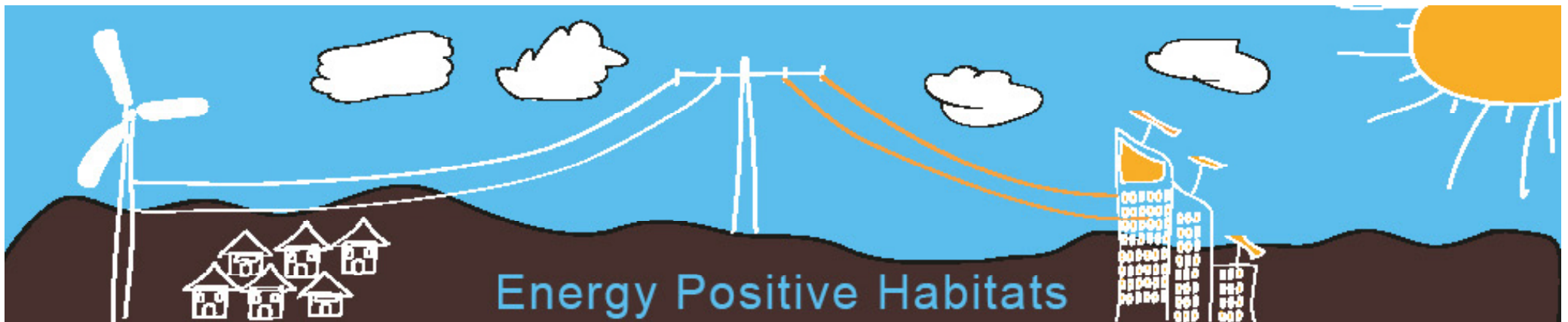


Auroville Green Practices

A Hands-on-Workshop
30 Aug to 1 Sept, 2012
Auroville (near Pondicherry)



‘Human Habitats today have become centers of energy consumption. By conserving energy with appropriate building design, reducing energy by efficient energy management and producing energy with decentralized systems that allows feeding surplus energy into the grid, we can create a shift towards energy positive habitats. Essential to this movement is the fact that humans have to change their life styles to consume less energy.’

**Energy, Habitats and Lifestyles:
The Quest for *Regenerative Cities***

Herbert Girardet

Presentation Outline

1. From “Agropolis“ to “Petropolis“

2. The city as eco-predator

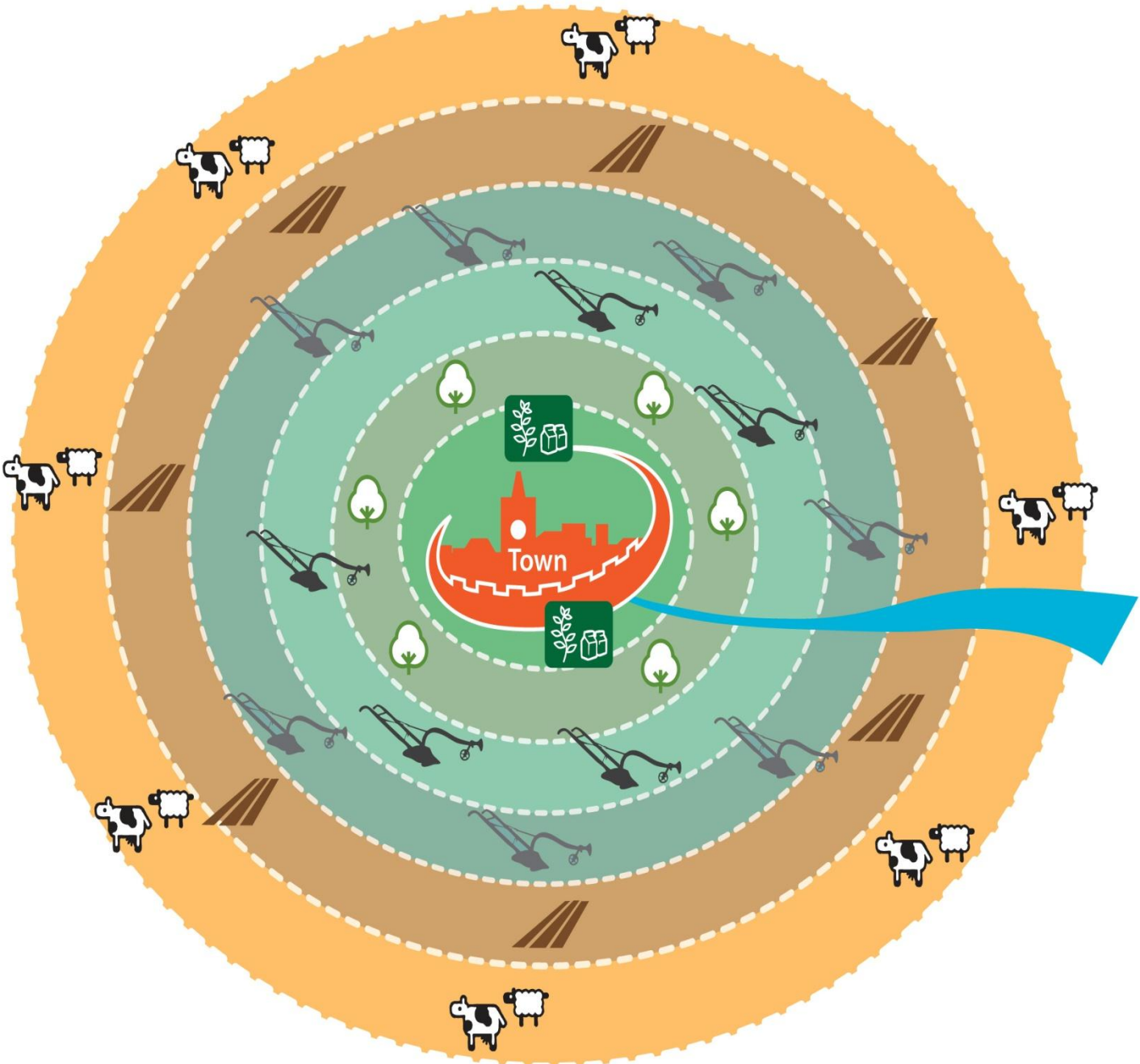
- Fossil fuels and urban growth
- Cities and the climate crisis

3. *Sustainable or regenerative* urbanisation?

- Towards “Ecopolis“
- The renewable energy revolution
- Towards a circular metabolism
- Integrated urban planning
- Creating the regenerative city

"Agropolis"

-  Town
-  Navigable river
-  Market gardening and milk production
-  Firewood and lumber production
-  Crop farming without fallow
-  Crop farming, fallow and pasture
-  Three-field system
-  Livestock farming



