

Surfing the Waves

Infrastructure Interdependency, Economic Growth and Investment

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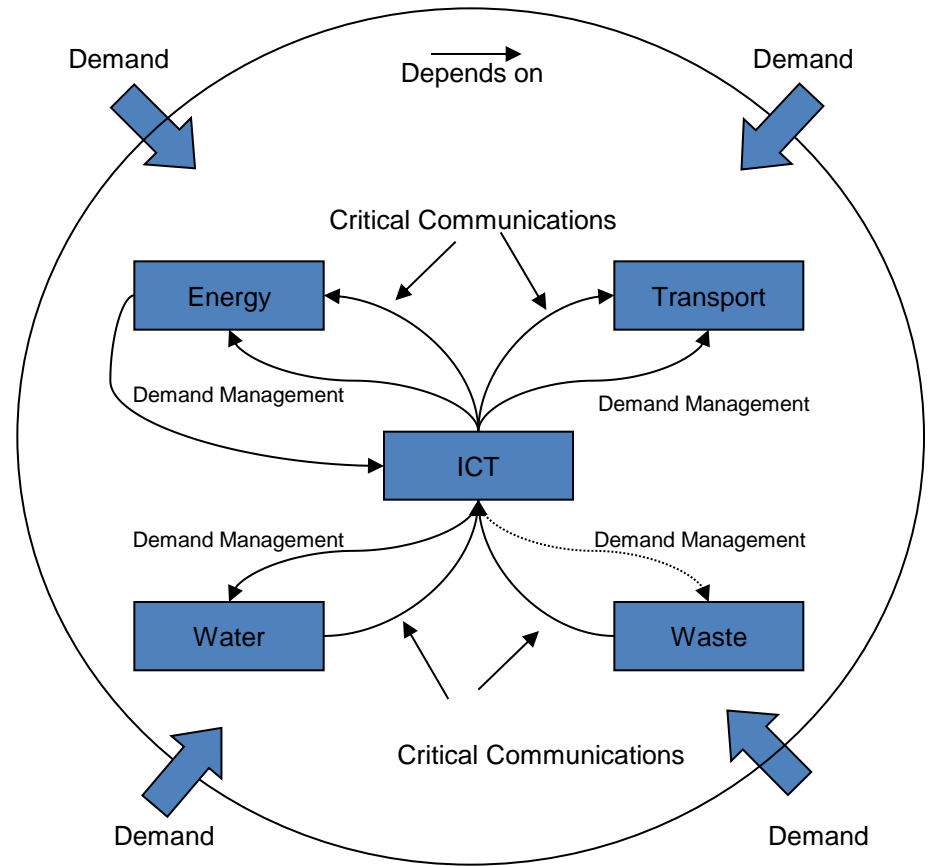
Bristol University 30/04/12

- Inspired by response of HMT to initial work
- Traditional economic modelling for growth
 - Considered individual elements of infrastructure
 - Picked up co-location, sharing
 - Did not appear to model interdependency from either a performance, resilience or economic perspective
 - Considered economic benefits of 'THIS' but not the consequences for 'THESE'

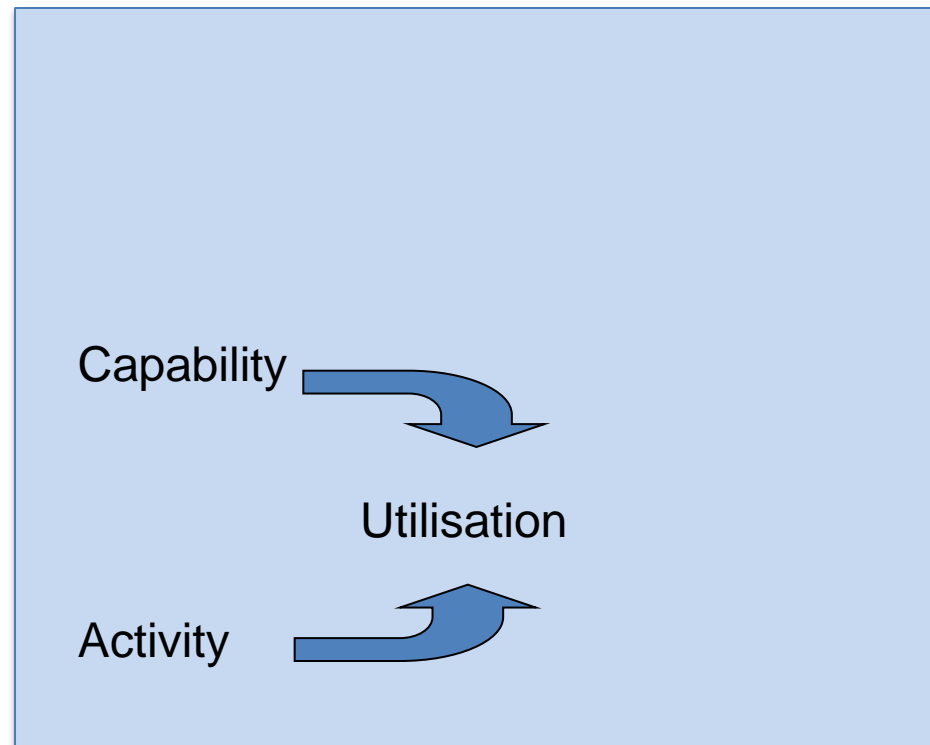
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- Need a model that accepts and values interdependency
- Also need to understand that:
 - time is an important element
 - economic benefits do not respect either the budgetary or electoral cycles

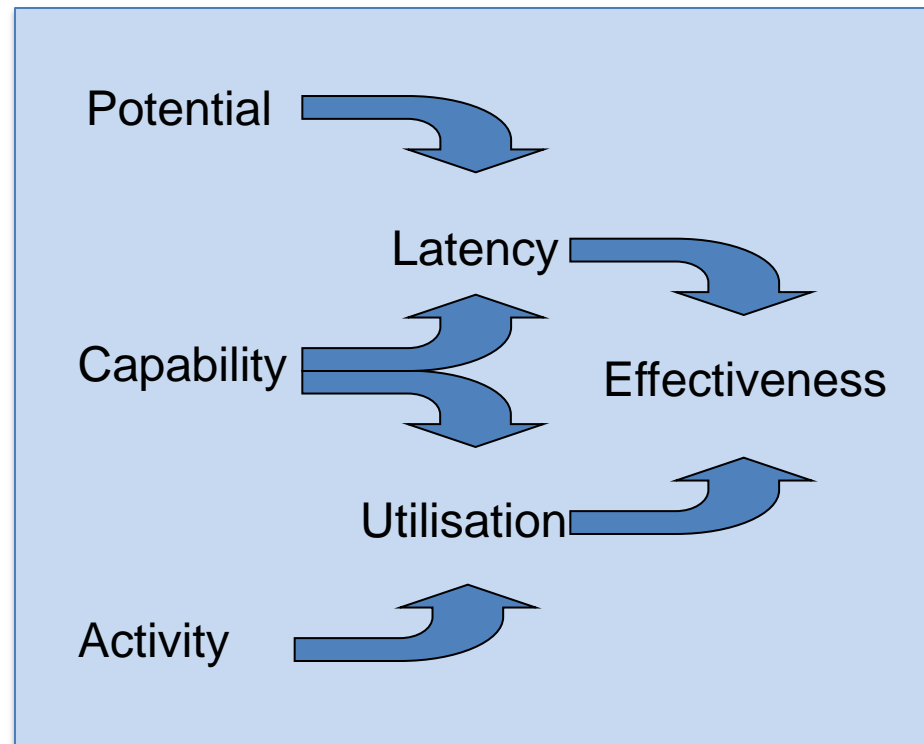
- “The UK Infrastructure is a network of networks” CST 2009
- Each element-
 - Energy
 - Transport
 - ICT
 - Water
 - Waste
 - depends to some degree on the others
- Might models that deal with interdependency provide the feedstock for economic modelling?



