International Synergies Limited

IS Applications in the UK
And the Potential in Iskenderun Bay

22nd September 2011

Ian Humphreys – UK Projects Director
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1. National Industrial Symbiosis Programme (NISP)
Introduction to International Synergies

- International Synergies founded in 2005 to deliver NISP and other (predominantly industrial symbiosis) programmes
- Initially employed 4 people in Birmingham
- Now employs 40 staff including another 25 employed via partners throughout the UK
- First international contract 2006 - USA
- Working across 5 Continents (in Brazil, China, Hungary, Mexico, Romania, Slovakia, South Africa, Turkey, USA)
- ISO14000 and ISO9000 accredited
NISP: The Pathway To A Low Carbon Sustainable Economy

Charts NISP’s progress since becoming the world’s first national industrial symbiosis programme in 2005 and sets out the compelling argument that the business led NISP has the potential to fulfill a key role in the transition towards a low carbon sustainable economy.
NISP (England) delivered Outcomes
April 2005 – March 2011

<table>
<thead>
<tr>
<th>METRICS</th>
<th>In Year Benefits</th>
<th>Lifetime Impact (Max 5 year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Landfill diversion</td>
<td>8 million tonnes</td>
<td>39 million tonnes</td>
</tr>
<tr>
<td>CO\textsubscript{2} reduction</td>
<td>7 million tonnes</td>
<td>35 million tonnes</td>
</tr>
<tr>
<td>Virgin material savings</td>
<td>11 million tonnes</td>
<td>53 million tonnes</td>
</tr>
<tr>
<td>Haz waste eliminated</td>
<td>0.4 million tonnes</td>
<td>2 million tonnes</td>
</tr>
<tr>
<td>Water savings</td>
<td>13 million tonnes</td>
<td>64 million tonnes</td>
</tr>
<tr>
<td>Cost savings</td>
<td>€196 million</td>
<td>€982 million</td>
</tr>
<tr>
<td>Additional sales</td>
<td>€205 million</td>
<td>€1027 million</td>
</tr>
<tr>
<td>Jobs</td>
<td>10,000+</td>
<td>??</td>
</tr>
<tr>
<td>Private investment</td>
<td>€337 million</td>
<td>??</td>
</tr>
</tbody>
</table>

Rate Euro €1 = 2.45 TL
€35 million investment since 2005

International Synergies
Industrial Ecology Solutions
Excellent Return on Investment (April 2005- March 2011)

<table>
<thead>
<tr>
<th>For every €100 invested by UK Government</th>
<th>Yearly Return</th>
</tr>
</thead>
<tbody>
<tr>
<td>New income generated for industry</td>
<td>€5,000</td>
</tr>
<tr>
<td>Cost savings by UK industry</td>
<td>€3,400</td>
</tr>
<tr>
<td>Virgin material saved</td>
<td>210 tonnes</td>
</tr>
<tr>
<td>Water saved</td>
<td>250 tonnes</td>
</tr>
<tr>
<td>CO₂ reduced</td>
<td>140 tonnes</td>
</tr>
<tr>
<td>Waste diverted from landfill</td>
<td>160 tonnes</td>
</tr>
<tr>
<td>Hazardous waste eliminated</td>
<td>8 tonnes</td>
</tr>
</tbody>
</table>

Rate Euro €1 = 2.45 TL

These results have been subjected to repeated independent validation. UK Treasury receives €16 for every €1 invested
NISP UK has circa 14,000 Members

**Corporates**
- Balfour Beatty
- Veolia
- Denso Manufacturing Ltd
- RICOH UK Products Ltd
- Johnson Matthey
- Anglian Water Services Ltd
- UK Coal Plc
- Jaguar Land Rover
- SITA
- Diageo
- BAE Systems
- Peel Group
- Foster Yeoman
- Bombardier
- Michelin
- Corus
- HSBC
- Toyota

**SMEs**
- JBR Recovery
- G&P Batteries
- John Pointon & Sons Ltd
- Renewable Energy Growers
- Firth Rixson Castings
- Giffords
- Arden Wood Shavings
- Alutrade
- Kingpin
- Coldwater Seafoods
- New Earth Solutions
- Teknor Apex
- Befesa Salt Slags
- MJ Allen
- Green Tech Ltd
- GPD Developments
- County Mulch
- Lower Reule Bio Energy
- Westland Horticulture
- H Sivyer
- Recycled UK
- LC Energy
- Works infrastructure Ltd
- Farrow & Ball
- Coldwater Seafood Ltd
- Delkia Bio-energy
- Howarth Timber Engineering
- McGrath Barr
- Montracon
- Guala Closures Ltd
- Bio Waste Solutions
- Ramfoam Ltd
- BIP Oldbury
- Glendale Grounds Maintenance
- Jack Moody Holdings