Montereggioni, Tuscany





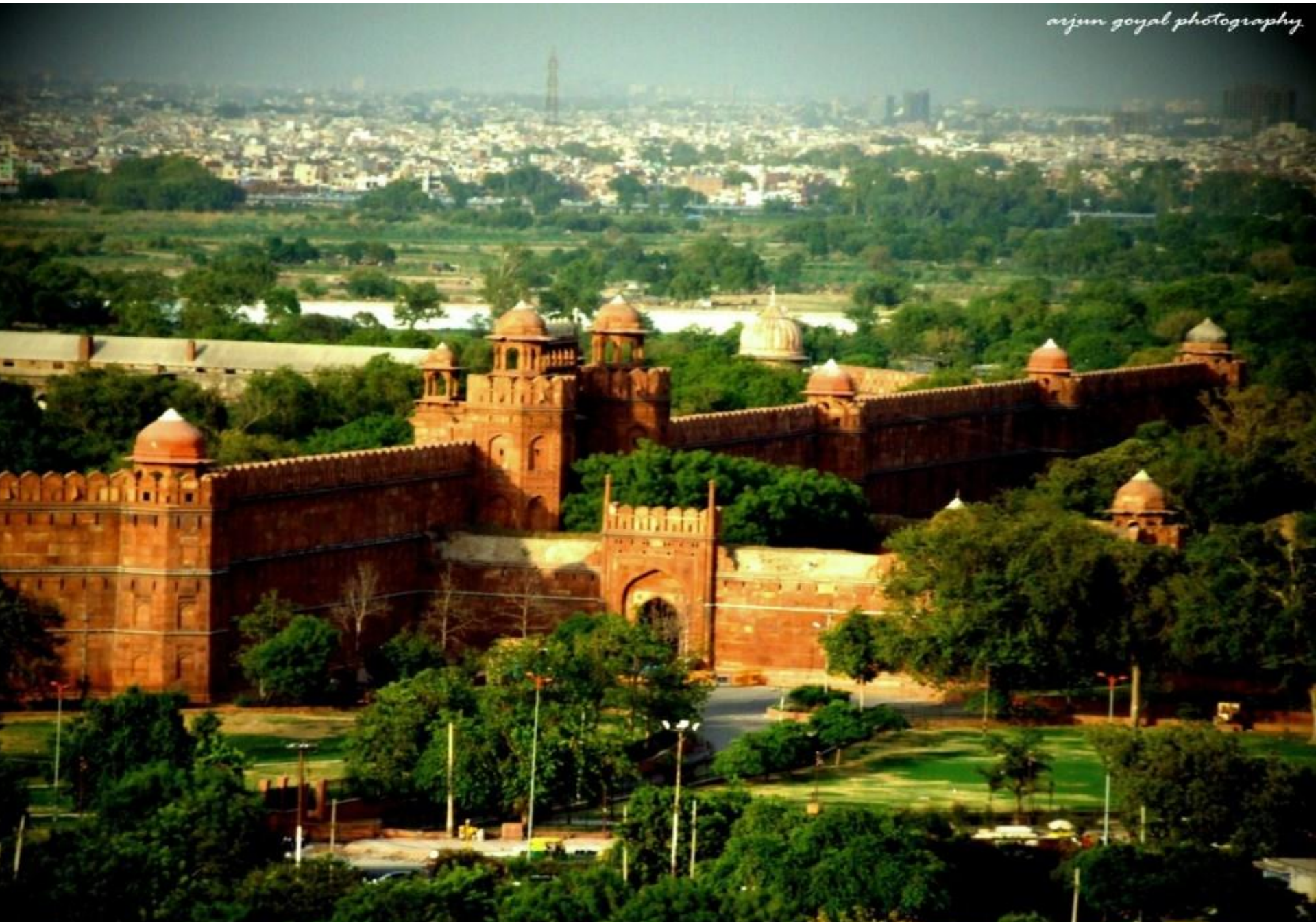
SEVIL LA



- | | | | | | | | | | |
|------------------------------------|----------------------------|----------------------------|---------------------------|----------------------------|----------------|----------------------|-----------------------|------------------------|------------------------|
| 1. Arco de San Pedro de Carmona | 2. Calle de Sierpes | 3. Calle de Capuchinos | 4. Calle de San Francisco | 5. Plaza de San Pedro | 6. La Alcazar | 7. Puente de Triana | 8. Puente de Alameda | 9. Puente de San Juan | 10. Torre del Trovador |
| 11. Arco de San Pedro de Alcantara | 12. Calle de San Francisco | 13. Calle de San Juan | 14. Calle de San Pedro | 15. Plaza de San Francisco | 16. La Alcazar | 17. Puente de Triana | 18. Puente de Alameda | 19. Puente de San Juan | 20. Torre del Trovador |
| 21. Calle de San Juan | 22. Calle de San Pedro | 23. Calle de San Francisco | 24. Calle de San Juan | 25. Plaza de San Francisco | 26. La Alcazar | 27. Puente de Triana | 28. Puente de Alameda | 29. Puente de San Juan | 30. Torre del Trovador |

Delhi

arjun goyal photography









"Petropolis"



