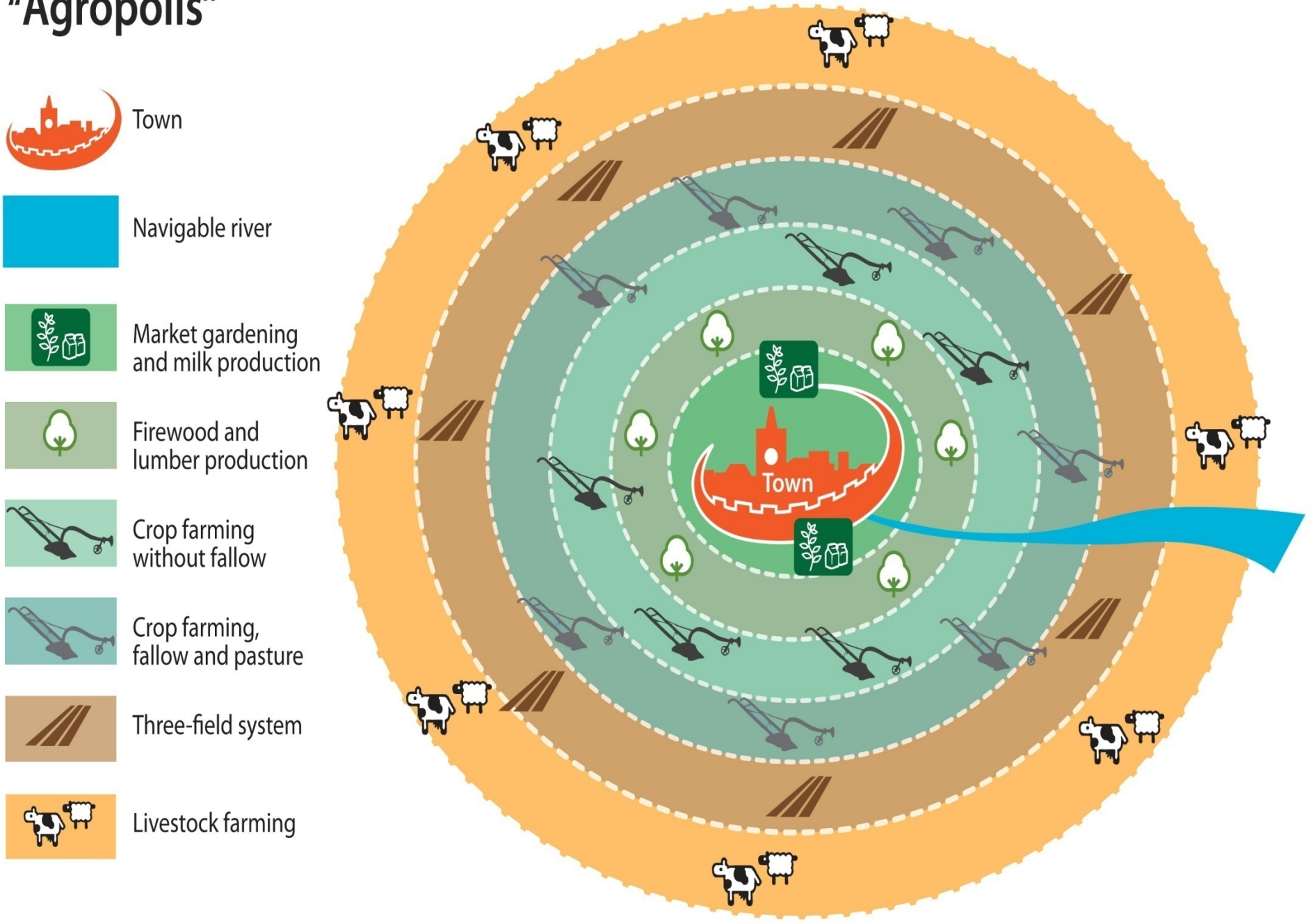
Sustainable or regenerative?