**Micros**
- TVLI
- Manufacturing Production Solutions
- Arrow Environmental
- Dinano
- Akron
- Kito Engineering Solutions
- Facility Water Management
- Enviro (Grimsby)
- Clarkson Enterprises
- Analytichem
- Angelheart Inc
- John Carson Innovations
- Advantage Waste Solution
- Ross Miller Farm

**KEY POINTS**
- All sizes - Multi-nationals, SMEs, Micros, Entrepreneurs
- All sectors
- All resources
- SMEs represent 95% of membership
Agriculture, hunting & forestry; 6.79%
Fishing; 0.15%
Mining & Quarrying; 1.18%
Manufacturing; 27.49%
Electricity, gas & water supply; 0.91%
Construction; 6.89%
Wholesale & retail trade; repair of motor vehicles, motorcycles & personal & household goods; 8.37%
Hotels & restaurants; 0.81%
Transport, storage & communication; 1.83%
Real estate, renting & business activities; 14.87%
Education; 1.35%
Health & social work; 1.65%
Public administration & defence; compulsory social security; 2.43%
Financial intermediation; 0.87%
Other community, social & personal service activities; 5.61%
Extra-territorial Organisation & Bodies; 0.08%
Private household employing staff undifferentiated production activities of households for own use; 0.17%
Unknown; 18.55%
Real estate, renting & business activities; 14.87%
Manufacturing; 27.49%
Construction; 6.89%
Wholesale & retail trade; repair of motor vehicles, motorcycles & personal & household goods; 8.37%
Hotels & restaurants; 0.81%
Transport, storage & communication; 1.83%
Unknown; 18.55%
3. Policy Context
How IS has an impact on Policy

- DG Environment – Roadmap for a Resource Efficient Europe (Sept 2011) recommends that industrial symbiosis becomes widespread across Europe

- DG Enterprise and Industry “Sustainable Industry: Going for Growth and Resource Efficiency Strategy” (August 2011) industrial symbiosis is a recommended policy instrument

- COWI report gives the underpinning evidence to the above strategies
A report commissioned by DG Environment and scheduled to come out in the next few weeks provides an economic analysis of resource efficiency policies and has given International Synergies’ National Industrial Symbiosis Programme (NISP) the maximum possible score based on economic and environmental benefits amongst 120 policies from 23 countries.

The report presents compelling evidence to support European-wide replication of NISP stating, ‘NISP shows high potential for improving resource efficiency, and the programme could be successfully replicated in every EU Member State.’ It further states that an EU wide network has the potential to be more successful than the English network has been to date and concludes that replicating the NISP programme approach across Europe would result in huge environmental and economic gains.
OECD Identifies IS as Critical to Growth Agenda

OECD has recently declared industrial symbiosis ‘eg. NISP’ to be “an excellent example of systemic innovation vital for future green growth”
UK Policy Initiatives – Driving IS Activity

- Landfill Tax
  - €64/tonne for Non Hazardous Waste + Gate Fee
  - Typical Hazardous Waste disposal cost €150+/tonne
- Waste Exemption Legislation
  - Make resource transactions more simplistic for participating industry
- End of Waste Criteria
  - Work closely with industry and regulator in UK
  - Addresses ‘when does waste become a product’
- Carbon Accounting and IS activity
  - Carbon Reduction Commitment
- Open access to Regulatory Data for IS Activity
5. Case Studies
From Salt to the Earth - Befesa

- Links to foundries via Cast Metal Federation
- Identified ways to reuse spent foundry sand
- Sustainable solution to landfill
- Valuable business diversification for Befesa (Whitchurch)
- Additional Sales - €230k
- Landfill Diversion – 10,000 te
- CO2 savings – 1,020 te
- Cost Savings - €350k
- Virgin Materials – 10,000 te
- Jobs Safeguarded - 10
A Fruitful Collaboration

Companies:
• Terra Nitrogen (UK) Ltd
• John Baarda Ltd

Summary:
• Ways of using ‘wastes’ from manufacturing plant to grow tomatoes all year round.

