



ESRI @ 50 : Providing Evidence for Policy

THE ECONOMIC AND SOCIAL RESEARCH INSTITUTE

Waste projections

Seán Lyons

Seminar on Environmental
Projections and Policy for Ireland
18th February 2010

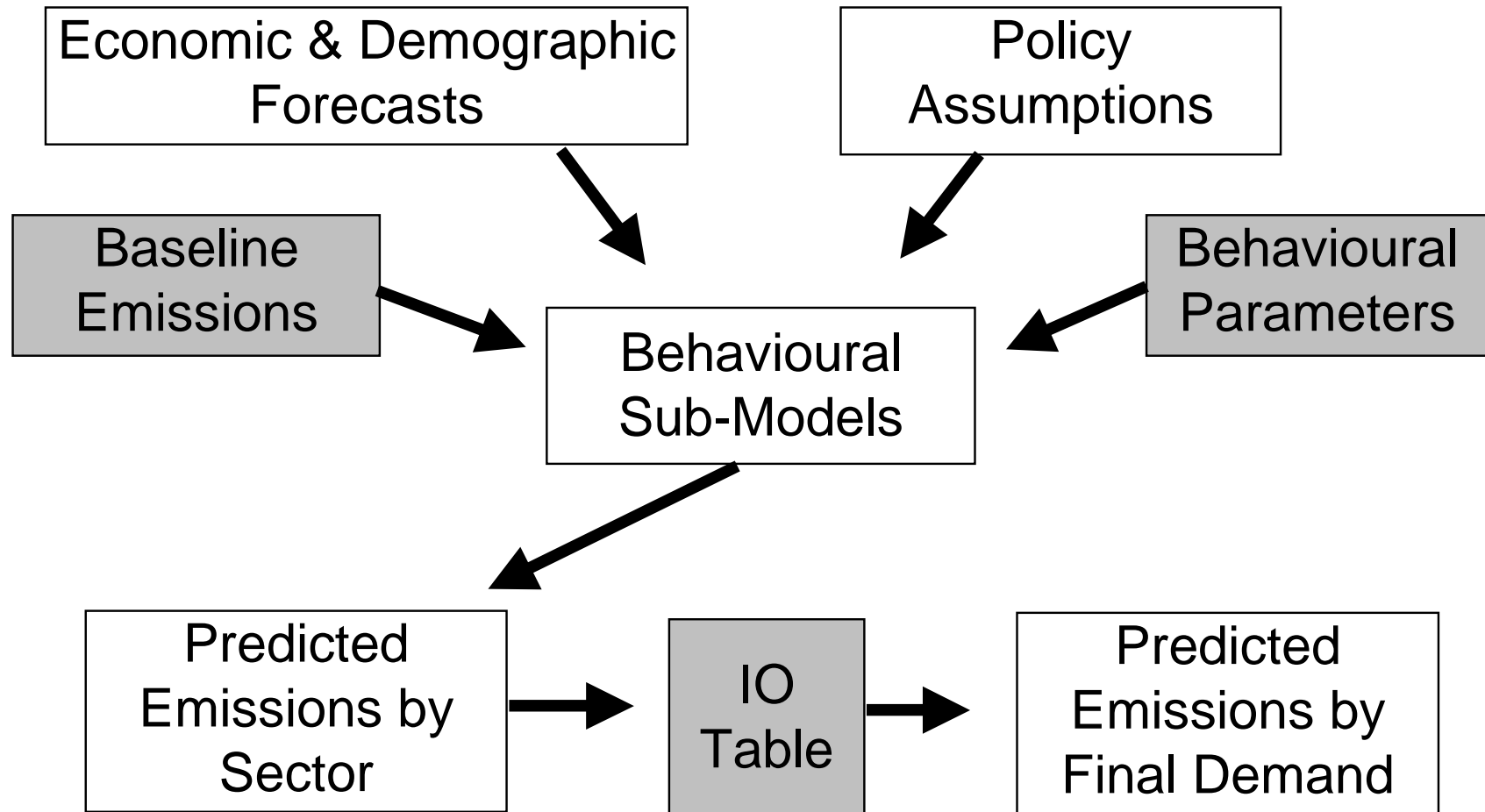
Outline

- Introduction
- The ISus model
- Planned extensions to environmental accounts
- Ongoing work on sub-models:
 - Industrial waste
 - Other waste categories
- Conclusions and future research