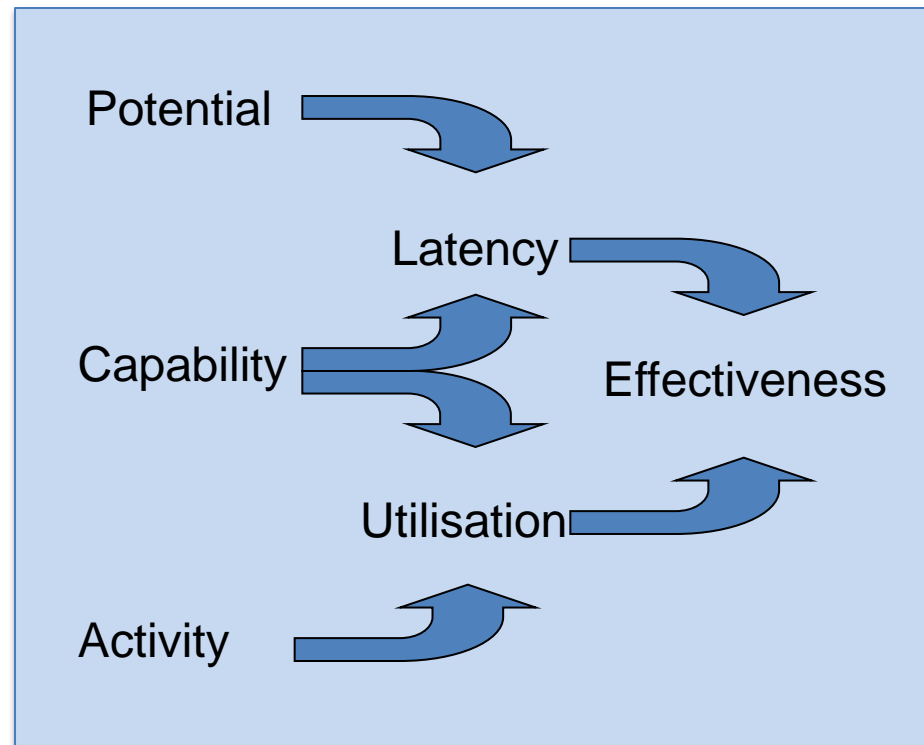
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 - a level of productive **activity**
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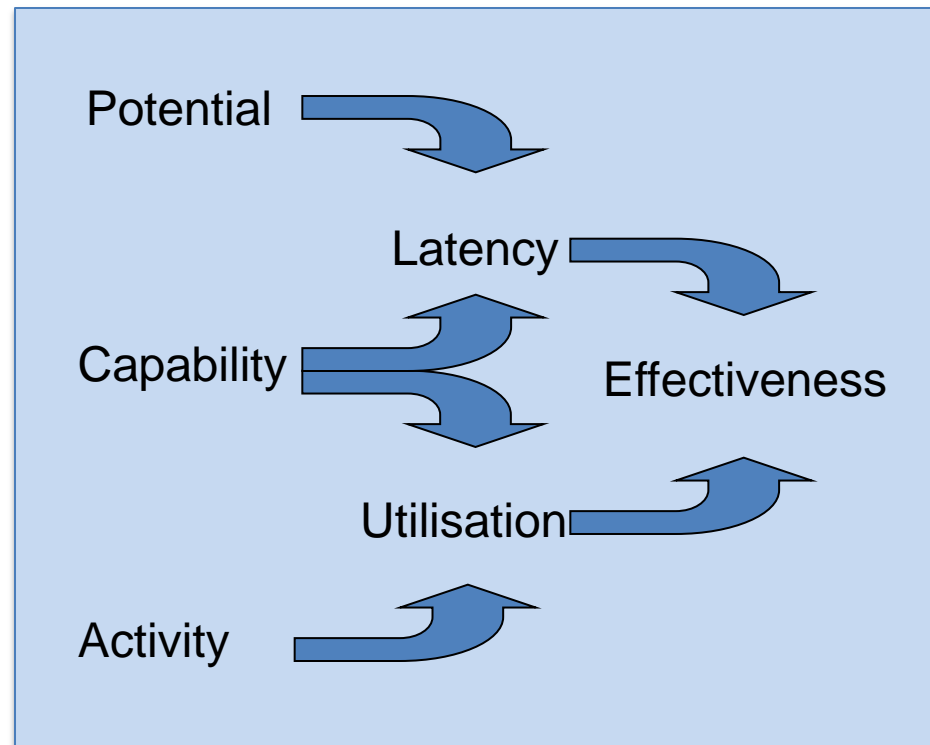
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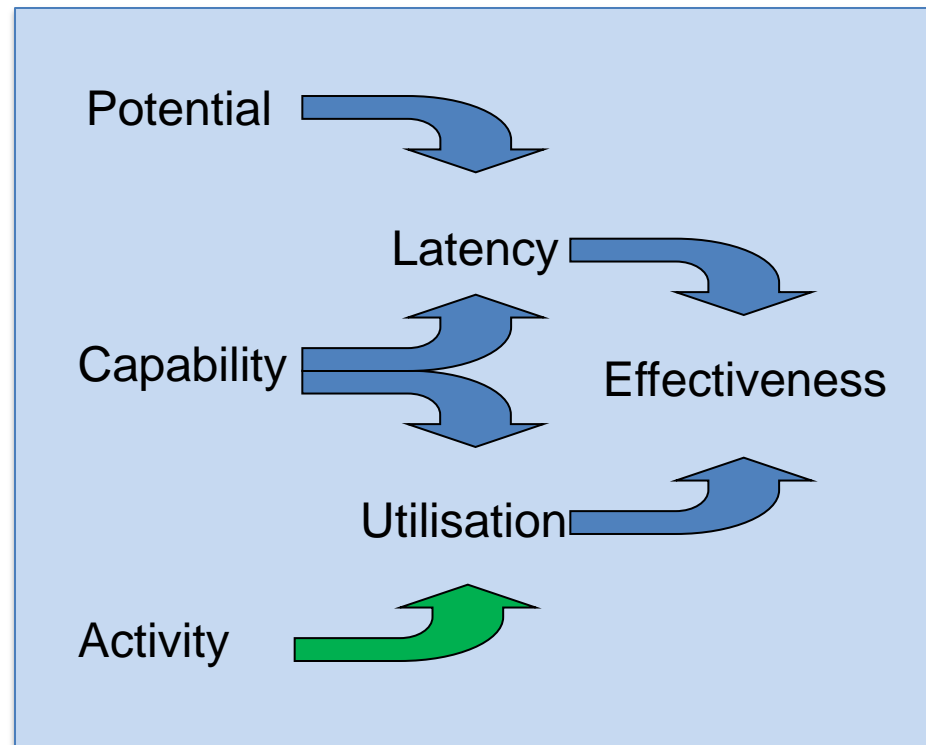
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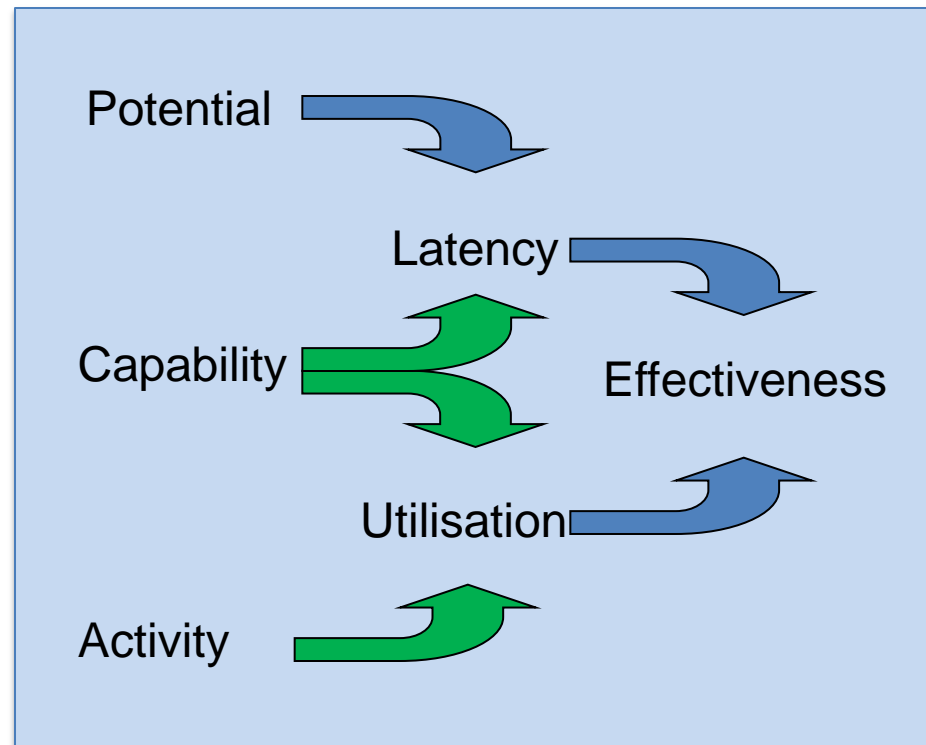
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- Increased activity without investment generates growth