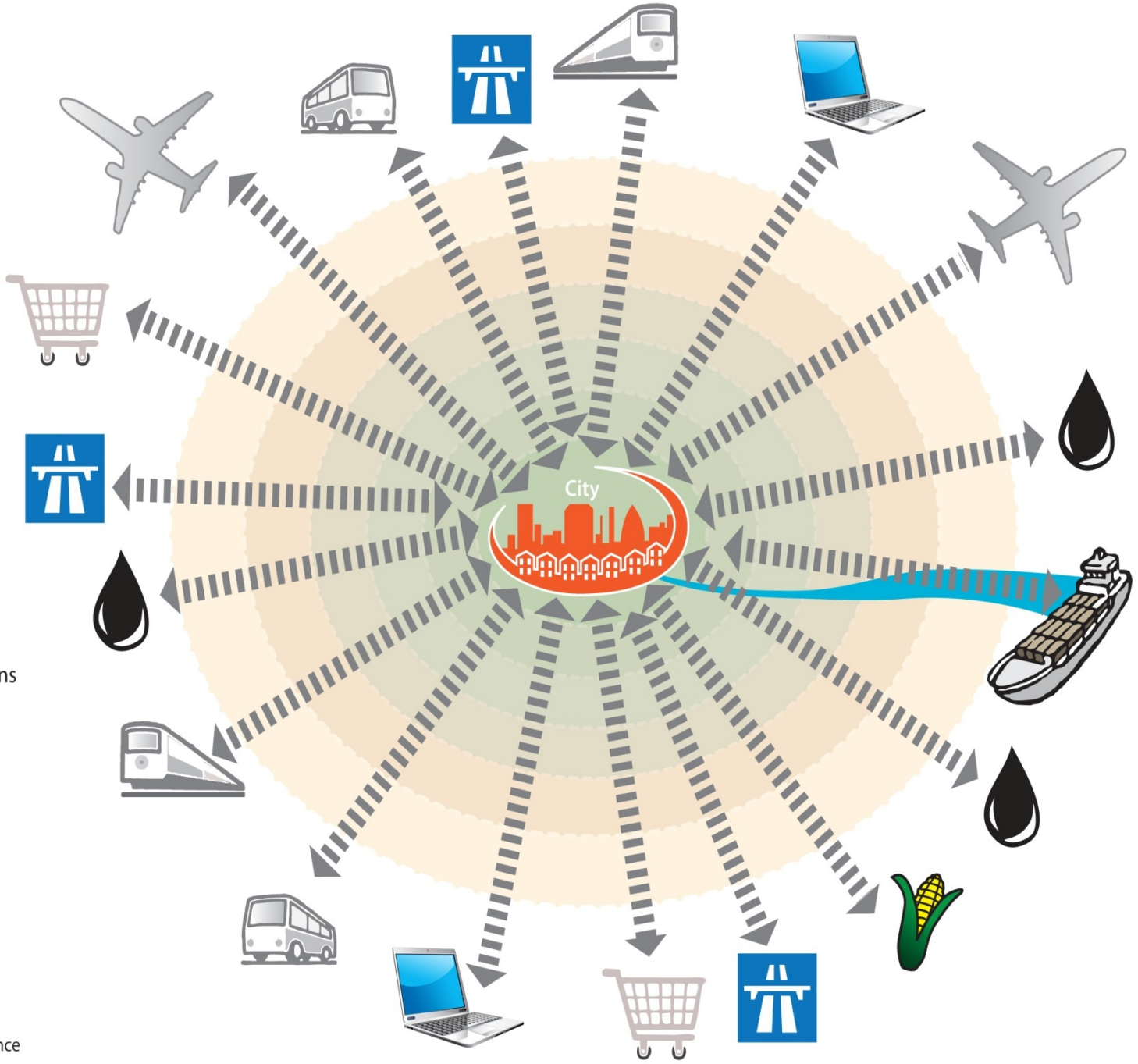
Herbert Girardet

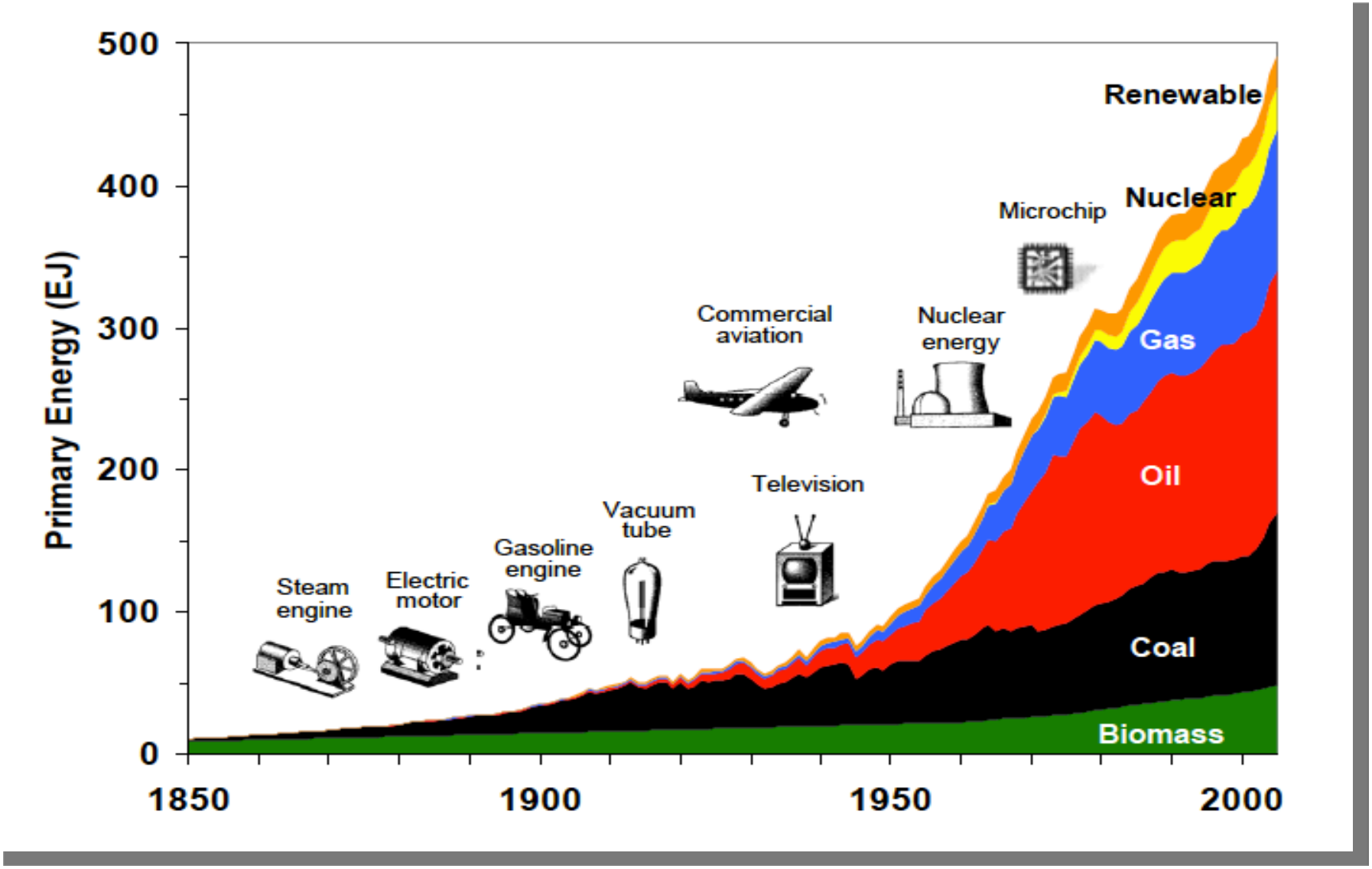
"Agropolis"