Introduction

- ESRI extending our ISus model, funded by the EPA's STRIVE programme.
- Solid waste emissions divided by type (Hazardous, Biodegradable Municipal Waste, Other) and disposition (Recycled, Incinerated, Landfilled, Unattributed)
- Both accounting and behavioural parameters to allow projections of alternative futures

The ISus Model



Sectors

Sector	NACE
Agriculture, fishing, forestry	1-5
Coal, peat, petroleum, metal ores, quarrying	10-14
Food, beverage, tobacco	15-16
Textiles Clothing Leather & Footwear	17-19
Wood & wood products	20
Pulp, paper & print production	21-22
Chemical production	24
Rubber & plastic production	25
Non-metallic mineral production	26
Metal prod. excl. machinery & transport equip.	27-28
Agriculture & industrial machinery	29
Office and data process machines	30
Electrical goods	31-33
Transport equipment	34-35
Other manufacturing	23,36-37
Fuel, power, water	40,41
Construction	45
Services (excl. transport)	50-55,64-95
Transport	60-63
Residential	

Current waste accounts structure

For each of the 19+1 sectors:

	BMW	Hazardous	Other
Landfill			
Incineration			
Recycling			
Unattributed			

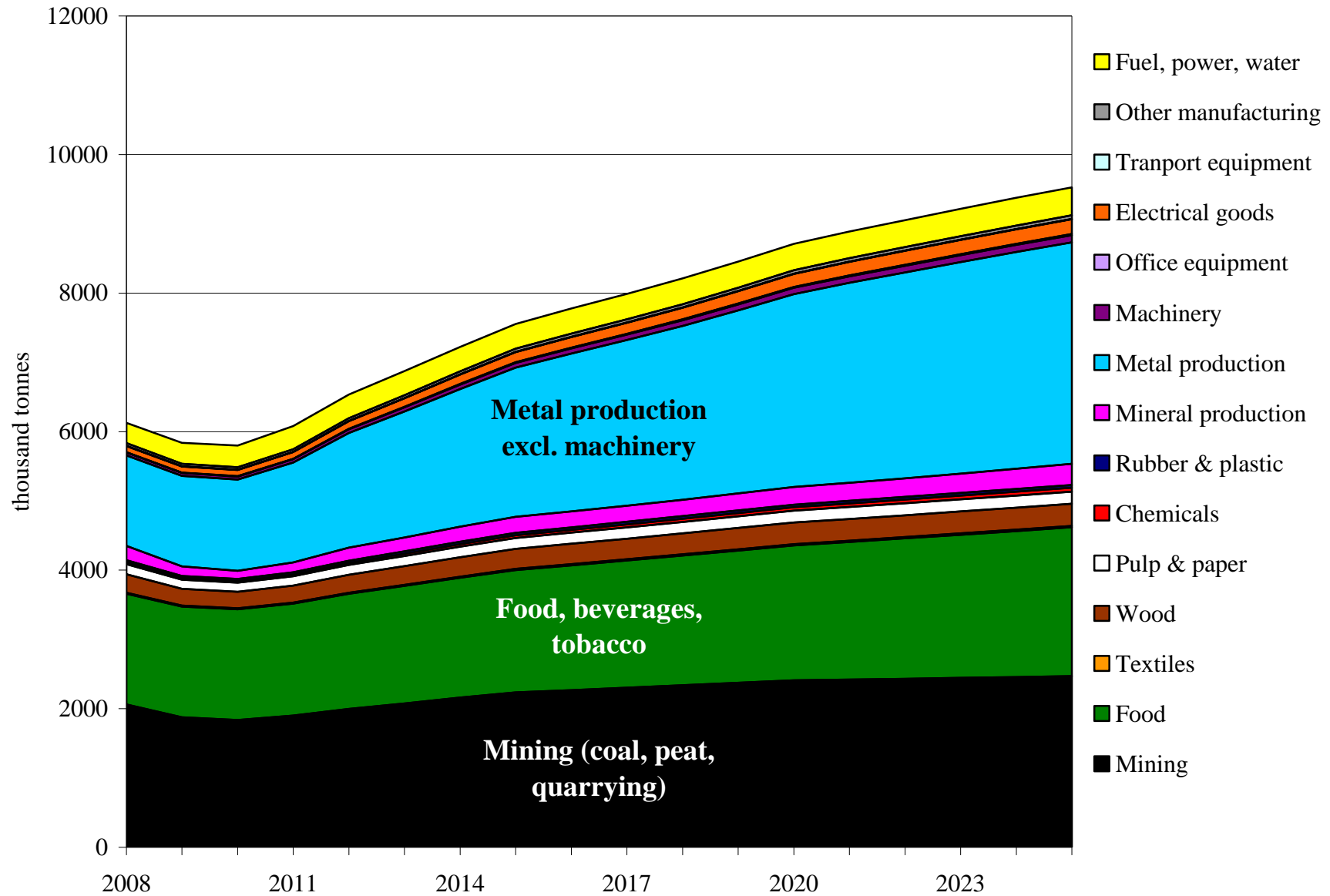
Planned additions to waste accounts

- Add new disposition dimension relating to reuse as fuel (e.g. in cement kilns)
- Add new emission categories for incinerator ash and refuse-derived fuel
- Separate out packaging waste?
- Scope to disaggregate hazardous waste, but to what level?

Industrial waste projections

- Industrial waste presently assumed to grow in line with sector output
- Major reclassification of mining sector waste between 2006 and 2008
- Scope for improvement
 - 2008 microdata recently became available
 - Different relationship to output for waste from different sectors?
 - What about different materials?
 - Responsiveness of waste disposition to price of landfill and alternatives (e.g. recycling)

Projections for non-hazardous industrial waste



Source: ISus model, based on *Recovery Scenarios for Ireland*; 2008 figures are actual

Industrial waste data

- Industrial waste is tracked in detail via IPPC licensing system and industry surveys
