



# WISE FP/WRTM Economic Projections

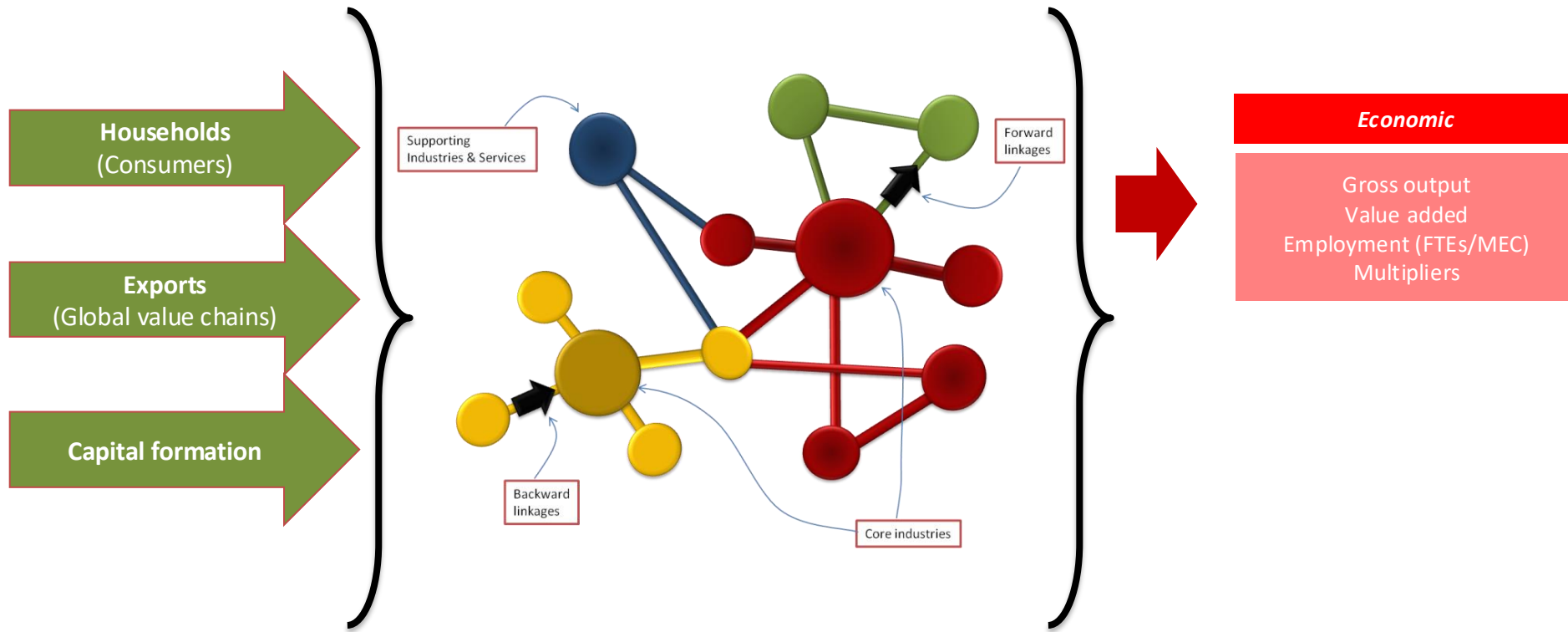
Dr Garry McDonald

**m.e** environment

# EFM Uses

- Councils using the EFM include Waikato RC, Auckland Council, Greater Wellington, Wellington CC and Christchurch CC
- Auckland Council Economic Forum/MBIE Growth Goals (2009-2010) Auckland EDS (2011), Wellington City EDS (2011), Waikato EDS – Mayoral Forum (2013)
- ‘Alliance Consortium’ – SkillsNZ, Unitec, MIT, BCITO, Infratrain, Fletchers, Hawkins, Naylor-Love, Dominion Construction, Auckland Council, NZTA (Chris Gasson)
- Canterbury quake: CDC, CERA, DoL, MBIE, and insurers’ PMOs (SCIRT, Fletcher EQR, Hawkins)
- EIAs – Ports of Auckland, Auckland International Airport, events (official 1999 and 2003 America’s Cup, 2011 Rugby World Cup)