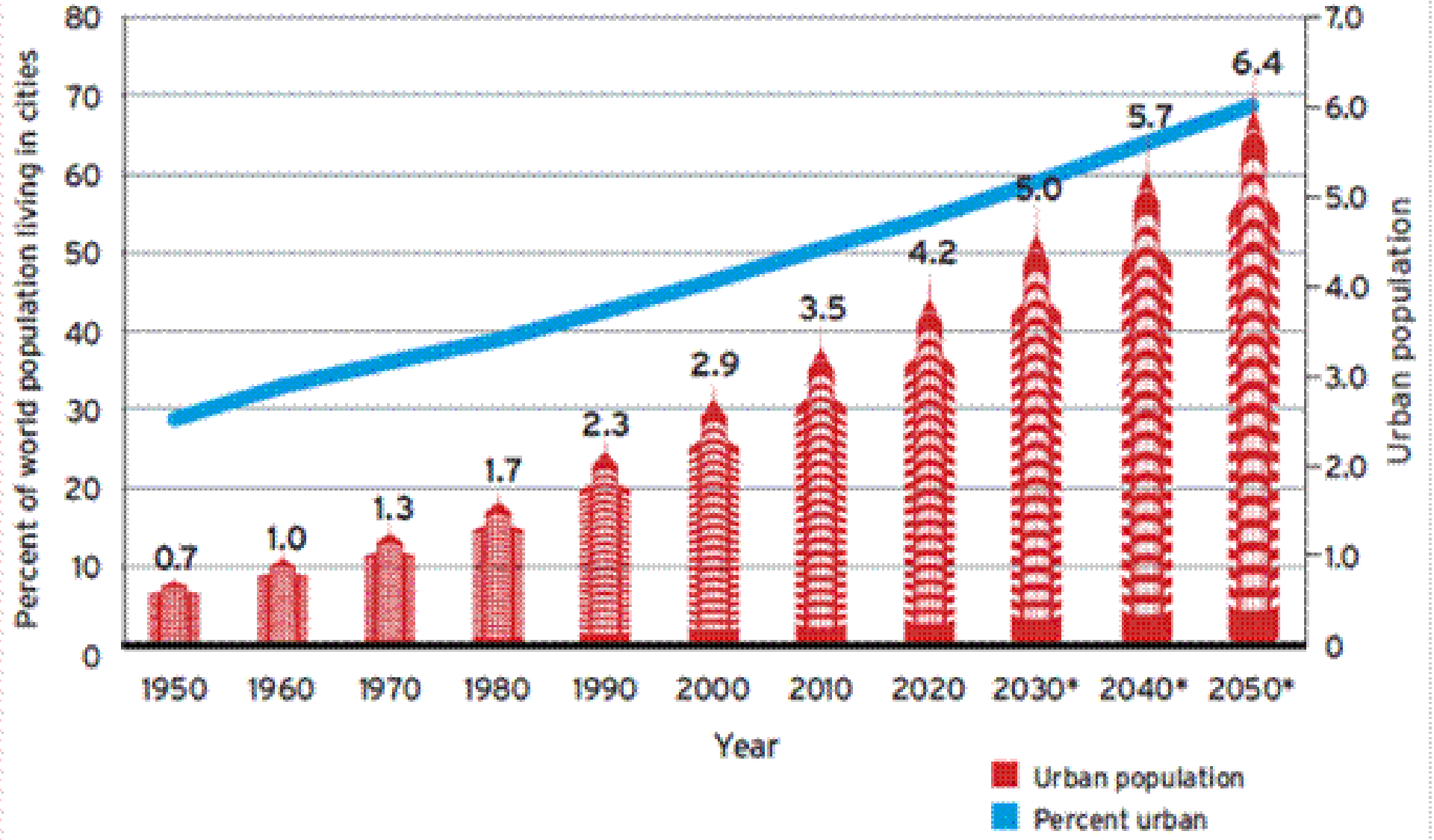

AQVISGRANVM
SEPTENTRIO

"Petropolis"