 - Microdata available for 2001/4/6/8 in electronic form
 - Firm-level microdata including waste quantity by material, sector, employees, county
 - Can be matched to IBEC data on landfill gate fees in local authority areas, but much material disposed of on-site, so landfill costs may not be a good proxy
 - Costs of alternatives to landfill difficult, but may be possible for some materials
 - Firm-level output data also problematic

Models of non-hazardous industrial waste

- Models
 - Dependent variables: 1) total arisings and waste sent for 2) disposal or 3) recycling
 - Explanatory variables: landfill charge, number of employees, county and time dummies
 - Separate models by sector
- Pooled time-series cross-section regressions
- Next steps
 - Add turnover/output data for 2008
 - Run separate models by material type
 - Link firms across time to form panel
 - Model hazardous waste

Some initial model results

Coverage	Dependent variable	Employment elasticity	Landfill price elasticity
All sectors	Total waste	1.0***	-0.68**
All sectors	Disposal	0.92***	-0.90***
All sectors	Recycling	0.80***	-0.046
Food, bevg	Disposal	0.61***	-1.4
Chemicals	Disposal	0.88***	-0.35
Metal prodn	Disposal	1.0***	-3.5***
Mining	Disposal	1.7***	3.9

- Employment elasticity significant and of plausible size
- Landfill price elasticity varies in scale and significance

Other changes to waste sub-models

- Agricultural organic waste growth now based on agricultural sub-model (Teagasc)
- Transport waste growth (waste oil and end-of-life vehicles) from car stock sub-model
- Adding further breakdown to construction & demolition waste model: e.g. split between new housing, repairs & maintenance, social infrastructure, etc.

Conclusions and further research

- Environmental accounts extensions
 - 'Reuse as fuel', ash and RDF categories
 - Perhaps not packaging in the short run
 - Some disaggregation of hazardous waste?
 - Other suggestions?
- Industrial waste models
 - Initial results after adding '08 data encouraging
 - Additional work to include firm identifier to allow panel estimation, turnover, materials split, prices of recyclables