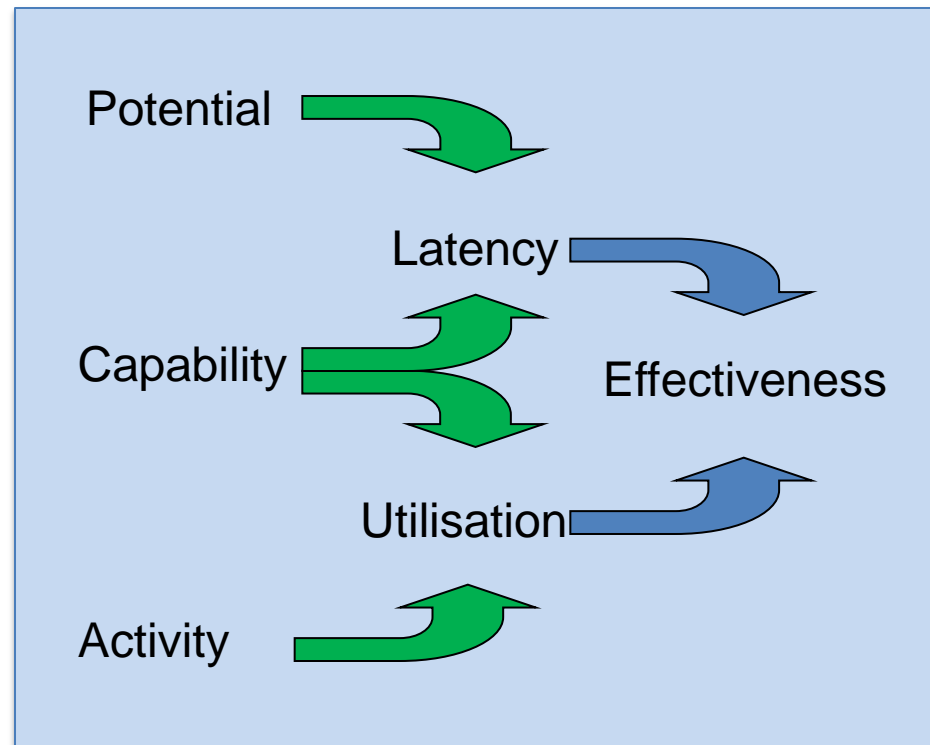
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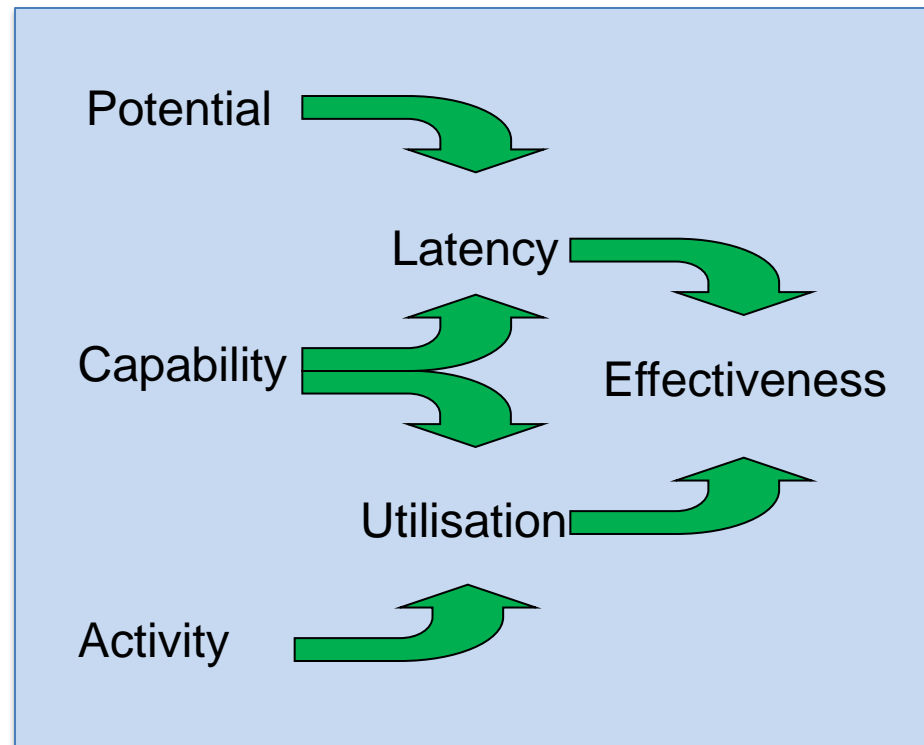
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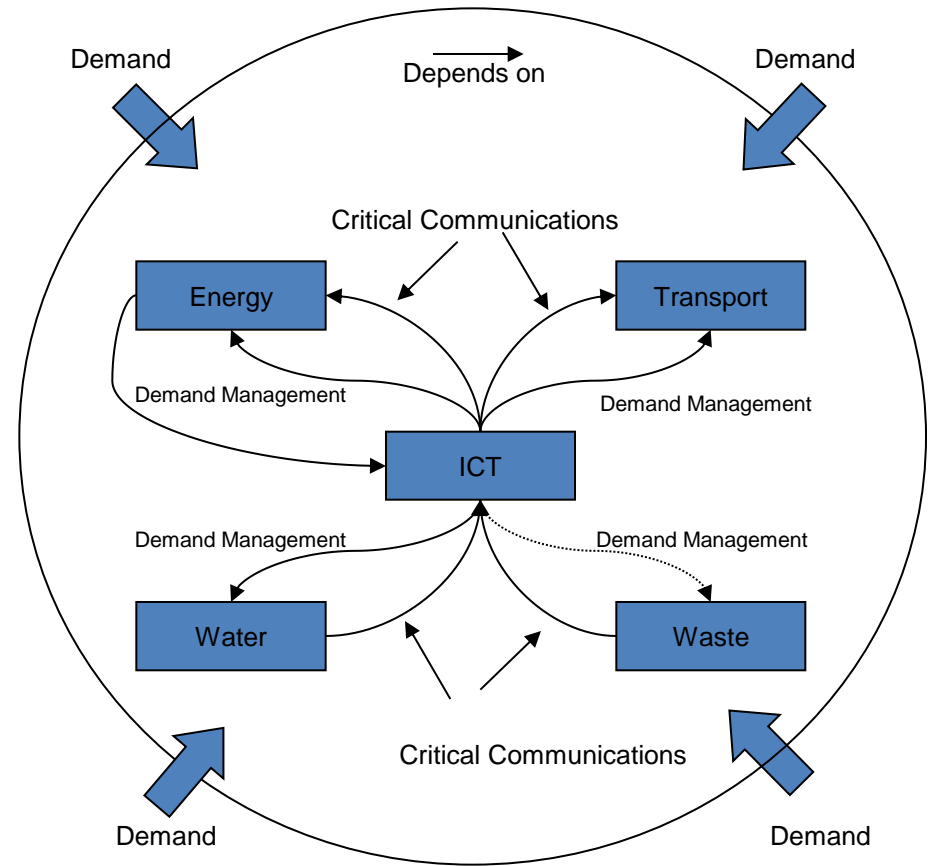
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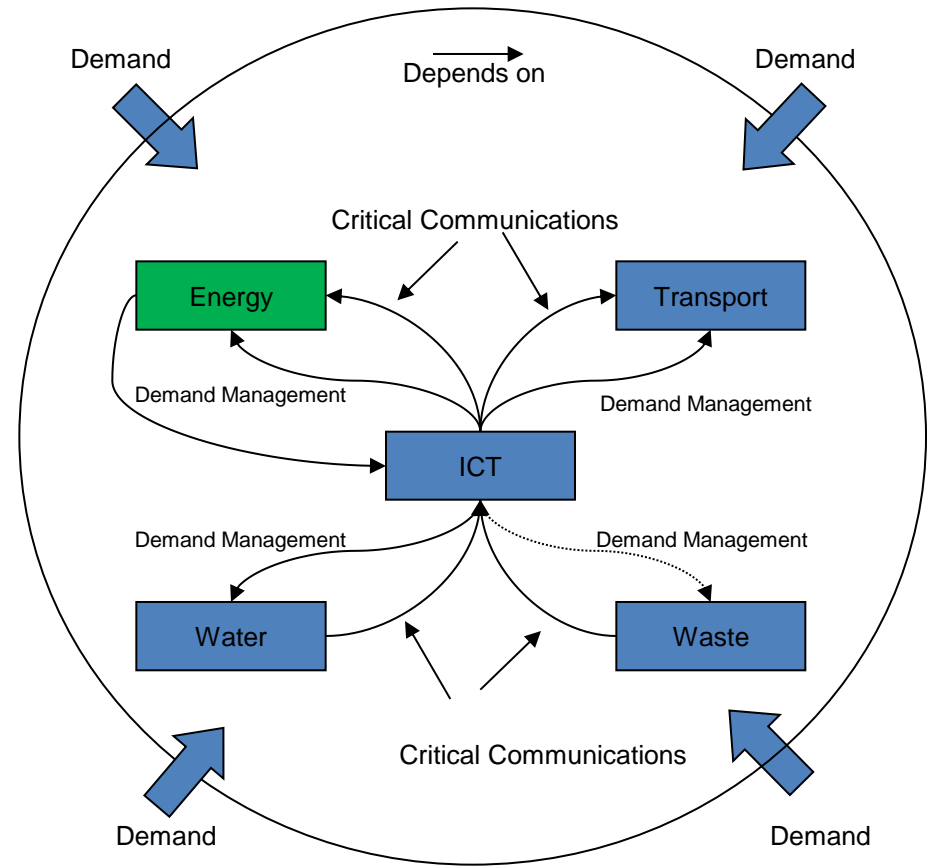
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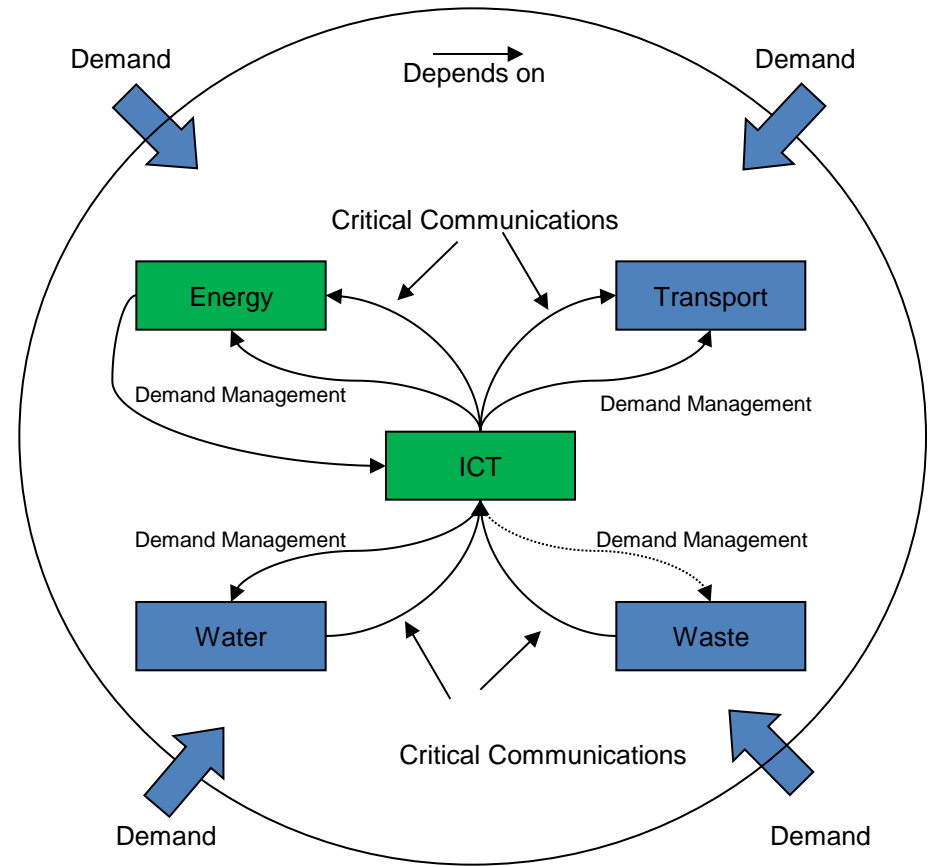
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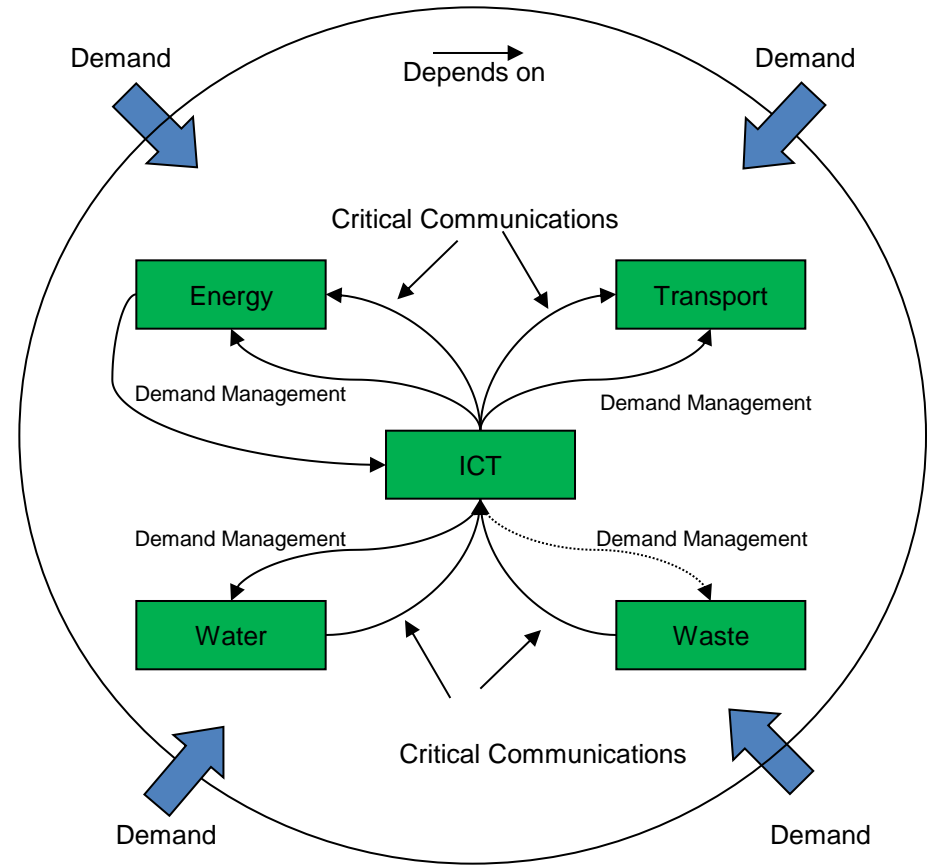
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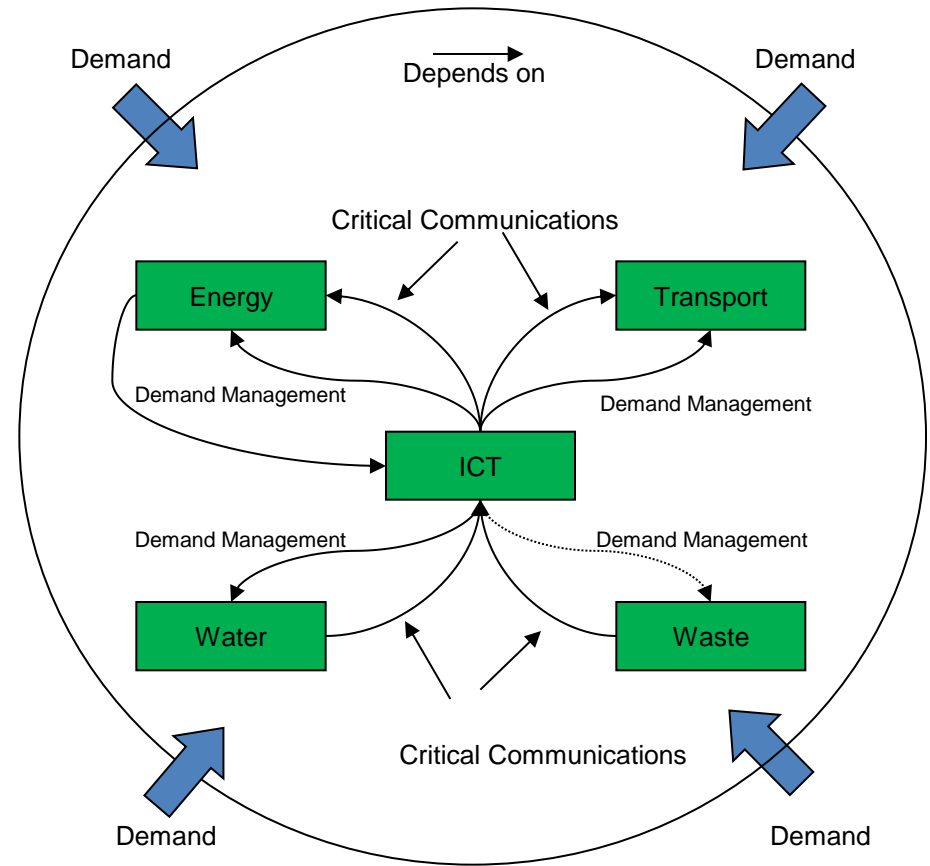