Source: Nakicenovic 2009


Percent of world population living in cities
80
70
60
50
40
30
20
10
0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0
Urban population
0.7
1.0
1.3
1.7
2.3
2.9
3.5
4.2
5.0
5.7
6.4
1950
1960
1970
1980
1990
2000
2010
2020
2030*
2040*
2050*
Year
Urban population
Percent urban

The age of the city

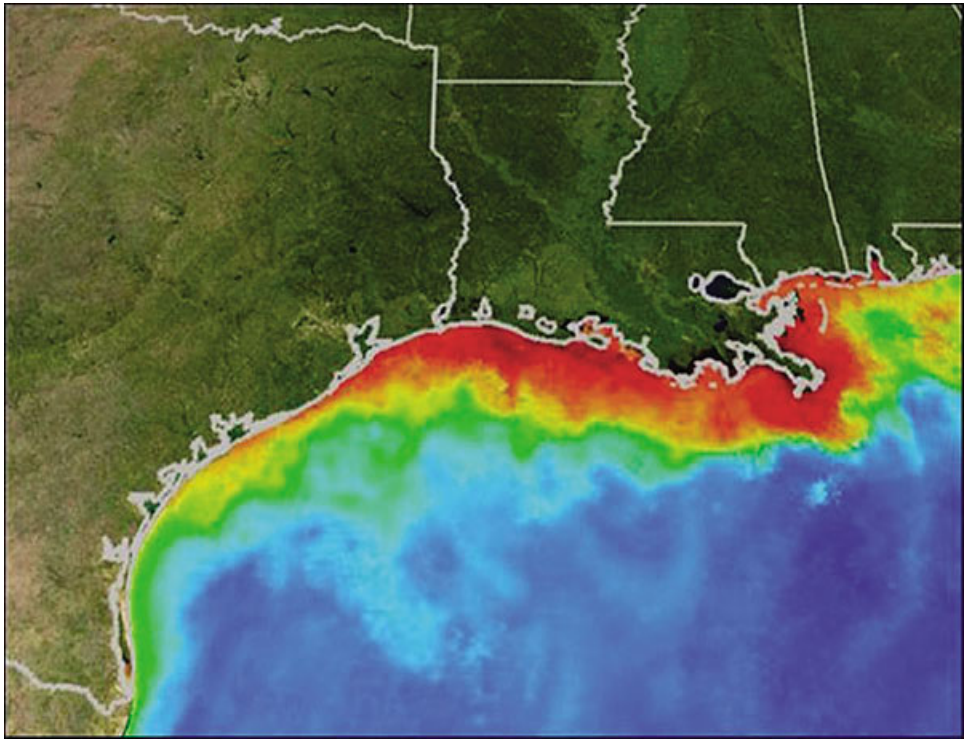
- Cities define human existence in the 21st century
- They are the heartland of national economies, financial systems and cultural life
- But a ‘pre-galilean’ mindset prevails: cities see themselves as ‘centres of the universe’
- Modern cities have the tendency to declare ‘independence from nature’
- But: they are subject to entropy – they can’t escape the second law of thermodynamics