Central city



Navigable river



Air imports/exports



Road imports/exports



Rail imports/exports



Sea imports/exports



Global communications



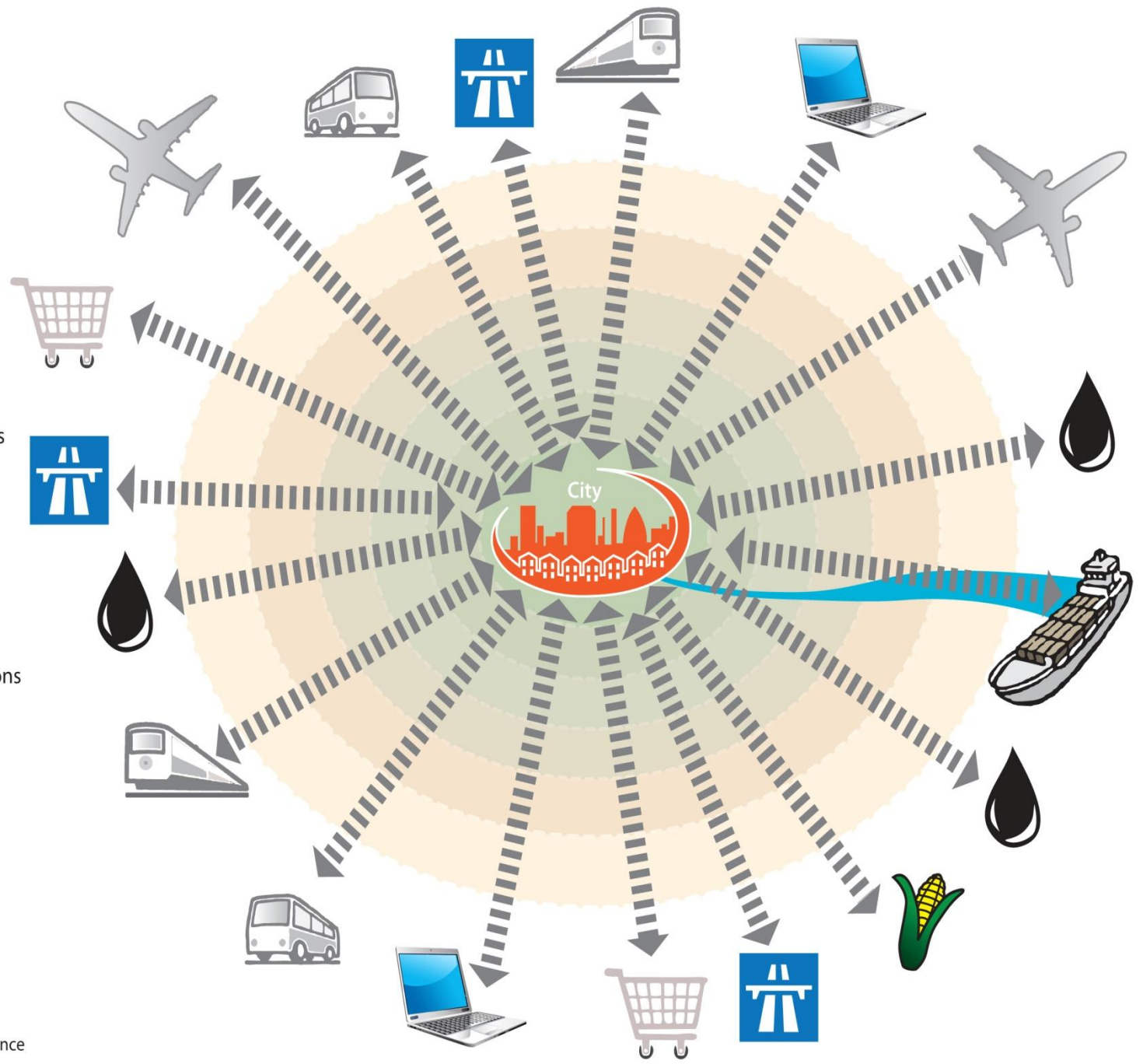
Oil imports



Food imports



Motorway links











London





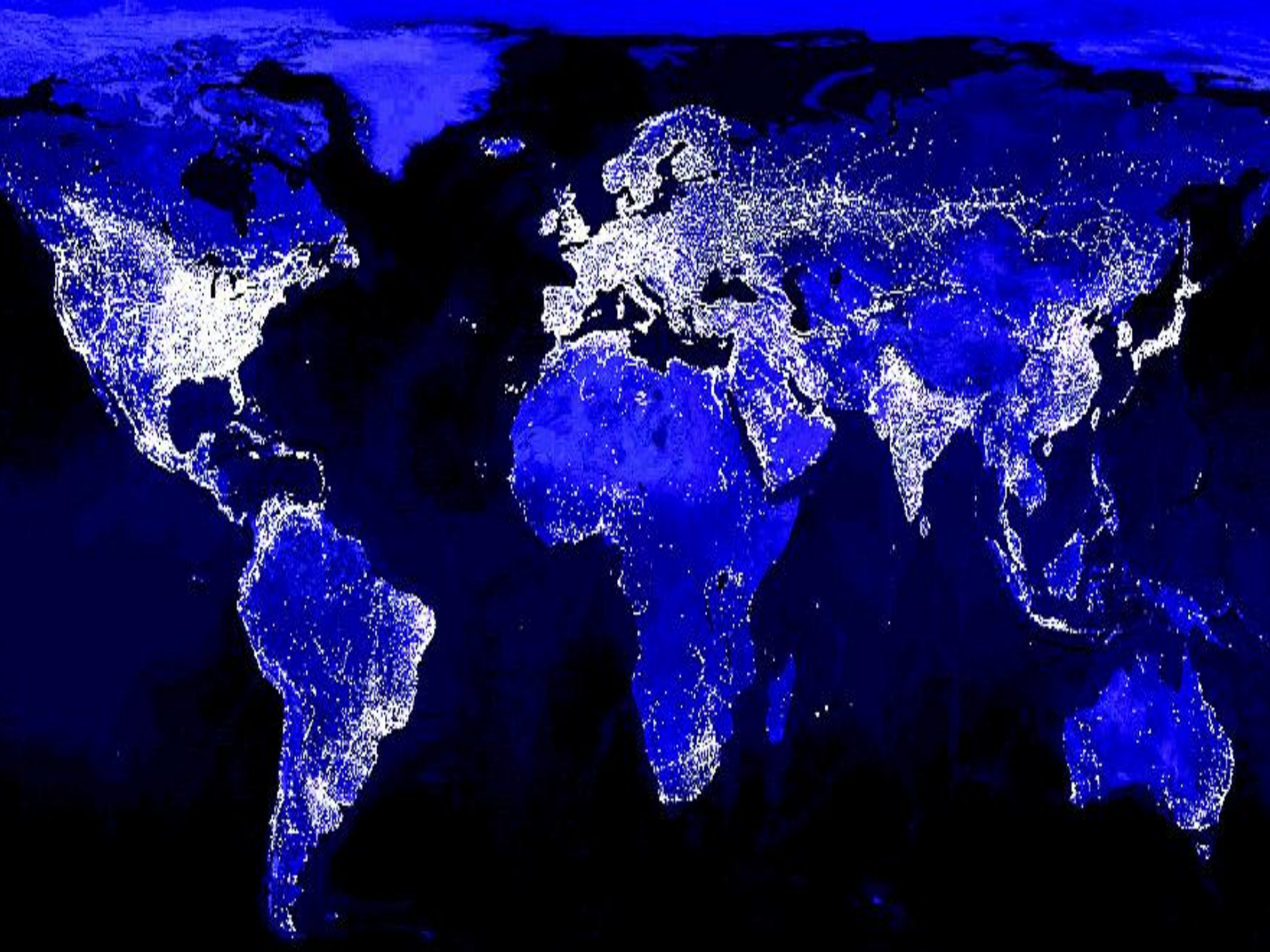


The Great Acceleration

1950 marked the beginning of a massive acceleration in human activity and large-scale changes in the Earth system.



SOURCE: igbp.net | Steffen et al., 2005, Global Change and the Earth System, Springer, pp. 132-133
DESIGN: Globaia.org



Urban growth & resource use

- From 1900 to 2000 human numbers increased four fold – from 1.5 to 6 billion
- Resource consumption and urban populations went up sixteen fold
- By 2050 two thirds of humanity are expected to be urban dwellers
- Already cities, on 3-4% of the world's land surface, use 80% of its resources, and discharge most wastes
- What will further urbanisation mean for the condition of the biosphere?
- Can large, modern cities be a viable, resilient home for humanity?















Ecological footprint

Atlanta



Dubai









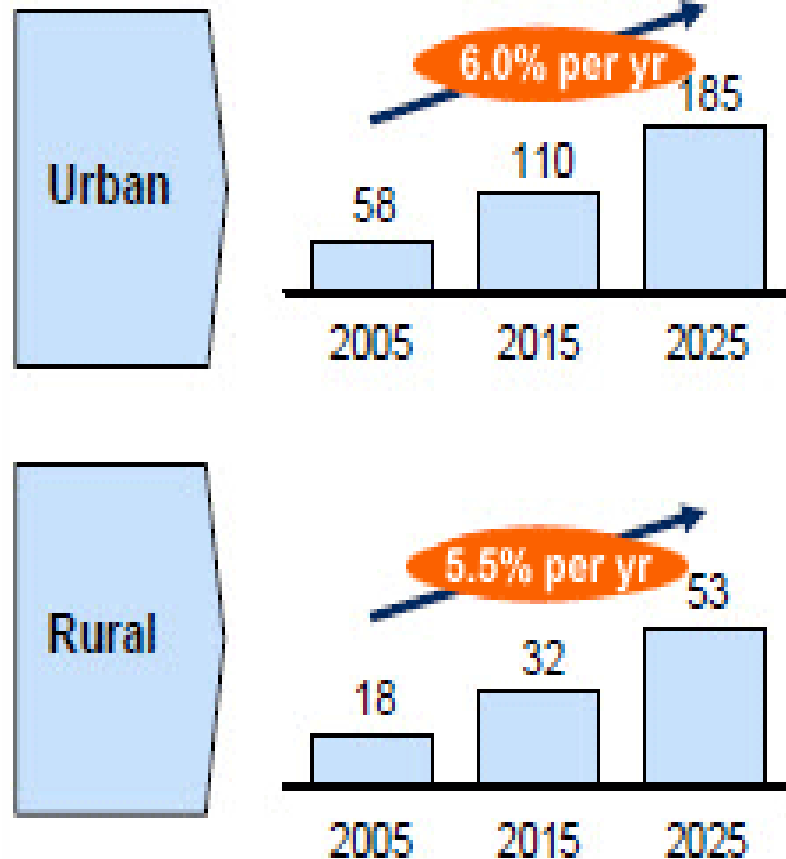


Darawi, Mumbai

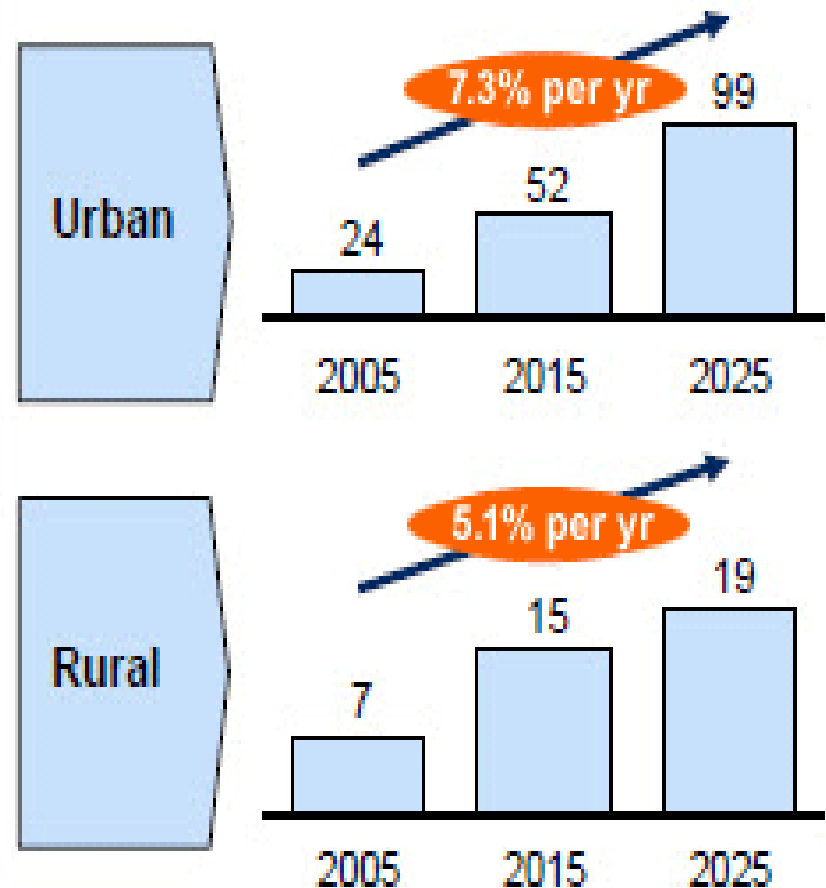


Urban GDP Growth to Outpace Rural

India real GDP per capita
Thousand rupees, 2005



China real GDP per capita
Thousand renminbi, 2005



Source: India Urbanization Model; McKinsey Global Institute China All City Model, January 2010; McKinsey Global Institute analysis