Achievements:
• 65 new jobs.
• CO$_2$ reduced by 12,500 tonnes p.a.
• Successful re-use of waste heat.
• €17 million private investment in region.
Guided Busway Never Tyres of Being Green

- BAM Nuthall contracted to provide Cambridge Guided Busway
- Required 40,000 m³ of infill material.
- 3,000t of crushed concrete already procured
- NISP facilitated use of tyre shred as alternative material.
  - 1.8M tyres used on project
- Virgin Materials Saved – 60,000t
- CO₂ Savings – 6,120 t
- Water Saved – 1,440 t
Bristol Port Initiative

- Over 60 companies actively involved
- Quarterly meetings to share best practice
- Champions Group to lead and guide the Initiative
- 38 completed synergies

Results to date –
- Landfill diversion – 37,417 tonnes
- CO$_2$ savings – 10,424 tonnes
- Cost savings – €329,500
4. Testimonials & Industrial Support
Welcome to Michelin

Paul Kinkead
Environment Manager
Reduction in waste to landfill

- Corporate target to eliminate process waste to landfill
- Challenge: difficult materials to recycle
- 36 individual waste streams
- Use of benchmarking within Michelin
- Breakthrough: engagement with NISP to source creative and cost effective solutions
- Access of expert solution providers
Reduction in waste to landfill

- 97% reduction achieved
- Ballymena factory is the corporate benchmark
- Corporate targets achieved 18 months ahead of plan

![Bar chart showing reduction in waste to landfill](image)
Feedback from Mark Bradford, Production Systems Manager, Toyota -

“In my view, the initiative has offered a pool of expertise and service providers that would have otherwise gone unnoticed by us. I heartily recommend all businesses to join, explore the possibilities and realise the benefits for themselves.”

His Royal Highness The Prince of Wales

“We will only meet the challenge of catastrophic climate change by working in partnership and I would like to thank NISP for all that you do to foster these relationships”
6. Potential for Iskenderun Bay
Potential for Iskenderun Bay

- Similar project has already delivered wide ranging economic & environmental benefits for UK business
  - Bristol Port Initiative
- An Initial Study has been undertaken by TTGV:
  - Resource data taken from initial business engagement and workshops in phase I
  - Supplemented with investigation of company websites
  - Involves an initial 23 companies located in and around Adana
  - Analysis of similar materials and their use by UK business
    - Use of UK Industrial Symbiosis Database
    - Identification of applicable Case Study material
  - Initial findings are VERY encouraging
Potential for Iskenderun Bay

- Participating companies have provided information on confidential resource forms.
  - Data from site visits and returned forms has proved crucial in identifying initial opportunities.
  - Those companies that have sent information are being worked upon with priority.
  - Synergies are being identified between those companies that have provided information
    - Using resource information provided and knowledge of business inputs and outputs
  - UK IS system is being used to support TTGV activity
    - Identify where resources have been used by UK business
    - Identify where resources needed have been sourced by UK business
    - Identify similar industry in the Iskenderun Bay region
Potential for Iskenderun Bay
Potential for Iskenderun Bay

• Initial Analysis of Resource Data has shown:
  – Potential identified for around 40 initial synergies or matches
  – Involving both waste material, by-product and energy transfers
  – Examples identified have also been successful in UK and include:
    • Organic wastes to Fertilizer Production
    • Food & Drink wastes to Agricultural Applications
    • Waste heat from textile company to nearby business
    • Chemicals from Pharmaceutical Company to Agricultural Processor
    • Nappy waste to Energy from Waste (Cement Manufacture)
    • Plastic waste to PET bottle manufacture
    • Plant fibres & Starch manufacture wastes to Paper & Pulp Manufacture
    • Shell fish wastes to Pharmaceutical sector
  – Potential for many more
Potential for Iskenderun Bay

• Benefits realised for similar UK projects
  – Brewing waste to agricultural uses (Land spreading & animal feed)
    • 2,600 tonnes of landfill diversion
    • €169,000/yr costs savings
  – Shell fish waste to Cement Industry (Waste to Energy)
    • 260 tonnes/yr of landfill diversion
    • €25,000/yr cost savings
  – Chemical Wastes to Agricultural Sector (Fertiliser Production)
    • 78 tonnes of Hazardous Waste eliminated
    • €7,200/yr Additional Sales
  – Plastic Packaging Wastes > Plastic Re-processor > Plastic Bottle Producer
    • 570 tonnes of landfill diversion & €67,000 costs savings
Potential for this Iskenderun Bay

• Synergy Workshops
  – UK has shown potential for 300 to 500 matches per workshop
  – Historically about 20% come to fruition
• TTGV team can tap into UK learning as resource & identify match potential
  – Data analysis of resources UK vs Turkey
  – Case Study Library
• Quality of data supplied by Industry is critical
  – Classification, volumes, location
• Continued quality engagement with Industry and identifying Industry champions
  – As regional network grows, so will the opportunities identified
Thank you for listening
Thank you BTC and TTGV

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