

MSc in the Management of the Bioeconomy, Innovation and Governance (BIG): An Interdisciplinary Programme to Meet the Needs of the Bioeconomy'

Dr James Mittra (Programme Director)
University of Edinburgh, James.Mittra@ed.ac.uk



The Open University



MSc BIG and the University of Edinburgh

- MSc BIG is based in the Science, Technology and Innovation Studies (STIS) subject group at the university of Edinburgh, which is part of the School of Social and Political Science
- It is a one-year (full time), two-year (part time) interdisciplinary programme that draws on expertise and courses across Edinburgh's Schools and Colleges (linking science and social science in new ways)
- Fees are £11,000 (Home/EU) and £16,500 (Overseas) and Programme has 12 students (2015/2016)



History of MSc BIG

- In June 2011 we organised a series of workshops with key opinion leaders from science and technology education, innovators, venture capitalists and policymakers, on behalf of the Scottish Scientific Advisory Committee, to look at the challenges and opportunities of the bioeconomy and identify where new skills were needed.
- Conclusion: neither PhD programs nor MBA programs were effectively training people to work in life science companies and policy sectors, which was also recognised by organisations such as the OECD



Market Research

- Various MSc programmes in Biotechnology in Europe and North-America
- Standard focus: providing scientists with business/commercialisation skills (i.e. basic accountancy, project management, business plan development, entrepreneurial competencies) alongside scientific skills
- But what about?
 - Linking new theory with practical applications across the whole bioeconomy (health, agriculture, and environment)
 - Regulatory, governance and policy impacts on innovation
 - Practical skills in technology foresight
 - Value chain and ecosystem level analysis

MSc BIG Builds on the Leading Research of the Innogen Institute.



- The Innogen Institute (formerly the ESRC Innogen Centre) conducts leading interdisciplinary research with global impact on the social and economic aspects of the life sciences and emerging technologies in both developed and emerging economies
- We developed a unique set of interdisciplinary methods and skills over the past decade (particularly foresight and strategic analysis that combines qualitative and quantitative approaches)
- Our research focuses on the interactions among three constituencies, (i) *Science and Innovation Communities*, (ii) *Policy Makers and Regulators*, and (iii) *Citizens and Stakeholder Groups*
- Integrative approach applied to innovation systems to a range of application areas in health, food, and environment.