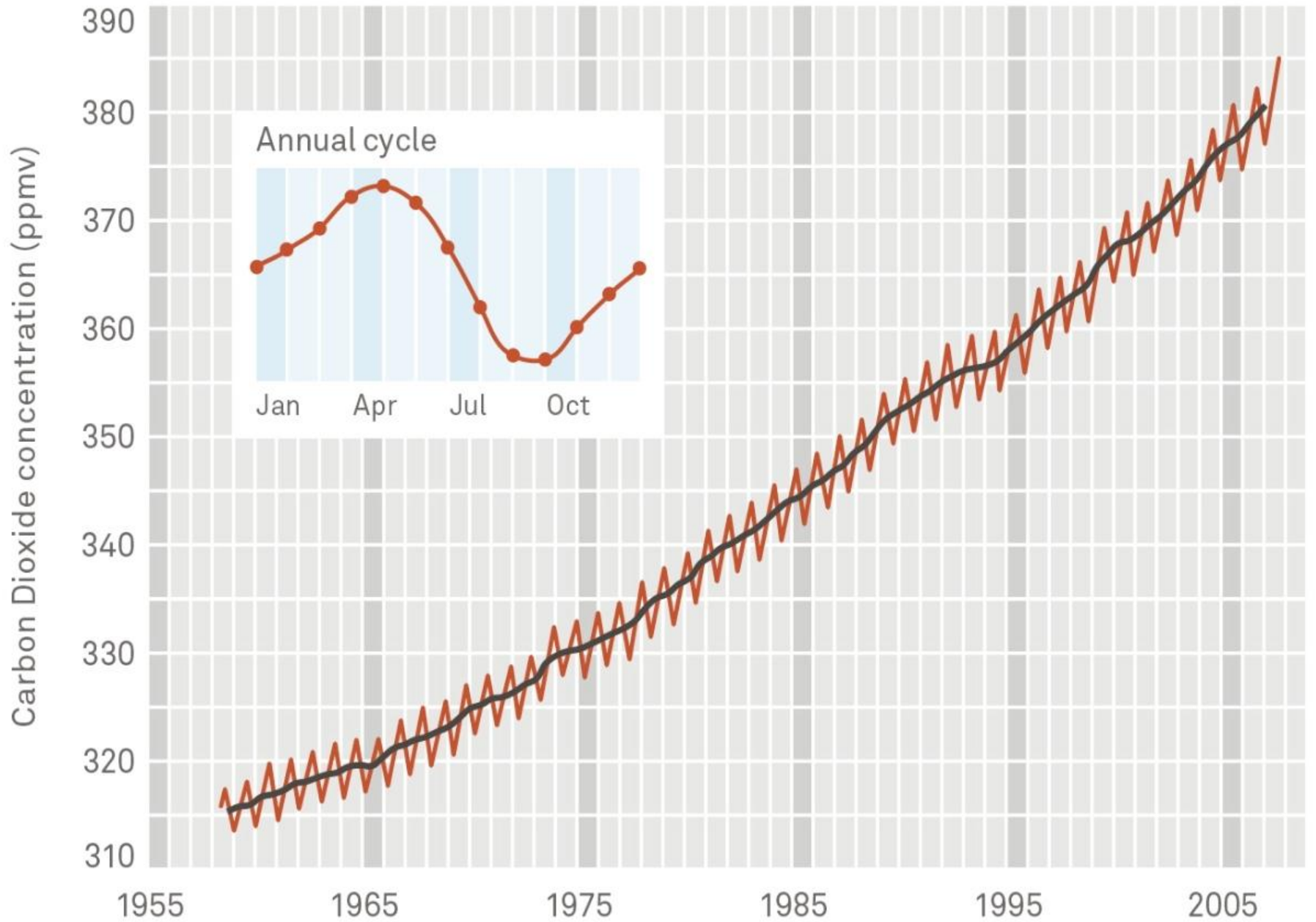






Atmospheric Carbon Dioxide

Measured at Mauna Loa, Hawaii







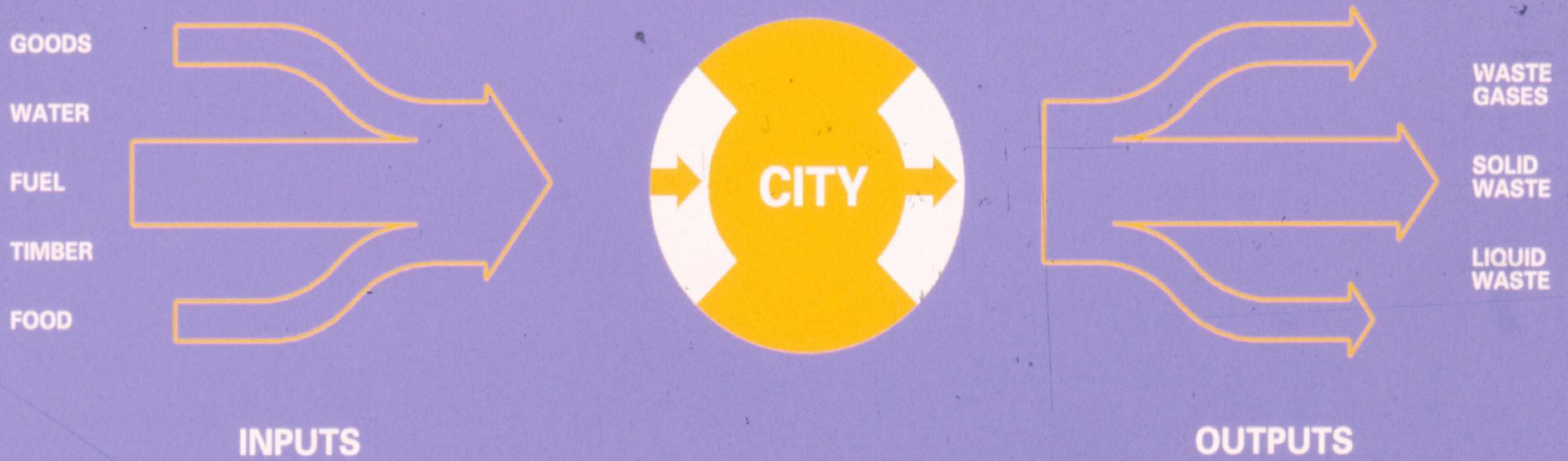
Our Shrinking Earth



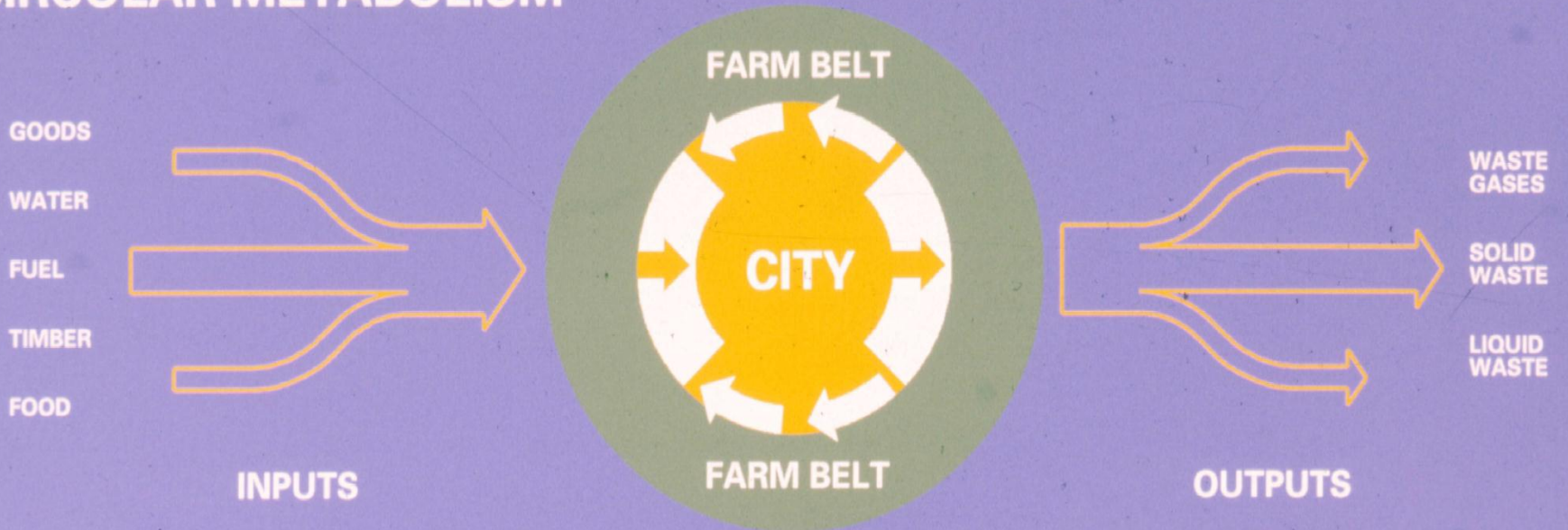
YEAR

Hectares of Land Per Capita

LINEAR METABOLISM

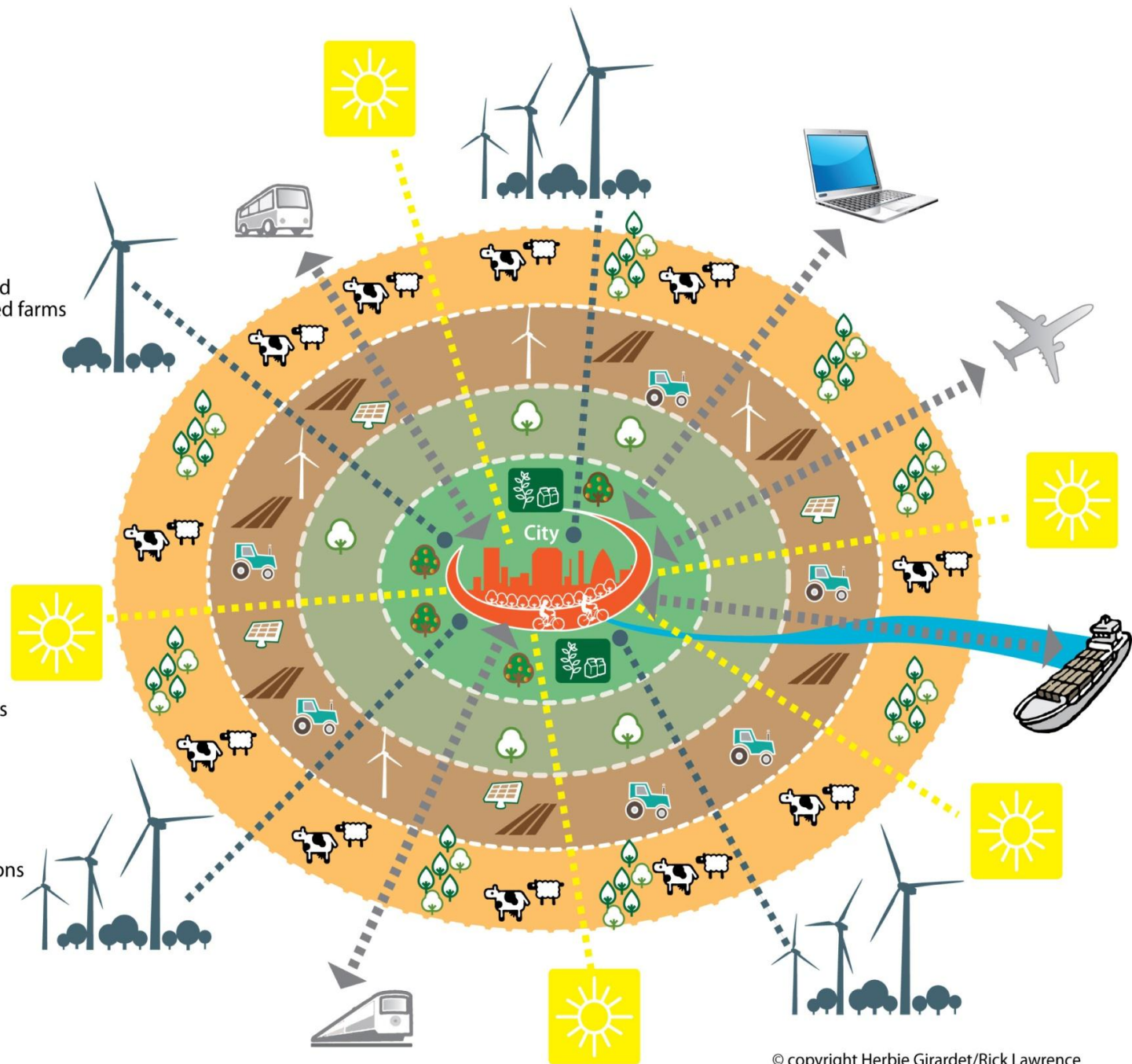


CIRCULAR METABOLISM



"Ecopolis"

-  Central city
-  Navigable river
-  Market gardening and community supported farms
-  Nature park and community orchard
-  Mixed farming and renewable energy
-  Grazing and forests
-  Air imports/exports
-  Road imports/exports
-  Sea imports/exports
-  Global communications
-  Renewable energy
-  Renewable energy



Taipei



