A Good Disruption –
Redefining growth in the 21st century

FIRST MEETING FOR THE SEVENTH REPLENISHMENT OF THE
GEF TRUST FUND
Paris, March 29nd 2017

SYSTEMIQ
Congruence, anomaly, or new paradigm?

SOURCE: Thomas Kuhn, Structure of a Scientific Revolution (1964)
We are seeing a “great divergence”

U.S. labor productivity, GDP per capita, employment, median income, and Global GPI per capita
Indexed to 1947

SOURCE: Federal Reserve Bank of St. Louis, Brynjolfsson and McAfee, Kubiszewski et al. (2013)
Annual GDP Growth rates in Germany, France, and the USA ...

SOURCE: Insee, Statistisches Bundesamt, U.S. Bureau of Economic Analysis
Growing poor – when costs outweigh the benefits

Progress per capita\(^3\), globally, 1990-2010, real terms

<table>
<thead>
<tr>
<th>Considerations</th>
<th>Economic Capital</th>
<th>Social</th>
<th>Natural</th>
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<tbody>
<tr>
<td>Gross Domestic Product</td>
<td>2,0</td>
<td>✓</td>
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<tr>
<td>Human Development Index</td>
<td>0,8</td>
<td>✓</td>
<td>✓</td>
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<tr>
<td>Genuine Progress Indicator(^1)</td>
<td>-0,1</td>
<td>✓</td>
<td>✓</td>
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<tr>
<td>Inclusive Wealth Index (IWI)(^2)</td>
<td>-0,2</td>
<td>✓</td>
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1. 1990-2005, as later data not available globally.
2. IWI exists in two versions, one unadjusted, and one where adjustments are made for environmental damage, oil capital gains, and total factor productivity. The adjusted version is shown here.
3. Global population growth was 1.6 percent per year during the period.

SOURCE: UNEP (2014a), Kubiszewski et al. (2013)
Insolvent - negative profit in the world’s raw material industries with natural capital costs included

Profit margin (EBIT) before and after natural capital costs, based on top-2 companies in each Morgan Stanley Composite Index category, Percent, 2012

SOURCE: Adapted from: Trucost and TEEB (2013)
Waiting for Kuznets – example commodity plastics

Plastic consumption, Kg per capita

Emerging markets likely to experience strong growth

Developed markets maturing toward lower consumption

GDP per capita, EUR per capita

1 Includes EPS, HDPE, LDPE, LLDPE, PET Resins, PP, PS, and PVC
SOURCE: TBC (Tecnon; Global Insight)
The four pillars of a 21st century industrial economy

**Net-positive norm**
- New norm of net positive impact across manufactured, natural and human capital
- ‘Good’ – not ‘less bad’
- Initially a voluntary norm, over time supported by formal externality pricing in more and more areas

**Abundant clean energy**
- Shift to renewable energy sources (hydro, solar, wind, biomass, …)
- Massive electrification
- New grid-architectures (off-, on-grid)
- Abundant cheap clean energy recognized as a key driver of economic growth

**High-productivity systems**
- Reducing waste in our largest systems recognized as a major source of wealth and improved environmental performance
- Focus on mobility, food, housing, as these three systems represent 70-80 per cent of all resource use
- Cities play major role in all the three largest systems of mobility, food, housing

**A material bank**
- Clear separation between biological and technical materials
  - Biological materials consumed, then returned safely to biosphere
  - Technical materials re-used many times (not consumed)
- Use of virgin finite materials radically lower than today
- Large secondary material industry and market

SOURCE: Systemiq
**Efficient products, inefficient systems - structural waste in the mobility system**

### Car utilisation
- 1.6% looking for parking
- 1% sitting in congestion
- 5% driving

- Typical French car parked 92% of time
- Average European car has 5 seats but carries 1.5 people/trip

### Land utilisation
- Road reaches peak throughput only 5% of time and only 10% covered with cars then
- 50% of most city land dedicated to streets and roads, parking, service stations, driveways, signals, and traffic signs

### Tank-to-wheel energy flow - gasoline
- Energy used to move people
- Inertia vehicle
- Rolling resistance
- Auxilliary power
- Transmission losses