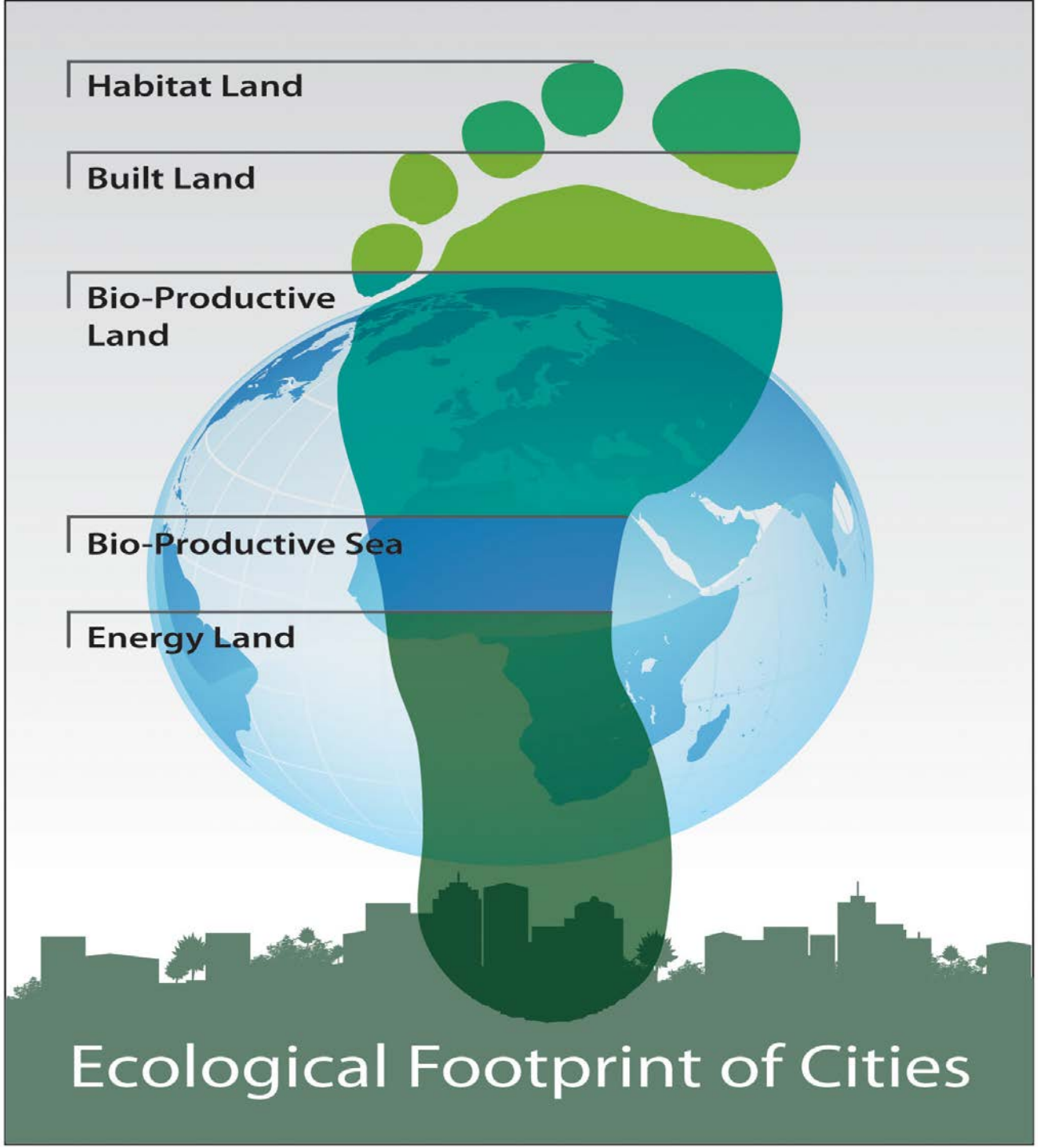
Atlanta

Each European has about 60 energy slaves, each American about 110 energy slaves. That is the energy equivalent of a strong man working 10 hours a day six days a week represented by the energy output of the motors and engines, powered by fossil fuel energy, working on our behalf. In a sustainable world this figure would have to come down to a quarter or less.