Dezhou



Sevilla



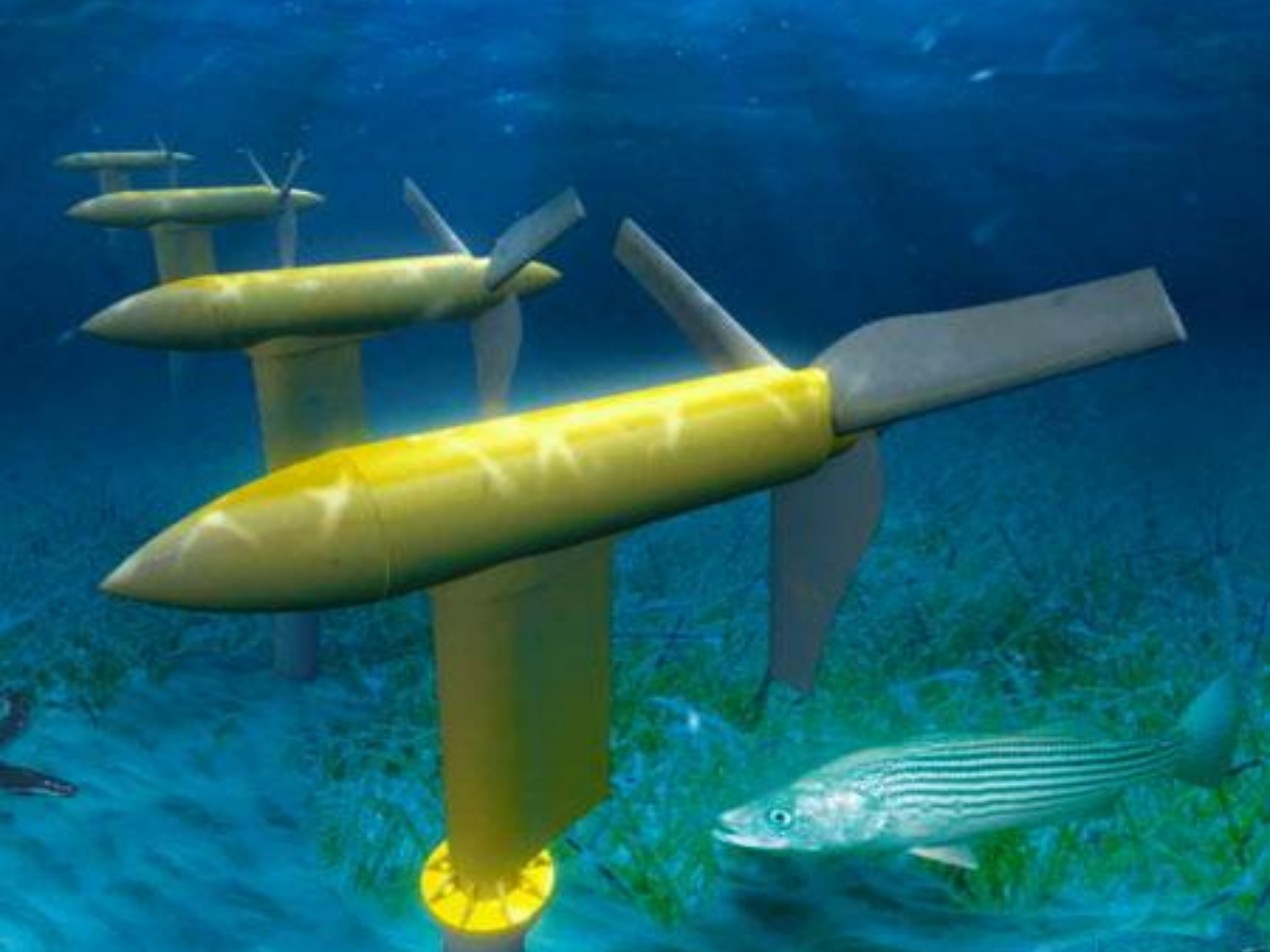




Glasgow







Munich



Germany's Feed-In Tariffs, 2000 – 2012

- **Secure investment in renewable energy with 7% return**
- **380,000 jobs created, €27.5bn turnover for RE companies, €10bn investment per year**
- **Reduced imports: €8 billion euro fuel imports avoided**
- **Reduced emissions: 120 million tonnes of CO2 saved**
- **Eco-benefit: €5.40 less environmental damage per household/ month**
- **Total cost: €6.00 per household/ month**
- **Growing share of power: 2008: 18% of electricity supply**
- **At current growth rates renewables will provide 40% of electricity by 2020, or 100% by 2050**