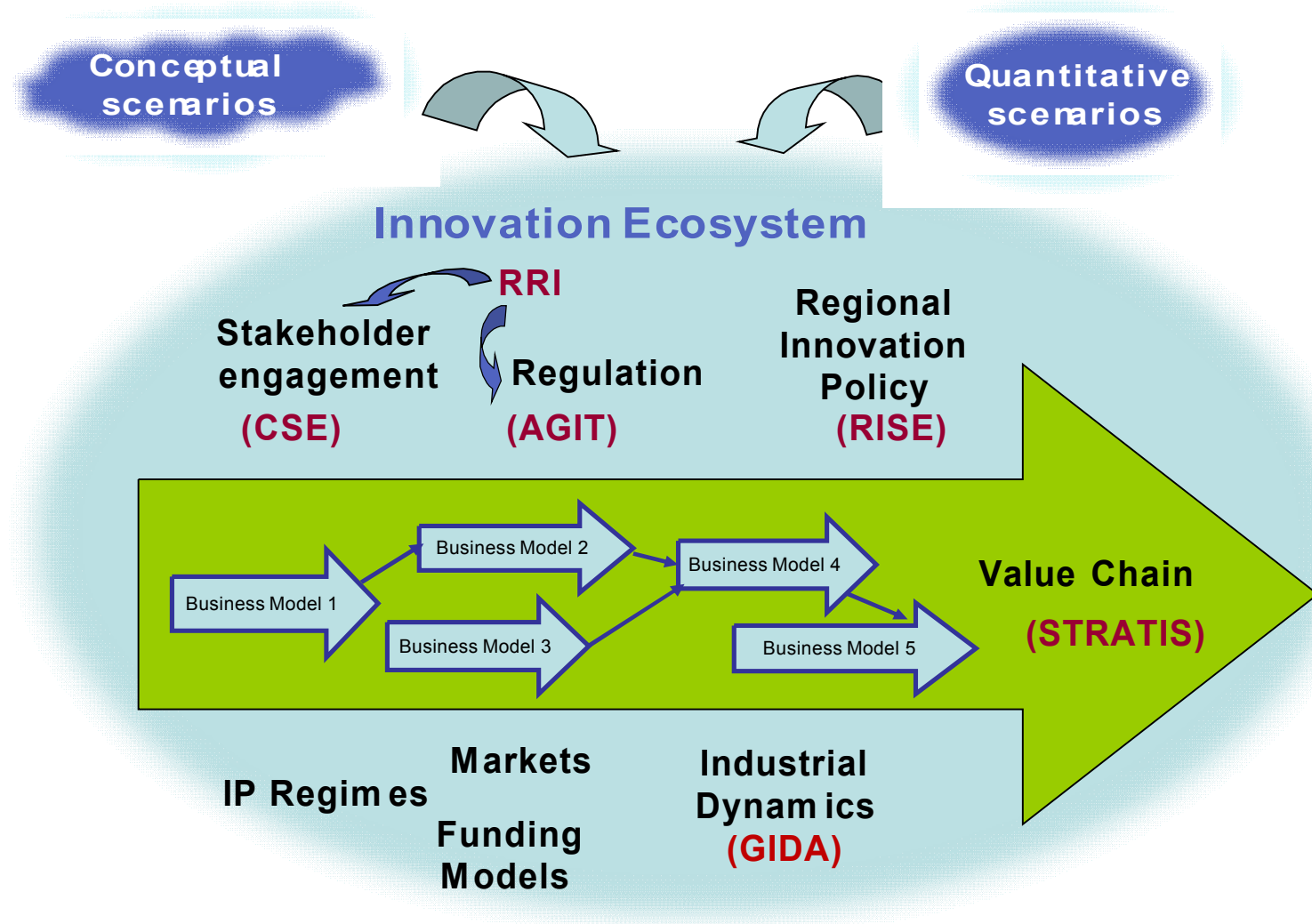
innogen

Cont'd

- Innogen has conducted research on the bio-economy at regional, national, and international levels and focuses on three important questions :
 1. How can life science innovation be used to promote **economic growth** and well-being?
 2. How can **innovation in the life sciences** transform **global health, agricultural systems**, and contribute to **environmental sustainability**?
 3. How can changes in the **regulation, governance** and **policy** around life sciences shape innovation processes to meet the challenges of the 21st Century bio-economy?



Innogen's Methodological Approach



Aims and Objectives of MSc BIG

- To provide students with a broad range of knowledge and skills about life science innovation, as desired by employers in the public, private and not-for-profit sectors.
- Graduates excel in strategic and critical thinking that brings globally contextualised solutions to practical problems relating to:
 - Innovation and firm Strategy
 - Policy, regulation, and stakeholder Engagement
 - New collaborative R&D models
 - Governance and intellectual property
- Programme (team taught and also involving guest speakers from industry and policy) combines theoretical perspectives on life science innovation with a practical focus on the dynamics of the bioeconomy and its value chains.
- Students benefit from the programme's proximity to world leading science and social science, and use of exemplar case studies from Innogen research



Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
Analysis and Shaping of the Bioeconomy (10credits)				Bio-Business (20cr)				Dissertation (60 credits)			
Block 1											
Innovation Systems Theory & Practice (10credits)				Innovation in Sustainable Food Systems (20 credits)							
Block 2											
Introduction to Risk, Regulation & Governance (10credits)											
Block 1				Selected Optional Courses Energy, Policy and Politics Product Development Social Dimensions of Systems and Synthetic Biology Controversies in Science and Technology Health Systems Strengthening and Reform Developing and Evaluating Complex Public Health Interventions Commercial Aspects of Drug Discovery							
Regulation & Governance of the Life Sciences (10credits)											
Block 2											
Selected Optional Courses:											
Economics and Innovation in the Biotechnology Industry											
Science, Knowledge and Expertise											
Globalisation and Public Health											
Infectious Disease and Global Governance											

Dissertation

- The dissertation is an extended piece of writing of up to 15,000 words, based on independent study of a topic largely of the student's choosing. It tests students' ability to conduct research autonomously, to organise effectively bigger quantities of information and to communicate their research findings in a fluent and structured fashion.
- MSc BIG is flexible in ensuring dissertation topics support student's interests. We can facilitate projects focused on all sectors of the bioeconomy, and welcome conventional scholarly dissertations, work-based projects, and pilot projects linked to Innogen interests.
- Work-based dissertations: Based on interactions with an organisation through a placement that involves physical co-location with the host, or consultancy work for an external organisation.

Work-Based Dissertation Examples

- Celtic Renewables: Student conducted a feasibility analysis report for Celtic Renewables that evaluated the economic potential of exploiting their existing IP to add a paper processing plant into their whisky to biofuel plant.
- A placement with the Strategy & Innovation department of KLM Royal Dutch Airlines. Over a course of three months, the student worked on a project dealing with the creation of an investment fund focused on feedstock technology.
- Student developed a Cost Effective SME Foresight Process for a Californian health biotechnology company looking to enter the European Market
- A comparative case-study examining Edinburgh BioQuarter's university-Technology Transfer Organization model with that of a public company.

Funding/Scholarships

- **2 Innogen Scholarships** (each worth £2000 reduction in fees; likely to be £10,000 in 2016). Open to both Home/EU and Overseas Students
- **2 Highly Skilled Workforce Scholarships** (full fees): These are provided by the Scottish Funding Council (SFC) and are open to all UK nationals who are permanently domiciled in Scotland, as well as EU nationals (excluding rest of the UK).

Student Profiles

- Undergraduate scientists who want to pursue a career outside the laboratory
- Social scientists and business studies students who want to develop their interests in life science innovation
- Professionals already working in biotechnology related fields who wish to engage in further training and skills development.
- Most students (over 70%) from overseas. In 2015, most were from North America.
- Numbers have been around 10-12 for the past 3 years, but we are hoping to build to around 20.



Teaching Team

Course Leads

- Dr James Mittra (Programme Director)
- Prof Joyce Tait (Director of the Innogen Institute)
- Dr Ann Bruce (Senior Research Fellow; ESRC-NERC Agri-food Knowledge Exchange Fellow)
- Dr Geoff Banda (Research Fellow, Co-Director of Innogen - Health and Innovation)
- Dr. Michael Finnen (Teaching Fellow and former Head of Operations, Bioquarter, Edinburgh)

Selected Guest Speakers

- Prof Iain Gillespie (Director of Science at NERC and Former Head of Biotechnology at the OECD)
- Dr. Peter Kearns (Principal Administrator at OECD)
- Dr. Jack Scannell (Honorary Innogen Fellow and former drug industry analyst)



innogen

Thank You!



The Open University