- Engine losses
- Idling

- 86% of fuel never reaches wheels

- 12:1 dead-weight ratio
- Aerodynamics

### Deaths and injuries/year on road
- 30,000 deaths in accidents and 4x as many disabling injuries

- >95% of accidents from human error

Waste, waste, everywhere

Value development of manufactured products, % of GDP, example EU, 2012

- Eco-systems overused a factor 1.6 to produce goods
- Low product utilization during productive life, e.g. ~2 percent for cars and 35-50 percent for offices
- Products only used 9 years on average, or 28 years if including buildings
  - After the first use cycle, only 5 percent of the raw material value is recaptured
  - In Europe, 60 percent of total end-of-use materials are not recycled, composted, or reused

## Cost-reduction potential in the three real life systems

Total annual cash-out costs per household; 2012, EUR improvement potential for 2050

<table>
<thead>
<tr>
<th></th>
<th>Mobility</th>
<th>Food</th>
<th>Built environment</th>
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</thead>
<tbody>
<tr>
<td><strong>Today’s cost</strong></td>
<td>~5,500</td>
<td>~6,600</td>
<td>~9,600</td>
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<td><strong>RE_{generate}</strong></td>
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<td><strong>Share</strong></td>
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<td><strong>Optimise</strong></td>
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<td><strong>Loop</strong></td>
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<td><strong>Virtualise</strong></td>
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<td><strong>Exchange</strong></td>
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<tr>
<td><strong>Remaining cost</strong></td>
<td>60-80%</td>
<td>25-40%</td>
<td>25-35%</td>
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</tbody>
</table>

ReSOLVE – a menu of business actions for a better economy

**Examples**

<table>
<thead>
<tr>
<th>RE&lt;br&gt;<strong>generate</strong></th>
<th>Nespresso, SLM, Savory Institute</th>
<th>P-REX, Iberdrola, Nearly New Car&lt;br&gt;by Mercedes-Benz</th>
</tr>
</thead>
<tbody>
<tr>
<td>Share&lt;br&gt;<strong>generate</strong></td>
<td>Share assets (e.g. cars, rooms, appliances)&lt;br&gt;Reuse/secondhand&lt;br&gt;Prolong life through maintenance, design for durability, upgradability, etc.</td>
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<tr>
<td>Optimise&lt;br&gt;<strong>generate</strong></td>
<td>Increase performance/efficiency of product&lt;br&gt;Remove waste in production and supply chain&lt;br&gt;Leverage big data, automation, remote sensing and steering</td>
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<tr>
<td>Loop&lt;br&gt;<strong>generate</strong></td>
<td>Remanufacture products or components&lt;br&gt;Recycle materials&lt;br&gt;Digest anaerobic&lt;br&gt;Extract biochemicals from organic waste</td>
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<td>Books, music, travel, online shopping, autonomous vehicles etc.</td>
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<td>Exchange&lt;br&gt;<strong>generate</strong></td>
<td>Replace old with advanced non-renewable materials&lt;br&gt;Apply new technologies (e.g. 3D printing)&lt;br&gt;Choose new product/service (e.g. multimodal transport)</td>
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</tbody>
</table>

In search of principles - outline of a circular, regenerative economy system
## The circular economy opportunity – 2030 scenarios

Mobility, food and built environment, societal perspective 2030

### Annual primary resource costs, other cash-out costs and negative externalities

EU-27, 1000 billion EUR

<table>
<thead>
<tr>
<th></th>
<th>Current development scenario</th>
<th>Circular economy scenario</th>
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</thead>
<tbody>
<tr>
<td><strong>Today</strong></td>
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<tr>
<td>Improvements</td>
<td>1.8</td>
<td>1.2</td>
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<tr>
<td>Rebound effect</td>
<td>-0.2</td>
<td>-0.1</td>
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<td>2030</td>
<td>6.3</td>
<td>5.4</td>
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<td>Additional</td>
<td>3.4</td>
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<td>improvements</td>
<td>-0.1</td>
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<td>Rebound effect</td>
<td>1.9</td>
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<td>2030</td>
<td>3.0</td>
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*Rebound effect*:

- Current development scenario: +3.0 (2030)
- Circular economy scenario: -0.2 (2030)

*Additional improvements*:

- Current development scenario: -0.1 (2030)
- Circular economy scenario: -0.2 (2030)

**Note:** The rebound effect is calculated as a percentage decrease in resource costs and externalities from the baseline (Today) to the target year (2030).
Better economic and environmental outcomes
Indexed (2012 = 100)