 ②
Freising-Mitte
1000 m

363









Adelaide, S. Australia





VIA JARDIN

118

metro ligero



metro ligero











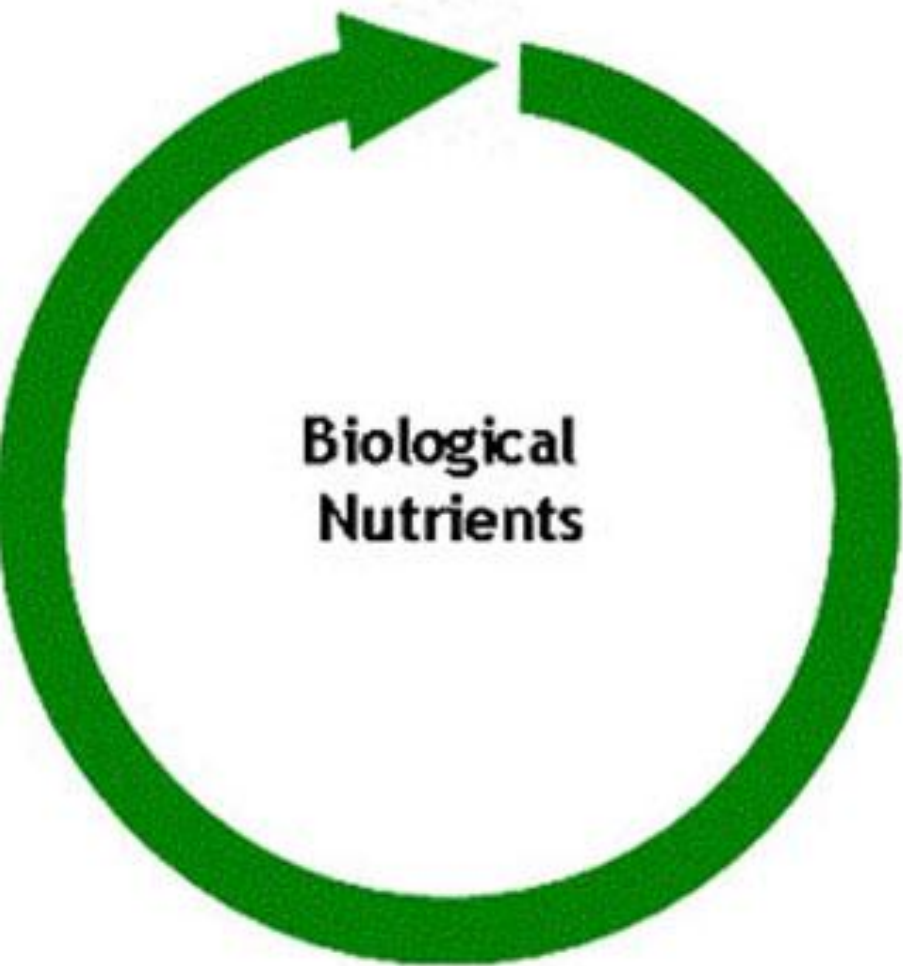




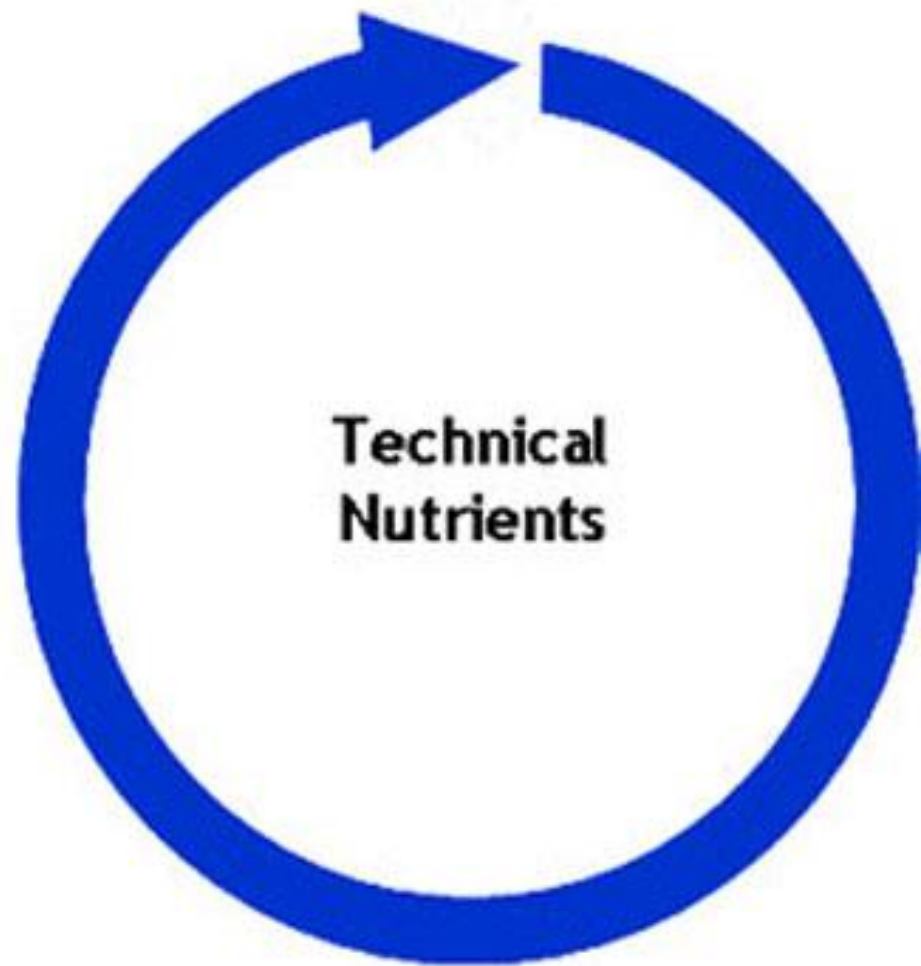




**Biological
Cycle**



**Technical
Cycle**











VIRGINIA
DISTRIBUTION NETWORK

Market gardens

Effluent flow

ANGLE VALE

Effluent discharge channel

Effluent flow

Bolivar Treatment Plant

Wastewater flow

Gulf St Vincent

ADELAIDE
(NORTHERN SUBURBS)



QUALITY FRUIT

eftpos
available here

eftpos
available here



Golden Circle
Premium
GOLD
PINEAPPLE

OTIC FRUIT



FLAVORED
MANGOES
\$4.50

LOWE
MANGOES
\$2.99

YELLOW
PAPAYA
\$3.99

ORANGE
MANGOES
\$1.69





A close-up shot of a person's hand holding a large white sign with the words "GREEN JOBS" in bold, block letters. The word "GREEN" is in green, and "JOBS" is in dark red. The background shows the US Capitol building under a clear blue sky. A yellow banner with the text "POWER SHIFT 2007" is visible in the mid-ground. Other people and green balloons are partially visible in the lower part of the frame.

