy wide surveys by ABS 2007-08

Help to identify users

Stage 3 and 4: progressively add biotechnology questions to ABS collections 2009-14

Statistical Entities Involved in Biotechnology in Australia

Govt. Orgs, Higher Education Orgs, Business Enterprises, Private non-Profit Orgs, Overseas Orgs, Aust Population





DITR's Current Work on Implementation

Develop a list of organisations to be surveyed

- dedicated biotechnology
- biotechnology active
- biotechnology-related
- users

Currently 1900 entries

Experimental National Biotechnology Survey

- In conjunction with Biotechnology Australia
- Consistent with the agreed national framework
- Consultant engaged by end of 2006
- **Data by end of 2007**



DITR's Current Work on Implementation Framework for Microeconomic Analyses (Case-Studies)

- To collect firm-level data on **adoption** of biotechnology
- Developing a generic framework
- Consultant engaged by end of 2006
- **Test case-studies in 2007**
- Focus on industrial biotechnology



Summary 1

- **DITR has proposed a methodology for measuring the impacts of biotechnology (CTE)**
- **An Australian national framework for biotechnology statistics has been agreed**
- **Builds on OECD Framework and CTE**
- **Expanded framework includes outputs, users and impacts**



Summary 2

- **2007: 1st Australian Experimental National Biotechnology Survey commissioned by DITR with Biotechnology Australia**
- **2007: First Microeconomic Case-Studies of Biotechnology Adoption**
- **For information or comments**
biotechnology@industry.gov.au