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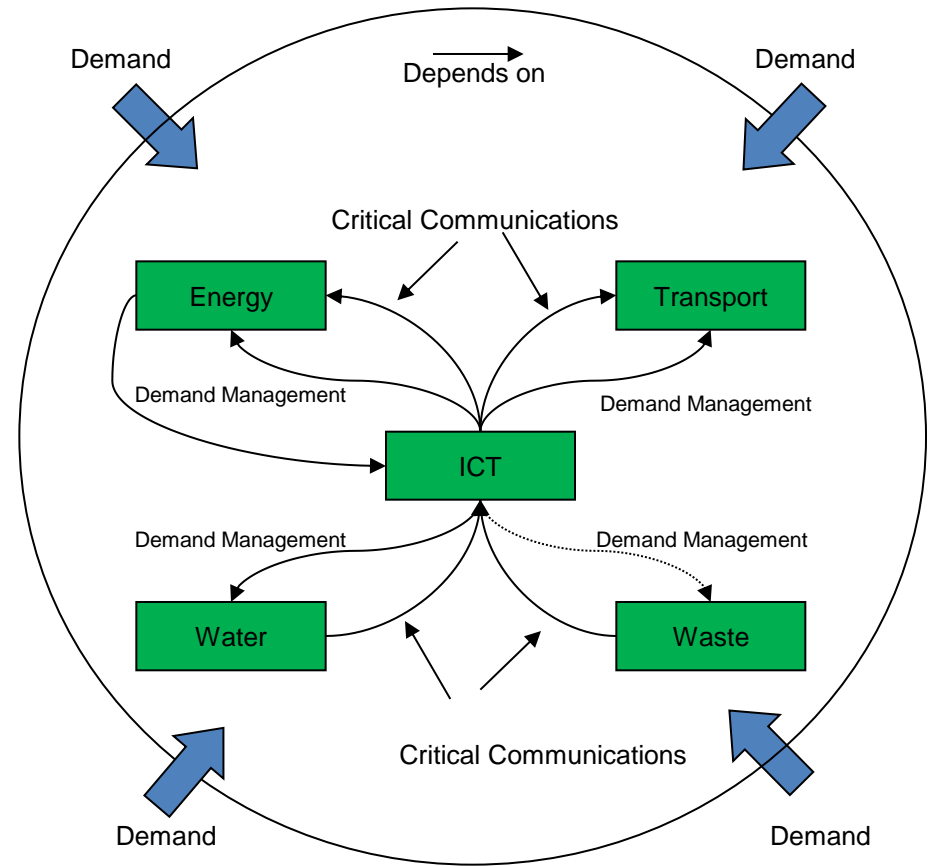
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 - or failing or in need of replacement
- The economic case is hard to make for the replacement or upgrade
- Locally it costs too much and in itself does not provide sufficient additional value
- Perhaps, the economic benefit is embedded in its enabling role?
- Perhaps, the benefit can be measured:
 - elsewhere in the network of networks of the primary infrastructure
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- We need to understand investment and growth in a systemic sense