**GREEN
JOBS**

POWER SHIFT 2007

Adelaide 2012

- **Over 20% of renewable electricity, 40% by 2020**
- **120,000 PV roofs (of 600,000 houses) = 250 mw**
- **20,000 ha of peri-urban horticulture**
- **Recycled waste water used in crop irrigation**
- **Nearly 100% composting of organic waste**
- **Water sensitive development**
- **60% carbon reduction by municipal buildings**
- **1000s of new green jobs**
- **Nearly 3 million trees planted on 2000 ha**

Shanghai













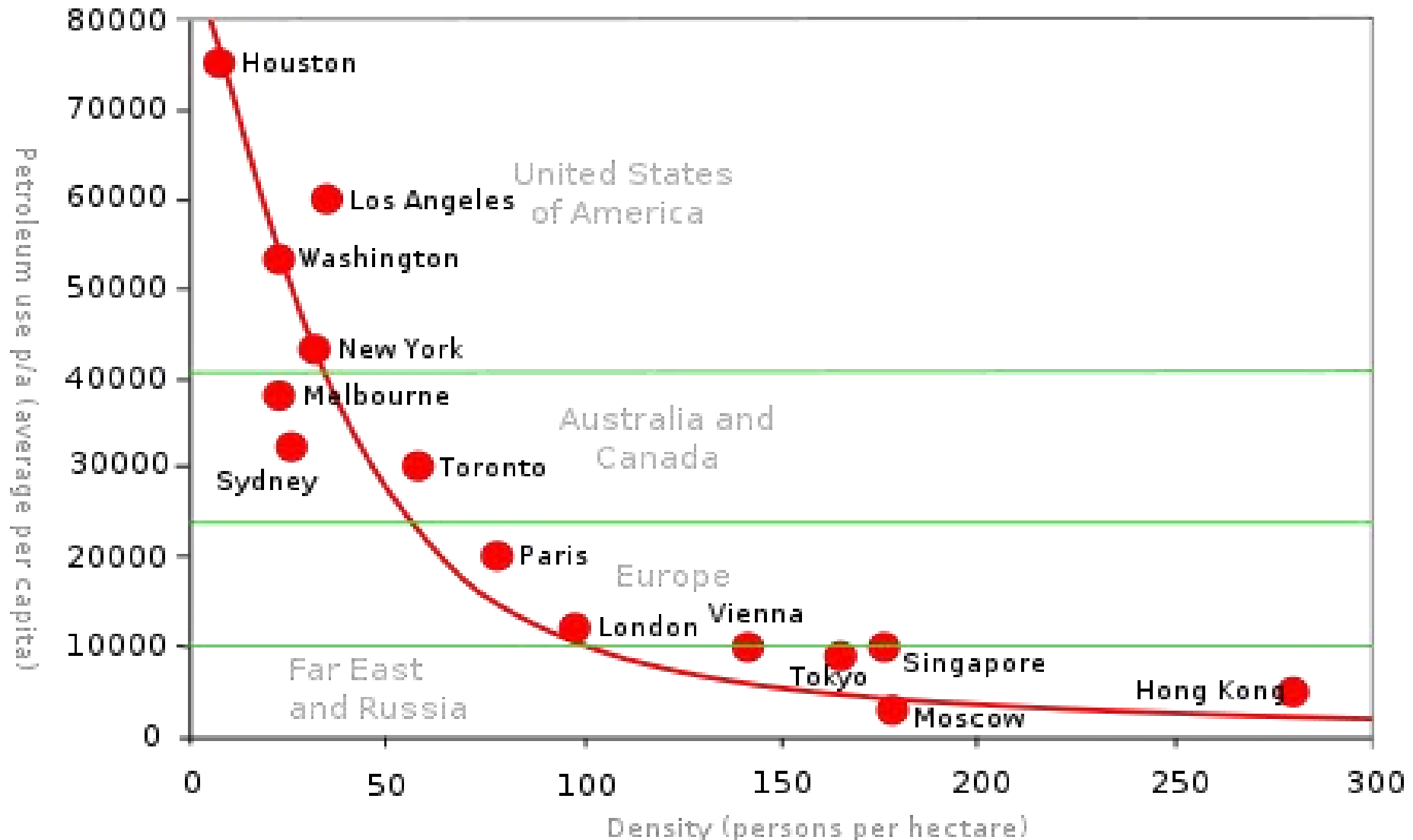




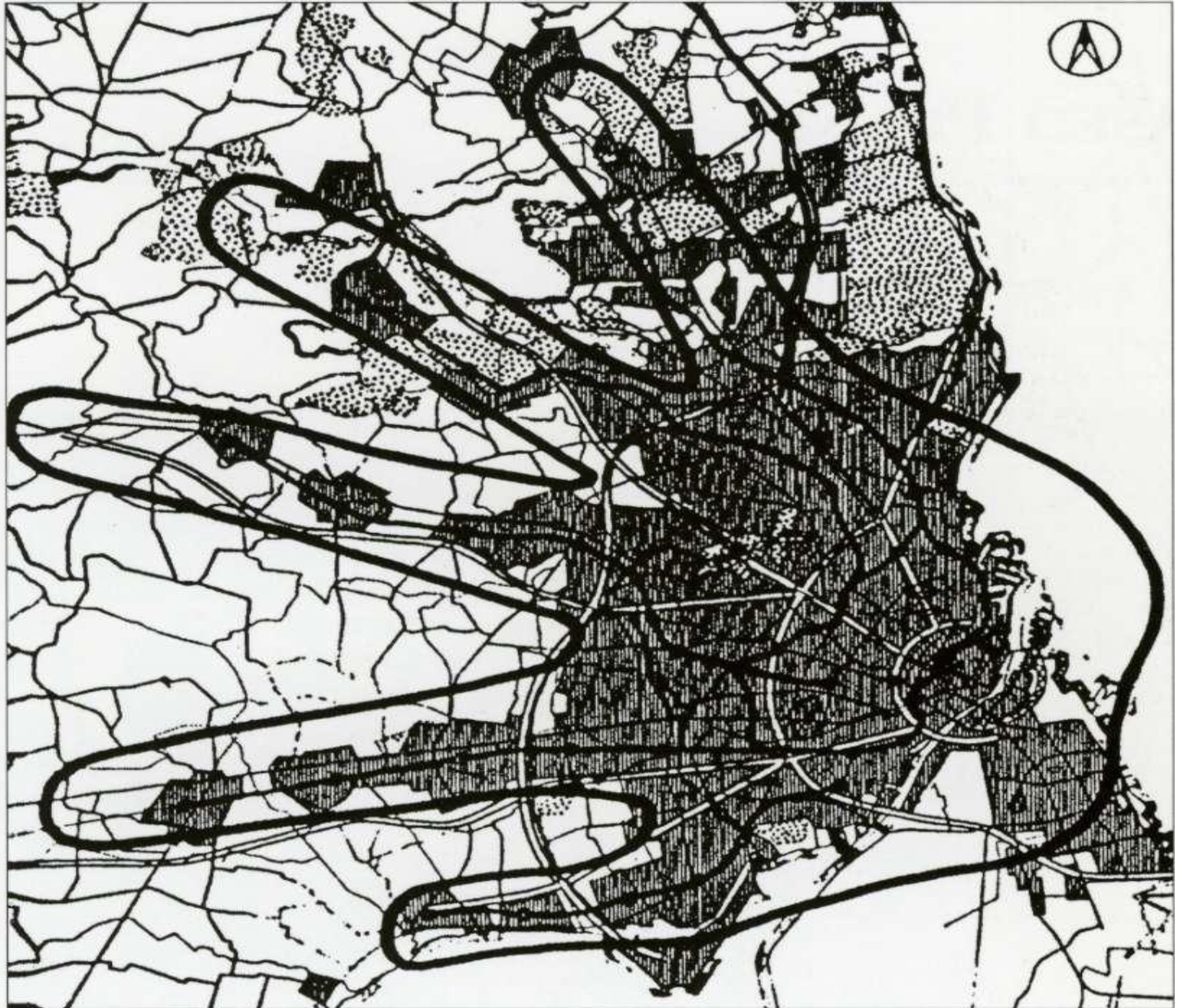


Relationship between Transport and Land Use

A commonly used study of 32 cities by Newman & Kenworthy in 1989 concluded that there was a strong link between urban development densities and petroleum consumption.