Shanghai Pudong 1978

Shanghai Pudong 2013



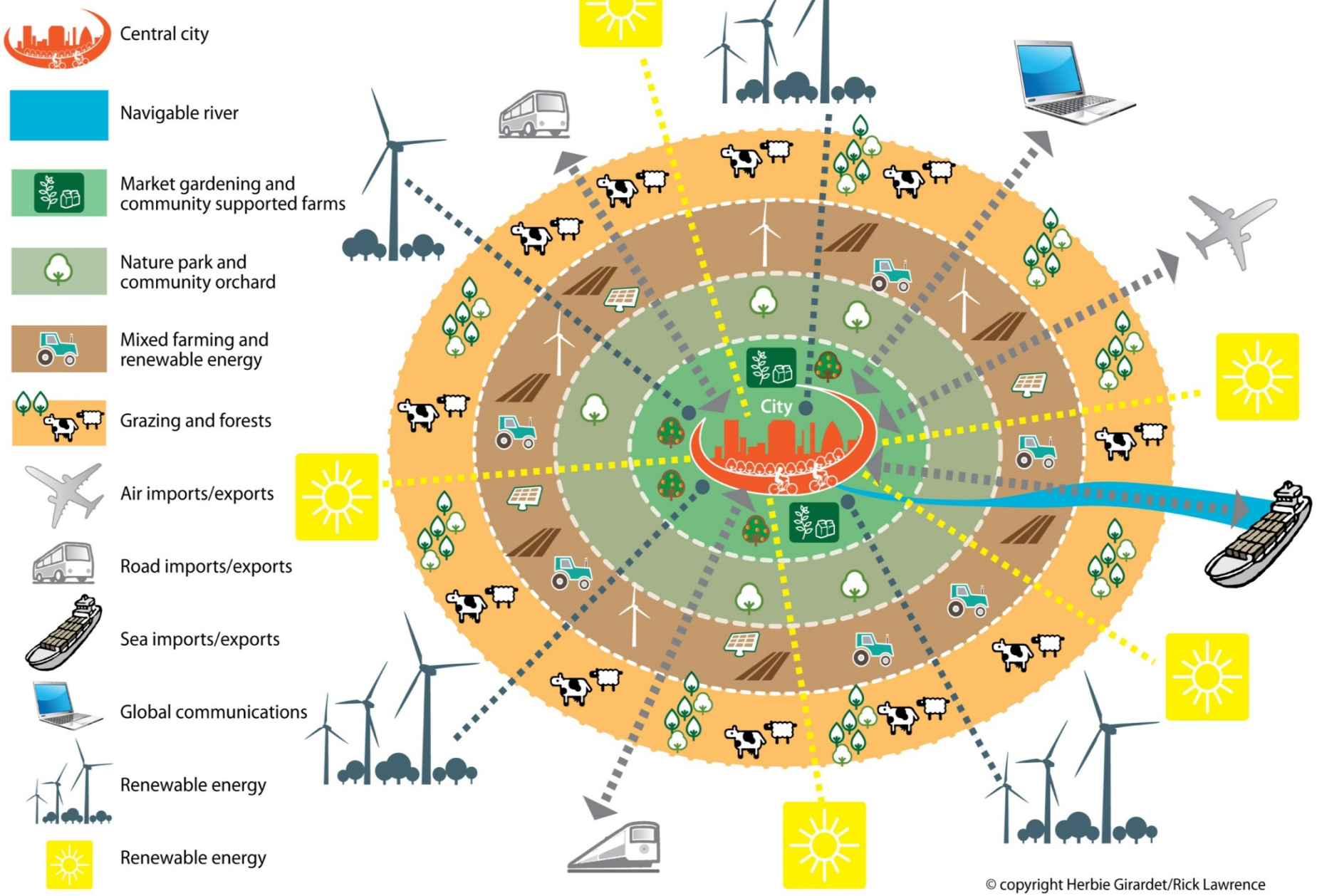

Habitat Land
Built Land
Bio-Productive Land
Bio-Productive Sea
Energy Land
Ecological Footprint of Cities


scrap metal
metel sgrap
VIRIDOR
01495 755 890

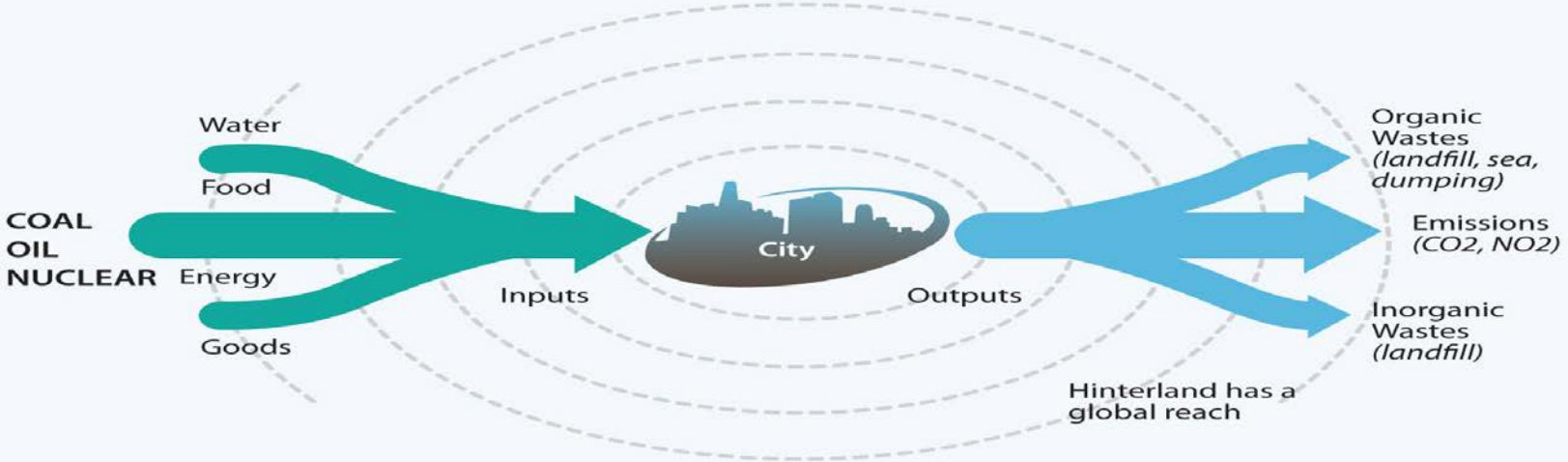
Structures and processes

- City planners are primarily concerned with urban *morphology* as a way of addressing urban impacts
- But arguably the *metabolic processes* that define cities are more important in understanding urban impacts
- The metabolism of cities is not confined to the intra-urban realm:
- It reaches across the planet – biosphere, aqua-sphere, lithosphere, atmosphere