# Economic model



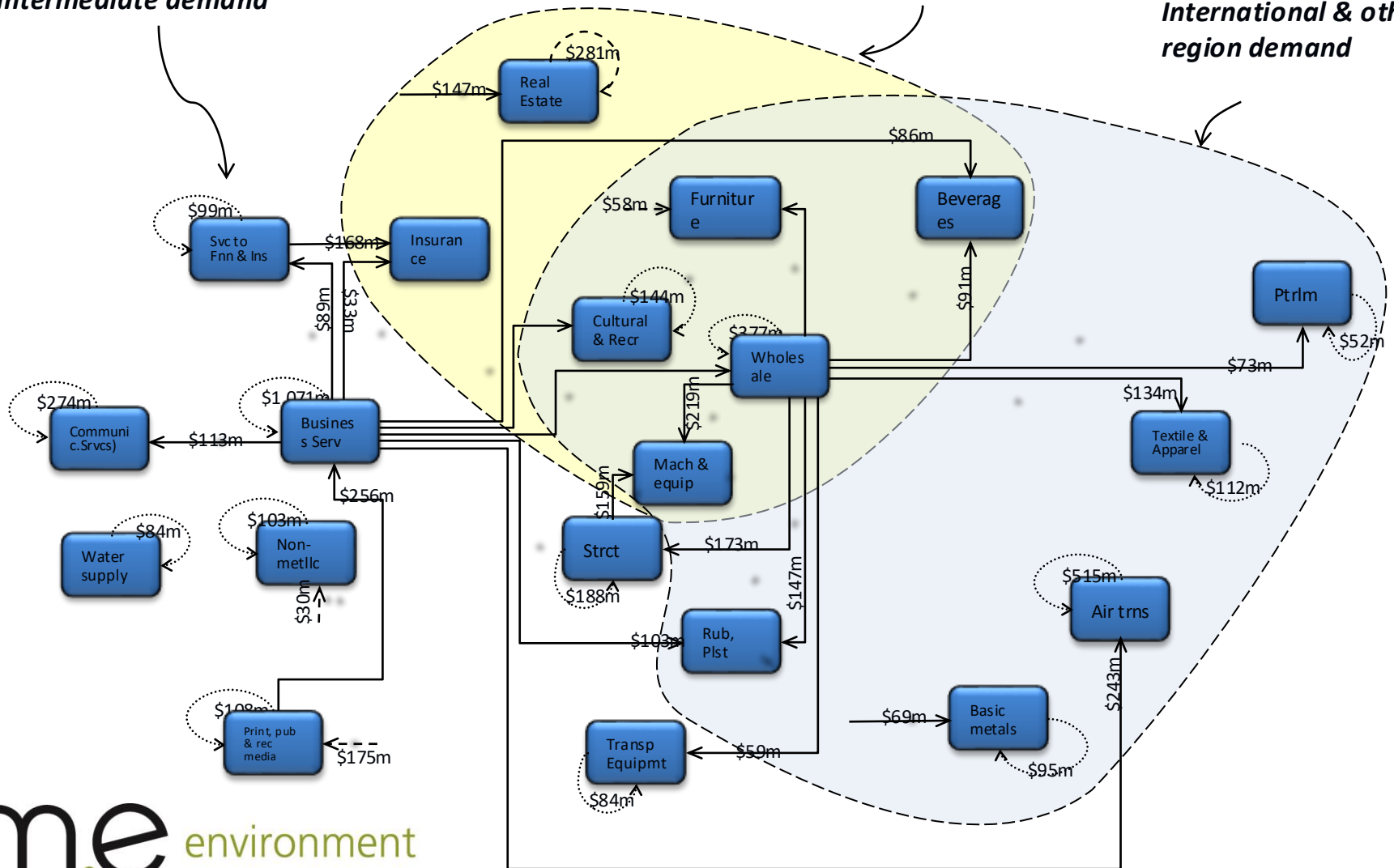
**Multi-Regional Input-Output (MRIO) Table**