- Infrastructure investment works in waves over time:
 - Wave 1: Design and build
 - Wave 2: Maintain
 - Wave 3: Exploit

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 - Lasts the life of the phase (2-10 years)
 - Enables growth but in itself perhaps adds little direct value
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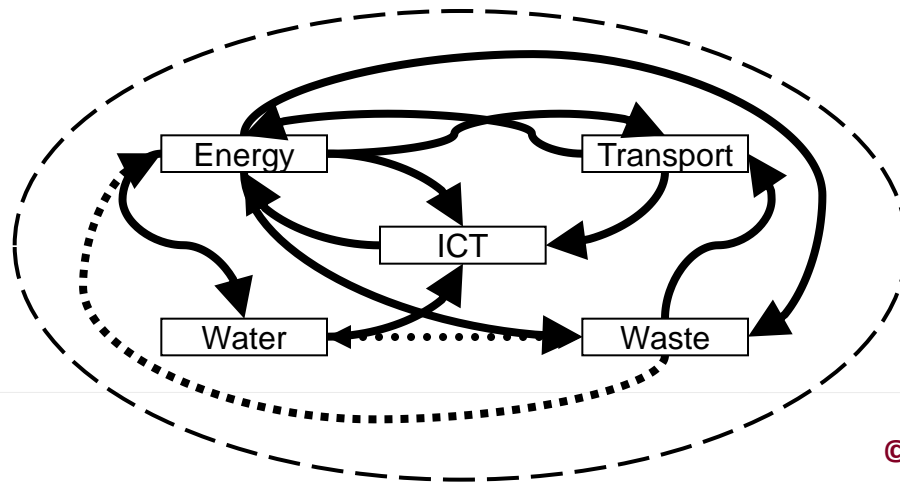


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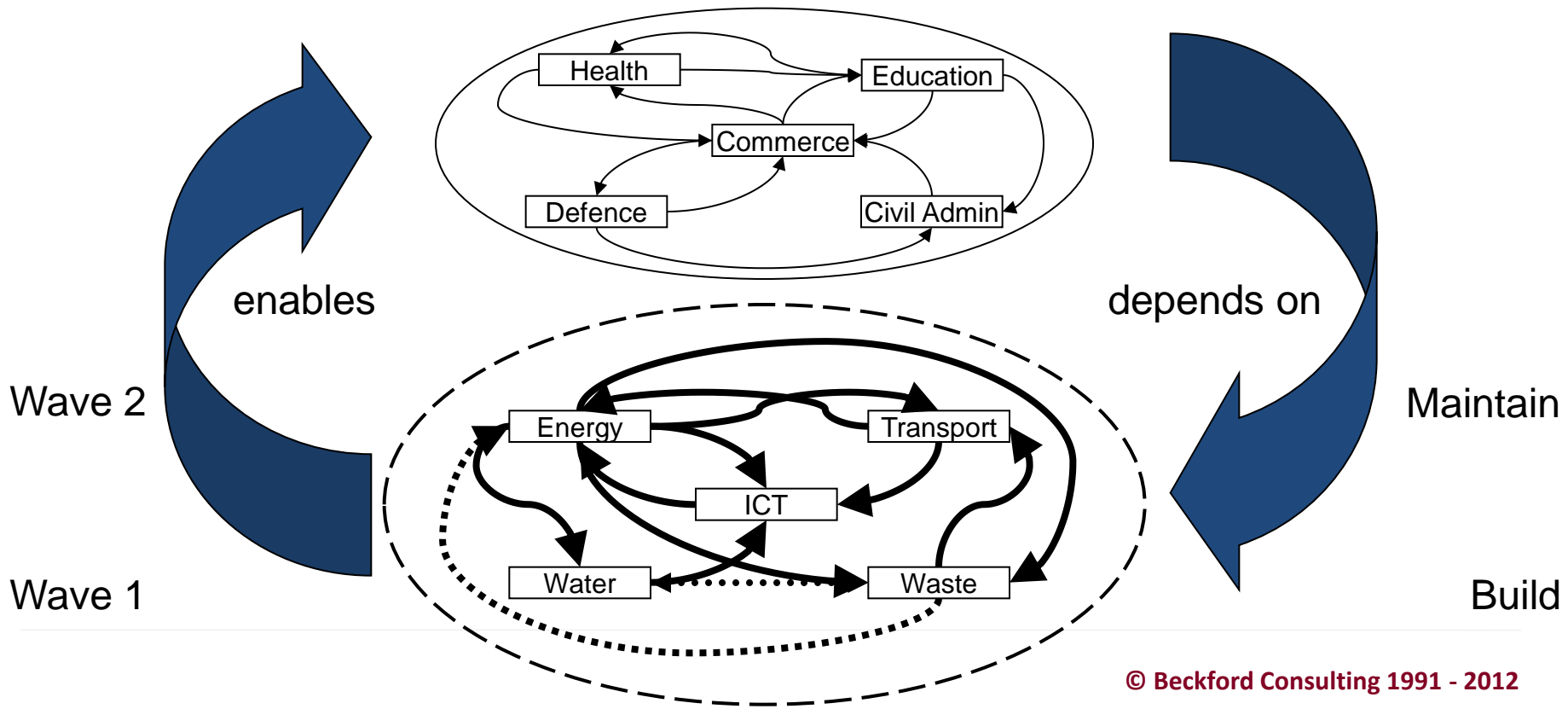