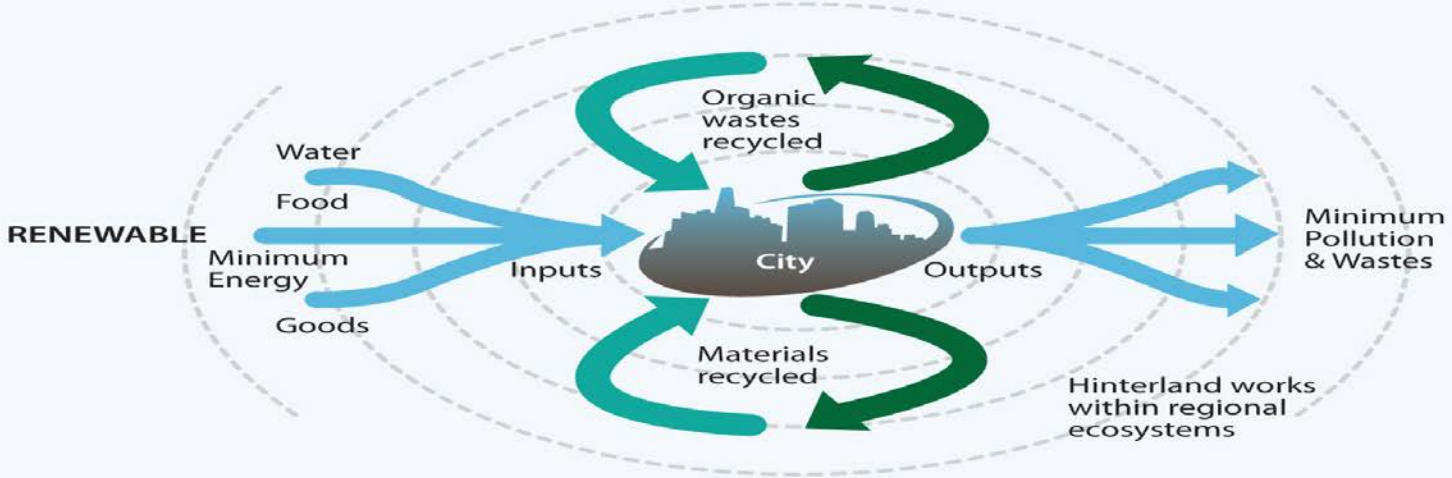
"Ecopolis"



LINEAR METABOLISM CITIES CONSUME RESOURCES AND CREATE WASTE AND POLLUTION AT A HIGH RATE



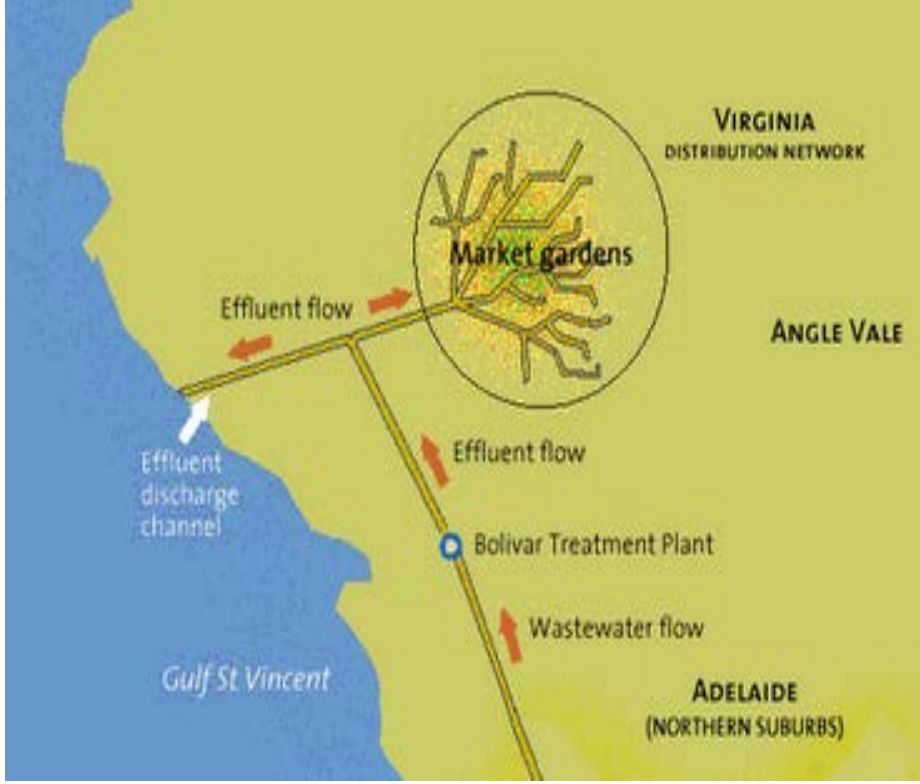
CIRCULAR METABOLISM CITIES REDUCE CONSUMPTION AND POLLUTION, RECYCLE AND MAXIMIZE RENEWABLES



Credit: Herbert Girardet.