# Economic Interdependencies

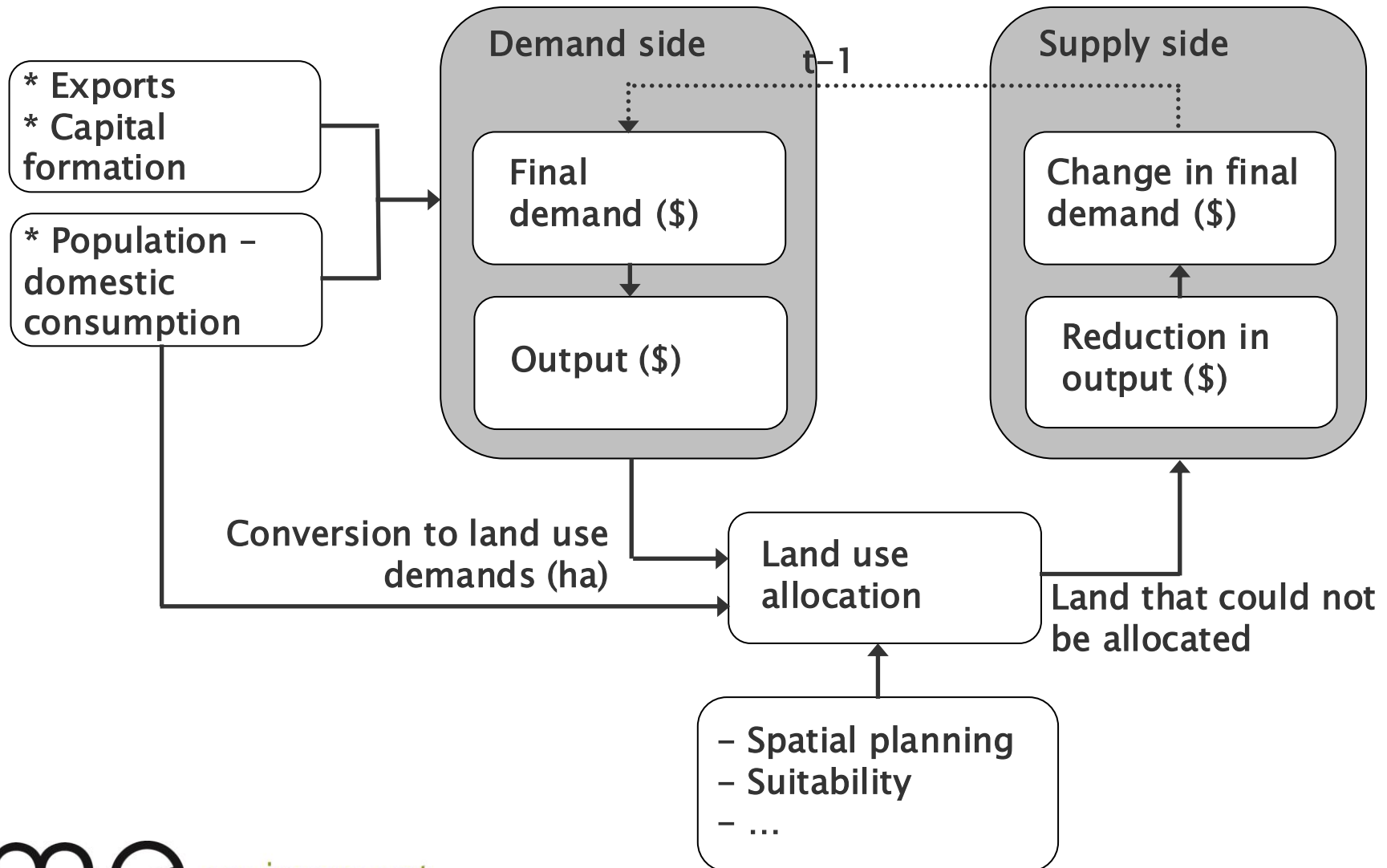
*Industries driven by intermediate demand*

*Industries driven by local demand*

*Industries driven by International & other region demand*



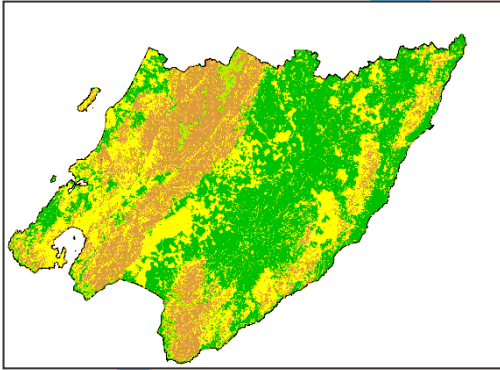
# How does the WISE/EFM economic model work?