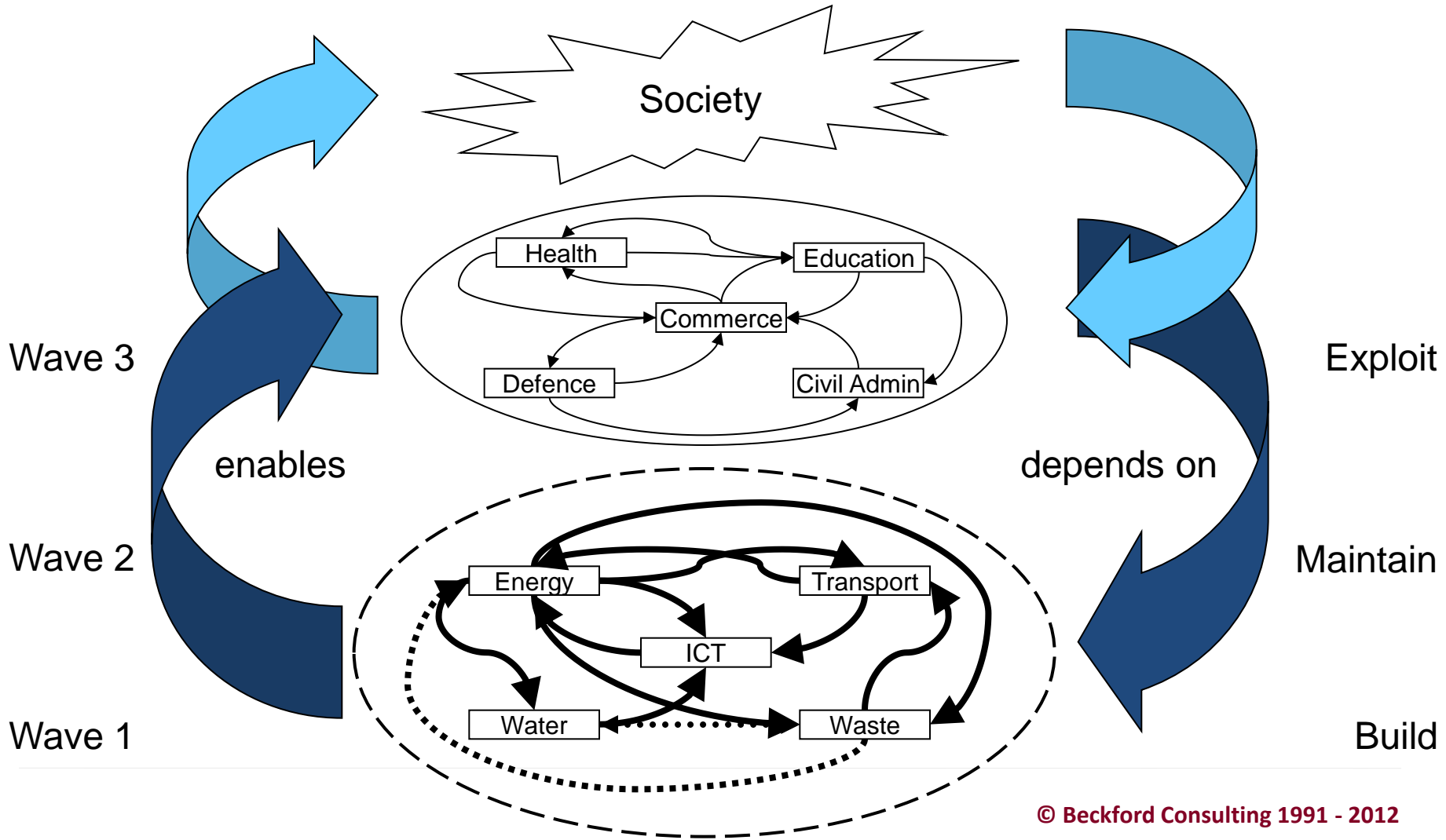


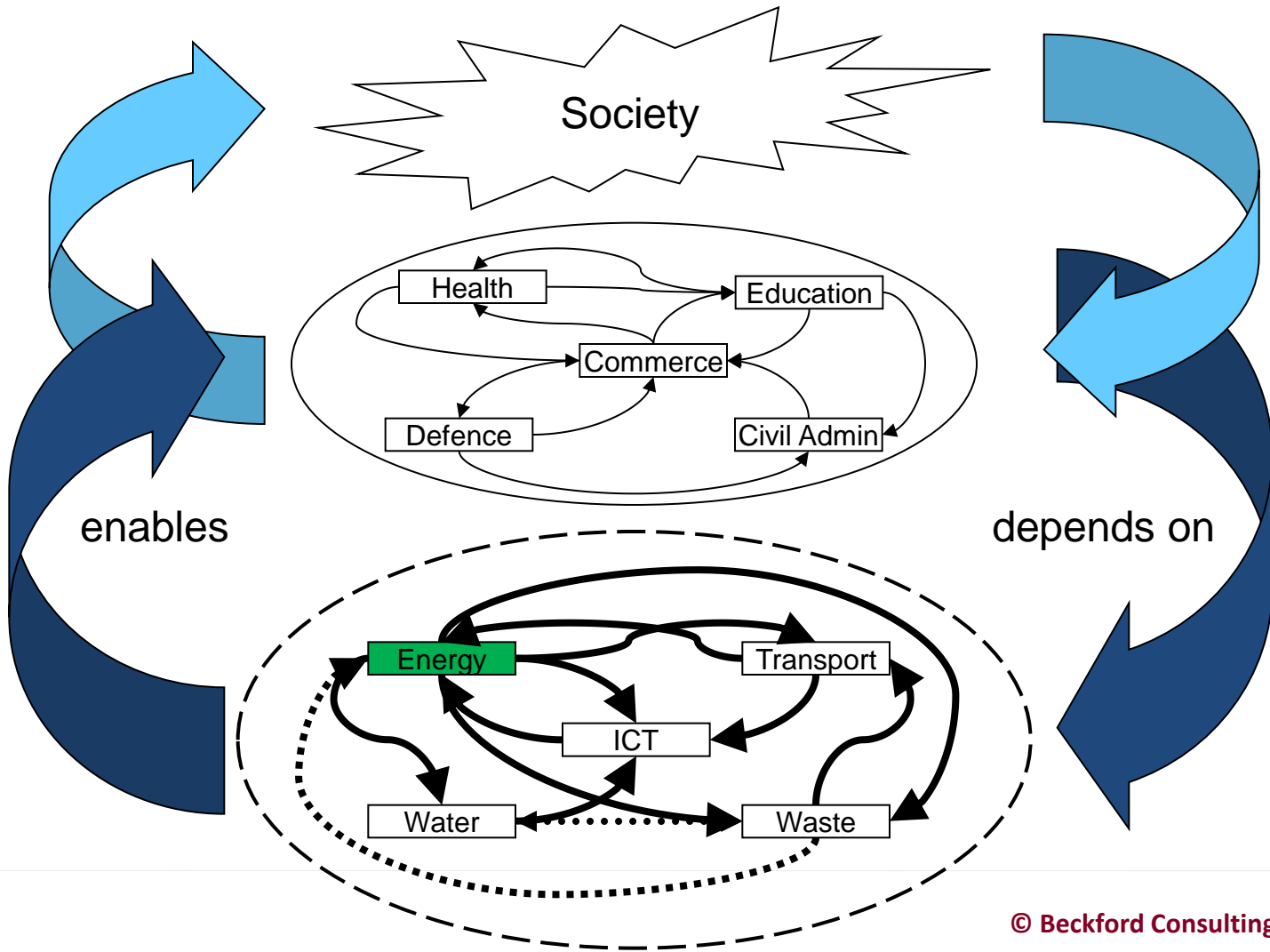


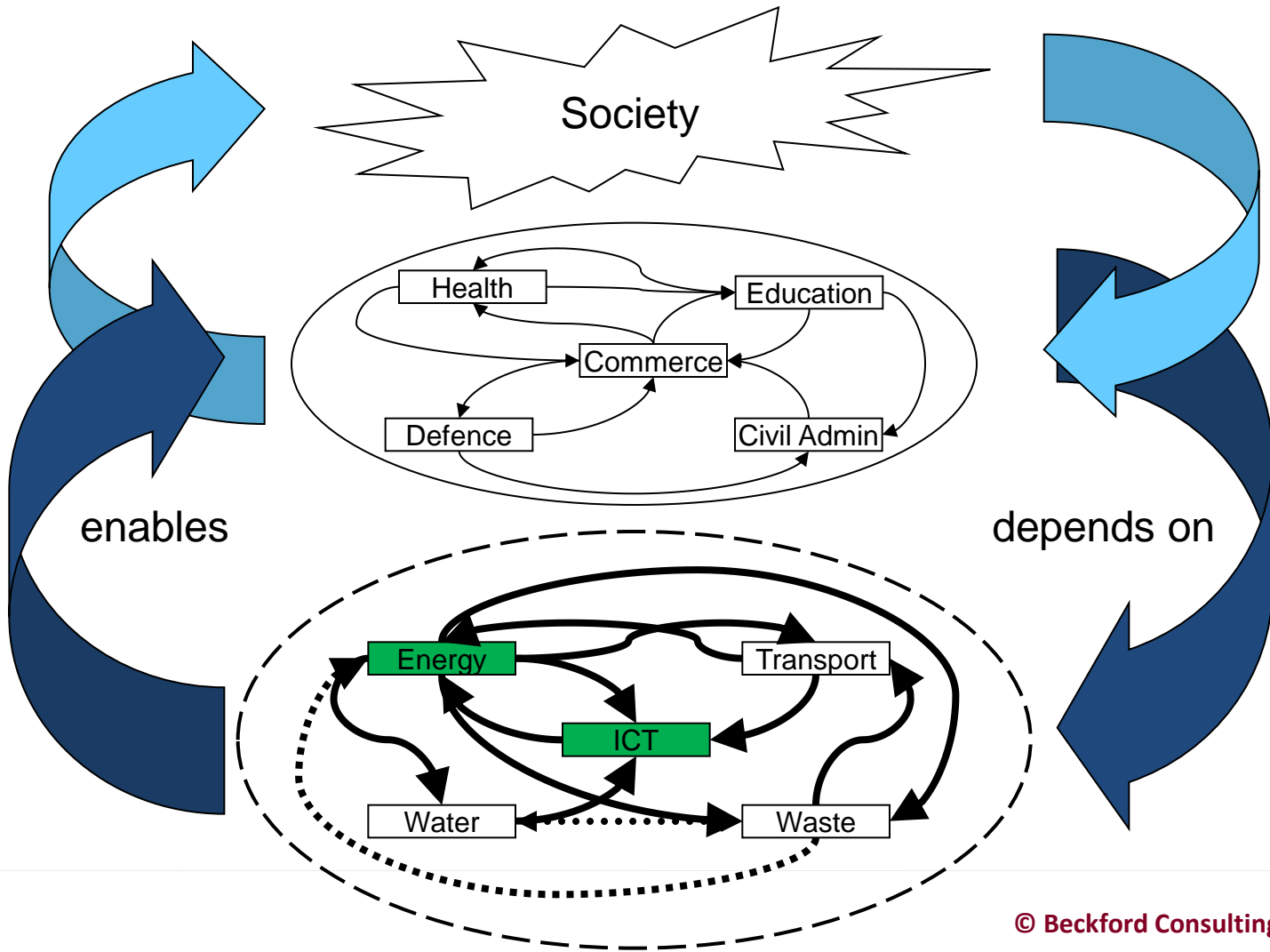