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Current development scenario</th>
<th>Circular scenario</th>
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<tbody>
<tr>
<td>GDP EU-27, indexed (2012 = 100)</td>
<td>104 111 115 127</td>
<td>90 81 74 59</td>
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<td>Direct user cash out costs EU-27, indexed (2012 = 100)</td>
<td>2030 2050</td>
<td>2030 2050</td>
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<td>CO2 emissions EU-27, indexed (2012 = 100)</td>
<td>69 52 39 17</td>
<td>78 68 59 47</td>
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<td>Primary material consumption EU-27, indexed (2012 = 100)</td>
<td>2030 2050</td>
<td>2030 2050</td>
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Five reasons why

A case for change
- Paris tailwind
- Sixty trillion dollars to lose
- Peak child

An intuition reset
- Precedents
- Catalytic “Tesla“ moments
- Tipping points

Governments new role
- Market makers
- Entrepreneurial state
- Meso-economy

Power of the crowd
- Explosion of expressive power
- New transparency
- Trust revolution

New capitalist
- Embracing new rules
- Re-assessing risk
- Long-term-ism

SOURCE: McKinsey Center for Business and Environment
Systemic change – three TOCs to guide GEF

**Theory of the Case**
“A superior solution”
- An economic (“Decoupling”), social (“SDG’s”) and environmental imperative (“boundaries”)
- A technology disruption (“2nd Machine Age”)
- A portfolio of initiatives: Integrated, focused, driver-based, MEA-aligned, SDG-inspired, results-driven, cross-checked, private-public

**Theory of the Catalyst**
“Self-perpetuating interventions”
- Markets – creating and derisking new markets
- Measures – IWI accounting as a new norm
- Management – the next LEAN

**Theory of Change**
“Agency and leadership”
- International agreements, facilities and mechanisms (CBD, UNCCD, UNFCCC, Minamata, Stockholm, Montreal)
- Regional and national agendas EU Circ. Econ. Action Plan, Finland, China, Sweden, …
- Systems alliances (New Plastic Economy, Trash-free Sea Alliance, Tropical Forest Alliance)
Creating markets - there are precedents (e.g., solar energy system)
ReSOLVE – a menu of resource performance levers addressed in GEF’s portfolio of initiatives

### Impact programs

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<td>Reclaim, retain, and restore health of ecosystems</td>
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<td>Return recovered biological resources to the biosphere</td>
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<td>Leverage big data, automation, remote sensing and steering</td>
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... and those in need of “market making”

<table>
<thead>
<tr>
<th>Impact programs</th>
<th>Land-</th>
<th>Transform-</th>
<th>Food</th>
<th>Sustainable</th>
<th>Environmental</th>
<th>Healthy</th>
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<th>Amazon</th>
<th>Wildlife</th>
<th>Inclusive</th>
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<tbody>
<tr>
<td>SDGs</td>
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<td>Systems</td>
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<td>Cities</td>
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<td>2, 5, 6, 7, 9, 11</td>
<td>12, 13, 15</td>
<td>6, 12, 13, 15</td>
<td>1, 5, 8, 10, 15</td>
<td>All</td>
<td>12, 14</td>
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**REgenerate**
- Shift to renewable energy and materials
- Reclaim, retain, and restore health of ecosystems
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- Share assets (e.g. cars, rooms, appliances)
- Reuse/secondhand
- Prolong life through maintenance, design for durability, upgradability, etc.

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- Increase performance/efficiency of product
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- Books, music, travel, online shopping, autonomous vehicles etc.

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- Choose new product/service (e.g. multimodal transport)

A new set of priorities fit for the 21st century

<table>
<thead>
<tr>
<th>GDP growth</th>
<th>Inclusive Wealth Index growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Labor productivity</td>
<td>Resource productivity</td>
</tr>
<tr>
<td>Projects</td>
<td>Systems</td>
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<tr>
<td>Divergence</td>
<td>Convergent decision making</td>
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<tr>
<td>Products</td>
<td>Performance</td>
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<tr>
<td>Externalize</td>
<td>Take-back/EPR as a norm</td>
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<tr>
<td>Costs</td>
<td>Quality</td>
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<tr>
<td>Product innovation</td>
<td>System innovation</td>
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<tr>
<td>Net negative</td>
<td>Net positive norm</td>
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</tbody>
</table>

SOURCE: Thomas Kuhn, Structure of a Scientific Revolution (1964)