# How does ISE work?

Land use  
at time T+1

Suitability

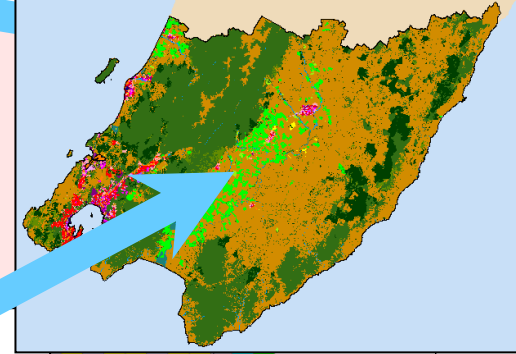


&

$$v = 1 + (-\ln[\text{rand}])^\alpha$$

0 0.5 1

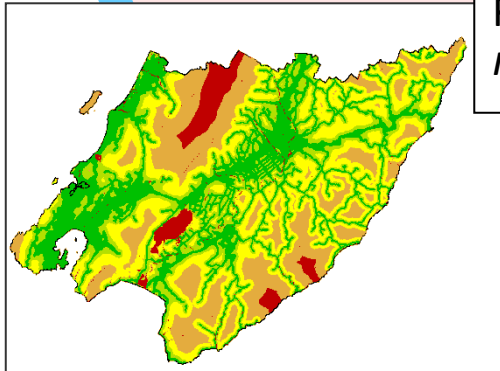
Stochastic perturbation



## Transition Rule

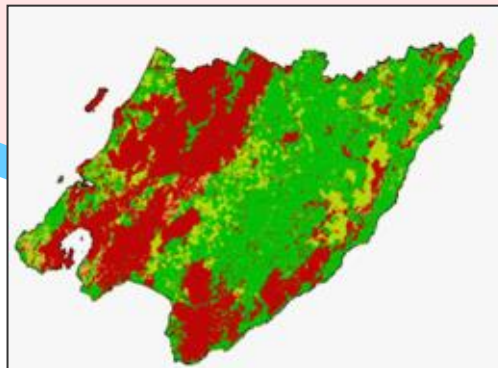
Change cells to the land use for which they have the highest transition potential *until regional demands are met*

Accessibility



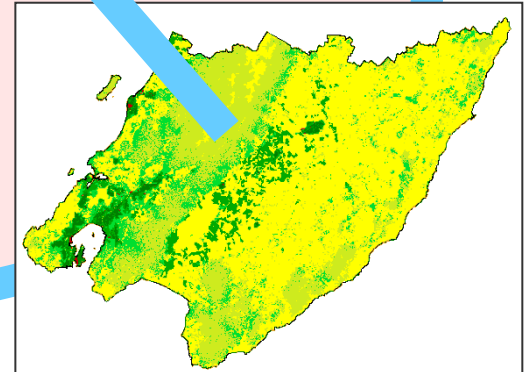
&

Zoning



=

Transition  
Potentials



# FP/WRTM Projections

- **Establish Inputs** for WISE/EFM models
  - (1) NIDEA population projections, (2) International trade growth rates (EFM BAU, Treasury & third party forecasts), (3) Capital formation (EFM BAU & workshop process)
- **Run WISE** to account for land use change constraints (suitability, accessibility, zoning, existing spatial relationships)
- **Run Spatial EFM** to account for cross-boundary growth – Auckland, Bay of Plenty & rest of New Zealand
- **Distribute to TAs** based on spatial EFM growth projections
- **Distribute to CAUs** based on WISE land use projections (4ha), existing employment structures (SNZ BD) & emergent investments (FP workshops) (*AGM Smarts – Residential/Business*)
- **Output** Employment projections by RC, TA, 4ha WISE & CAU area by 1 & 5 yearly increments (2013-2061)

# EFM Peer Review

- The EFM model and its labour force/skills projections for the Canterbury quakes rebuild extensively peer reviewed
- Reviewed by DoL (2010) (Dirk van Seventer, Infometrics), CERA (2011-2012), MBIE (2013) (Dave Patterson/Dafydd Davies), and PMOs (SCIRT, Fletcher EQR) and insurers (EQC, AMI, Tower etc) quarterly review; independent technical review TDB Advisory Ltd (Philip Barry)
- Alliance Consortium – Six monthly review, formal review
- Dynamic EFM – GNS ‘Economics of Resilient Infrastructure’, quarter review by Treasury (NIU, Anita King), NZTA (Ernie Albuquerque), also international review (Adam Rose, Manfred Lenzen)