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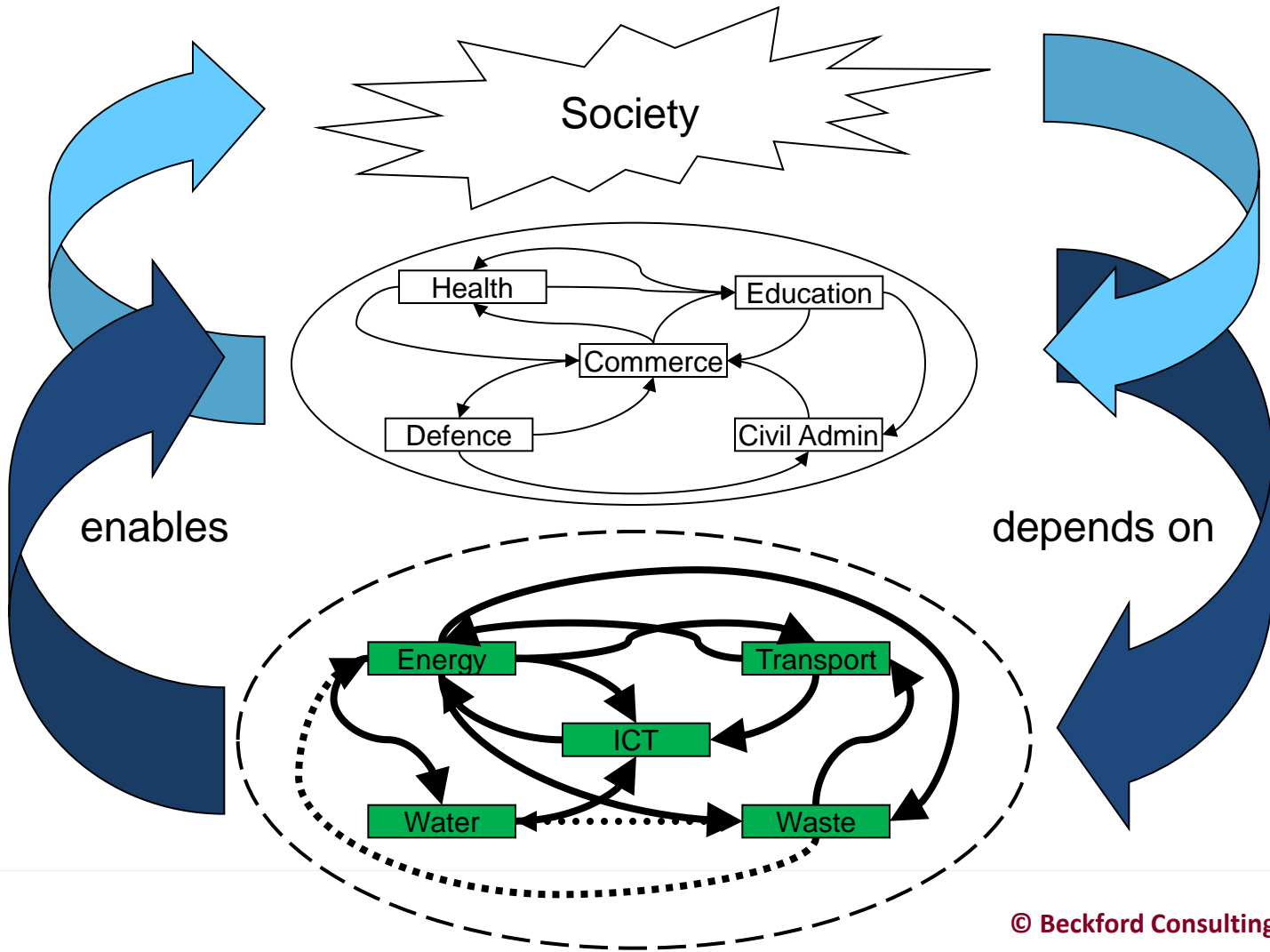
Build