Copenhagen





"Petropolis"



Central city



Navigable river



Air imports/exports



Road imports/exports



Rail imports/exports



Sea imports/exports



Global communications



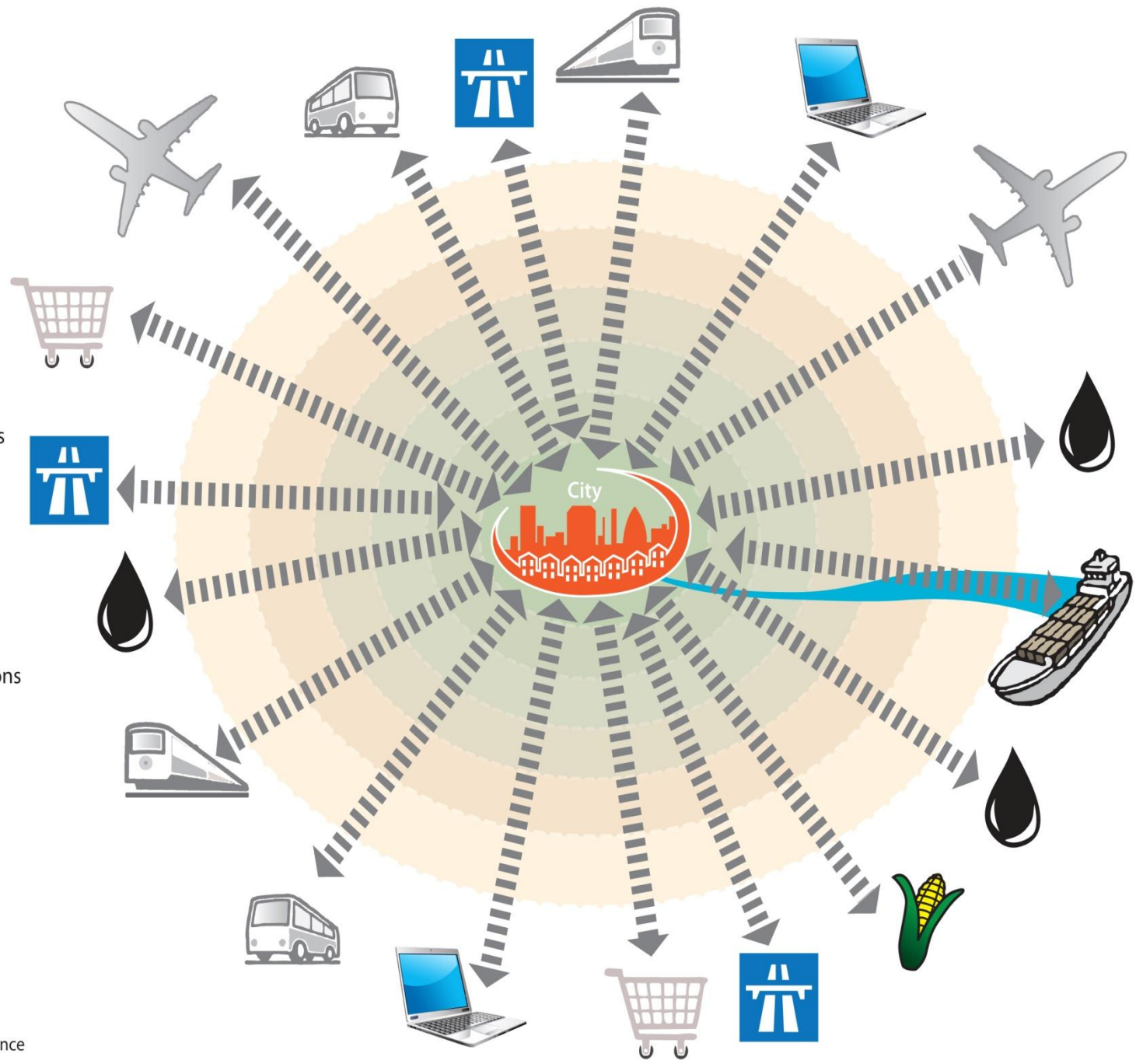
Oil imports



Food imports



Motorway links



icopolis"



Central city



Navigable river



Market gardening and community supported farms



Nature park and community orchard



Mixed farming and renewable energy



Grazing and forests



Air imports/exports



Road imports/exports



Sea imports/exports



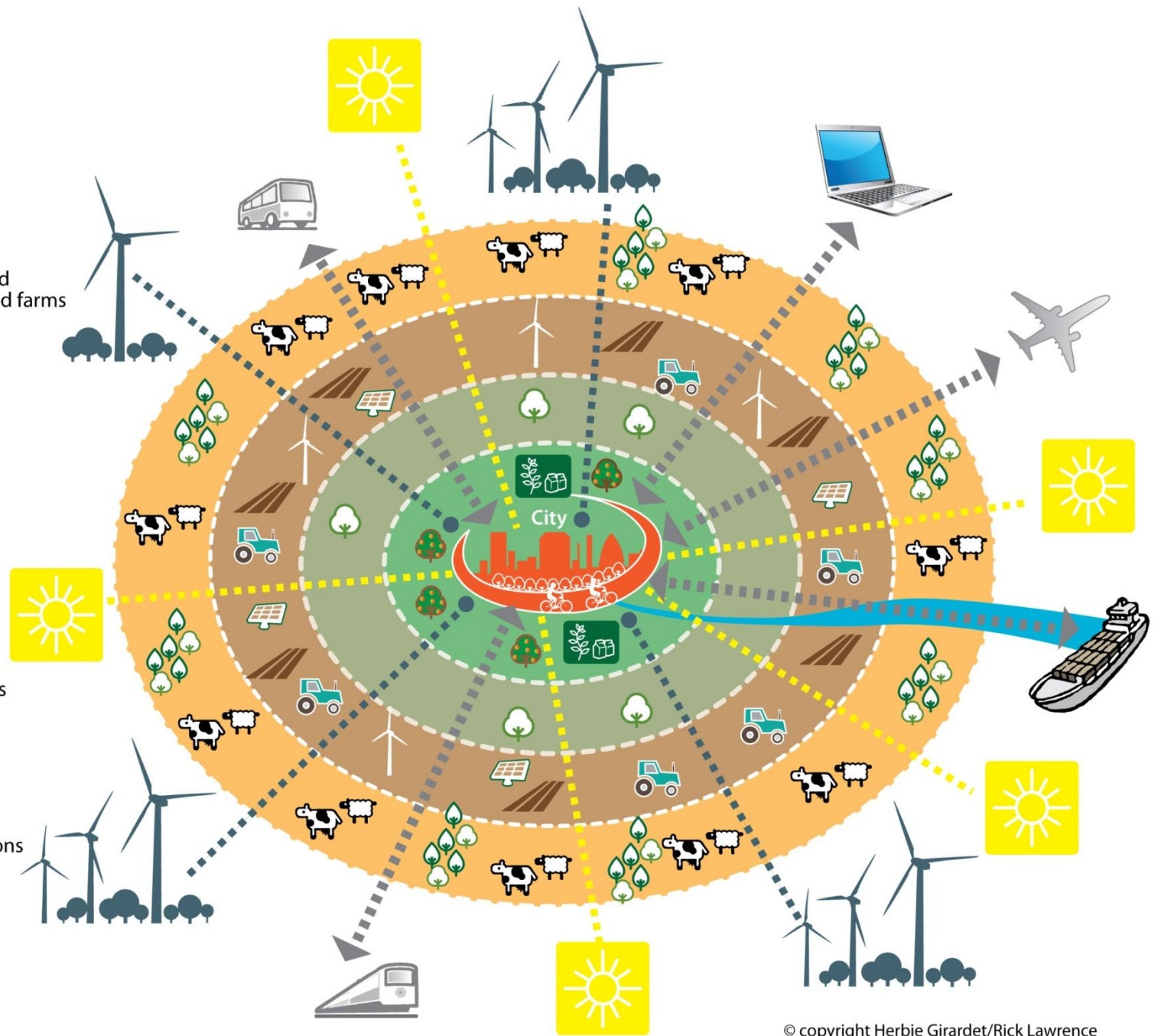
Global communications



Renewable energy



Renewable energy



Tianjin, Singapore



Masdar, Abu Dhabi



Food City, Dubai



Regenerative cities: The key issues

- **Making urban systems compatible with the world's ecosystems**
- **Regenerative energy systems**
- **Regenerating soils**
- **Replenishing plants nutrients**
- **Regenerating forests**
- **Regenerating water courses and lakes**
- **Regenerating community life**

A GIANT FOOTPRINT

The city on the left wastes resources:

It gorges itself on meat, with animals fed mainly on imported feeds

It uses timber and paper products without concern about their forest origins

It emits vast amounts of CO₂, requiring vast areas of vegetation to reabsorb it

A NIMBLE FOOTPRINT

The city on the right takes another chance:

Its citizens limit their meat consumption, preferring vegetable foods

Timber and paper are used frugally and efficiently

Tree planting schemes assure reabsorption of its limited CO₂ output





Books and Reports

- **Creating a Sustainable Adelaide, 2003,**
www.thinkers.sa.gov.au/lib/pdf/Girardet_Report.pdf
- **Cities, People Planet, 2004 & 2008**
- **A Renewable world, 2009**
- **Regenerative Cities, 2010**
- **Regenerative Adelaide, 2012**

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