Adelaide

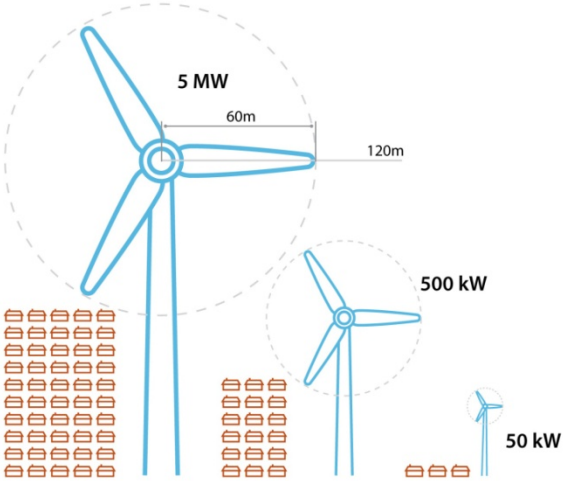

Tindo
Tindo


VIRGINIA
DISTRIBUTION NETWORK
Market gardens
Effluent flow
ANGLE VALE
Effluent flow
Effluent discharge channel
Bolivar Treatment Plant
Wastewater flow
Gulf St Vincent
ADELAIDE
(NORTHERN SUBURBS)


QUALITY FRUIT
eftpos available here
eftpos available here
GOLD
PINEAPPLE

‘Regenerative’ Adelaide 2013

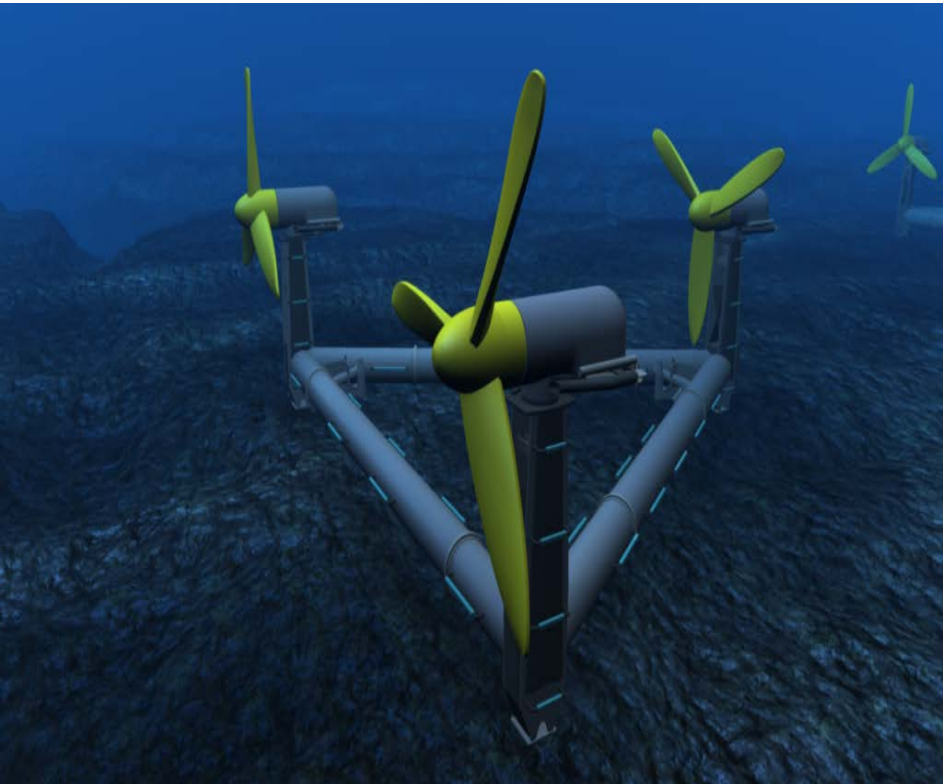
- **40% electricity supply from wind and solar**
- **120,000 PV roofs on 600,000 houses = 250 MW peak**
- **PV roofs on most public buildings**
- **Solar hot water systems mandated for new buildings**
- **3 million trees planted on 2000 ha for C02 absorption and biodiversity**
- **15% reduction of C02 emissions since 2000**
- **Water sensitive urban development**
- **180,000 tonnes of compost made from urban organic waste**
- **20,000 ha of peri-urban land used for vegetable and fruit crops**
- **Reclaimed waste water and urban compost used to cultivate this land**
- **Large scale-building tune-up programmes across the city region**
- **60% carbon emissions reduction by municipal buildings**
- **Construction of Lochiel Park Solar Village with 106 eco-homes**
- **Thousands of new green jobs**



With good wind, this turbine could generate enough electricity for 1250 homes.

With good wind, this turbine could generate enough electricity for 50 homes.

With good wind, this turbine could generate enough electricity for 12 homes.




COM A RECICLAGEM CURITIBA SALVOU
4072180
ÁRVORES
SE TODAS AS CIDADES DO BRASIL
SEGUISSEM ESTE EXEMPLO:
81493686
LIXO QUE NÃO É LIXO
50 Kg DE PAPEL
= 1 ÁRVORE
CURITIBA
PREFEITURA MUNICIPAL


BLO

Creating Regenerative Cities

Herbert Girardet

ROUTLEDGE