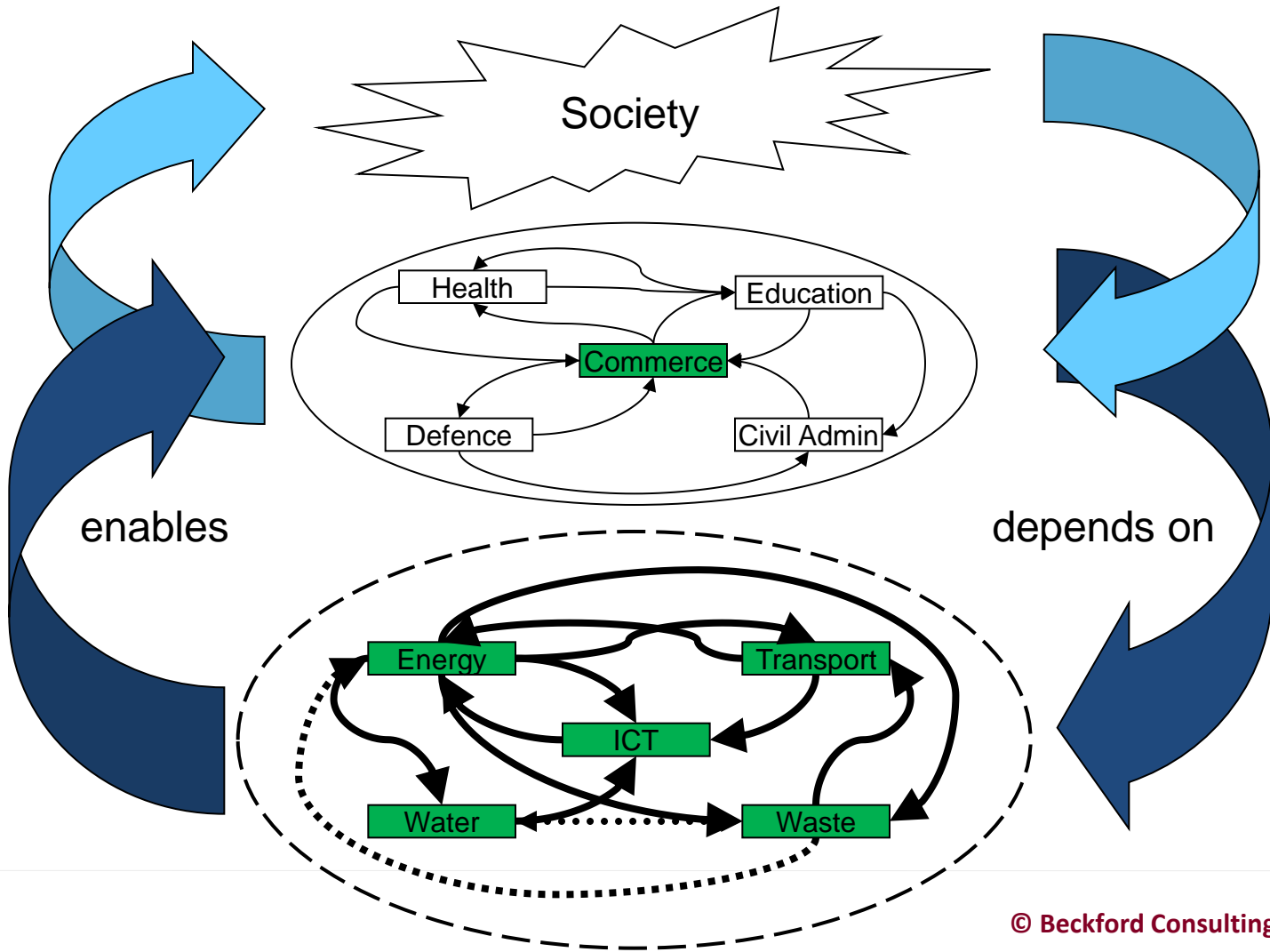


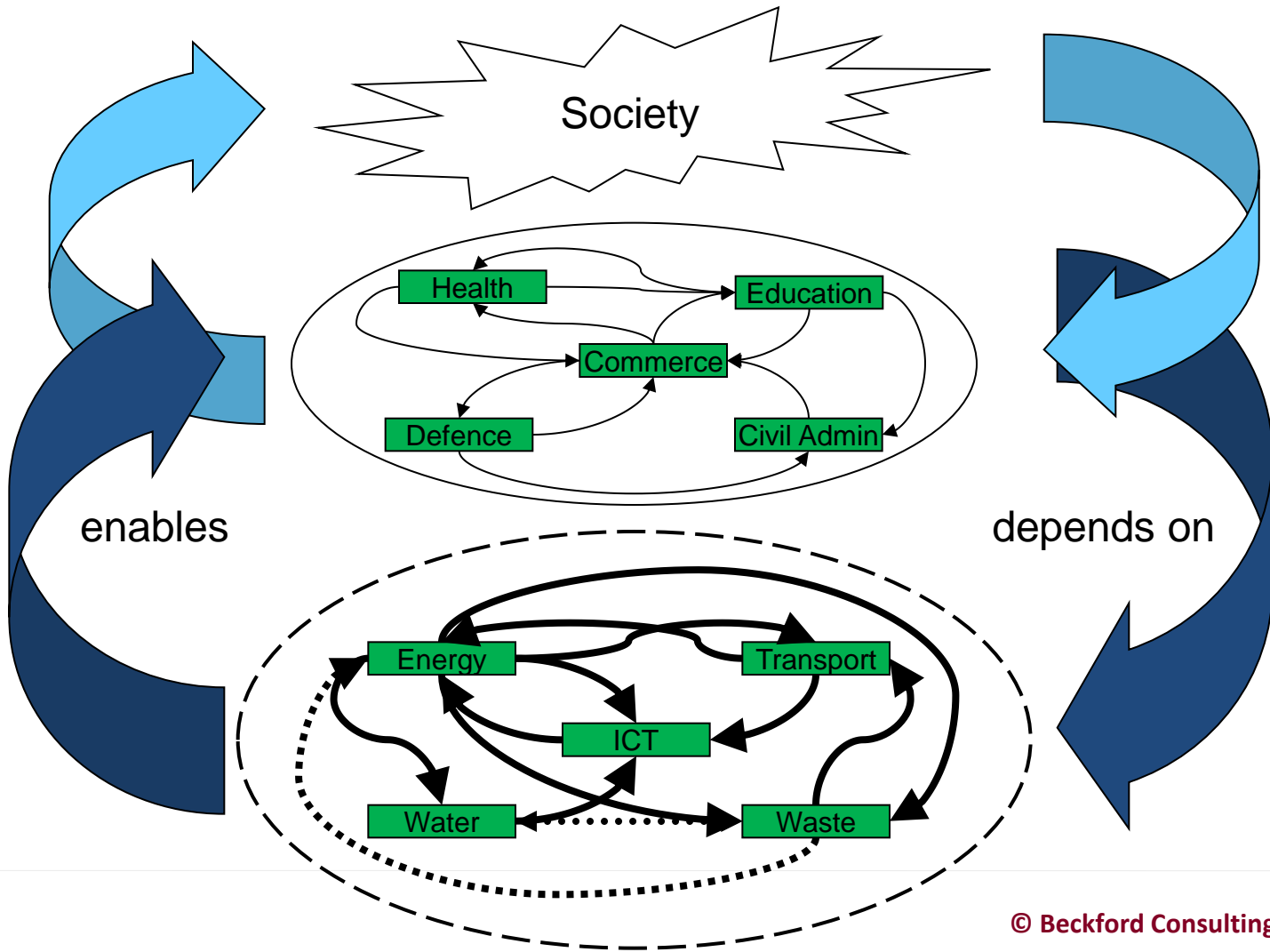




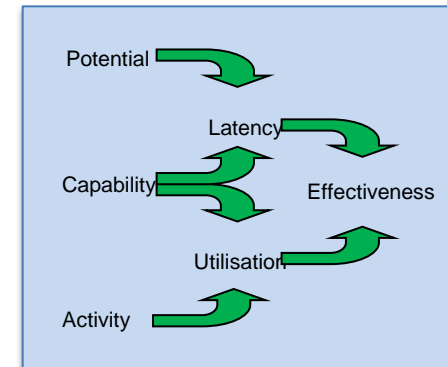








- Suggestion is that we need to develop and adopt systemic economic models to synthesise and understand how to realise the potential of:
 - Economic and social benefit from:
 - Individual entities
 - Co-located and co-dependent entities
 - Interdependent networks
 - Networks of Networks
 - Develop and test systemic hypotheses in economic terms
 - Address the challenges of:
 - integrated investment by fragmented owners
 - long-term, inter-generational infrastructure investment
 - short term electoral and budget cycle thinking



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