Advancing a Circular Economy in Canada: NISP® Canada Pilot Results

Metro Vancouver Agricultural Advisory Committee
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What is Industrial Symbiosis?

Systems approach to a more sustainable and integrated industrial economy that identifies business opportunities for one business or sector to take underutilized resources (wastes / by-products, energy, water, assets, expertise) from another to improve resource utilization and productivity.

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NEW European ‘pre-standard’ for industrial symbiosis programs mandated in each member country
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Industrial Symbiosis Supports Circular Economy

Industrial Symbiosis supports 2 key CE business models:

1. Waste as Resource
2. Returning By-products

"Circular Advantage Innovative Business Models and Technologies to Create Value in a World without Limits to Growth"; Accenture, 2015
NISP IS THE BEST GLOBAL MODEL FOR ACHIEVING INDUSTRIAL SYMBIOSIS
NISP® Canada 20-Month Pilot

Structure:
- Metro Vancouver & Greater Edmonton
- 2 FTE Facilitators (each region)
- 6 Workshops (each region)

Funding:
- $1M from 4 levels of government
- Metro Vancouver leverage 9:1)
**Metro Vancouver Sustainability Innovation Fund (SIF)**

NISP® Canada

- Supports goals in the *Integrated Solid Waste and Resource Management Plan*
- Transitioning to a low carbon, circular economy expected to be a cross-cutting theme in new Solid Waste and *Climate 2050* strategies
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- > 350 participants
- > 1,900 specific Resources discussed
- ~ 3,500 resource matches – “synergies”
- > 160 synergies progressing / progressed
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Metro Vancouver

54 Ag-Value Chain Participants
34 Ag-Value Chain Wastes, e.g.,

- Biomass - algae derived
- biomass - spent mushroom compost
- Cannabis Waste
- Chocolate – off-spec chips
- Cocoa powder- Not well processed
- Dried Grains for biofuel and animal feed
- Flat beans (Cocoa)
- Food company process and food waste
- Off-spec blueberries
- Fish skin

- Algae Spirulina Superfood
- Caramel waste
- Chocolate scrap
- Composted soil
- Hemp Fiber
- Meat and seafood reject loads
- Post Grow Soil - Nutrient Rich
- Used coconut oil
- Pine husks
- Pine Pollen (not food grade)
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Industrial Symbiosis Fuels the Bioeconomy

37% of all symbiosis opportunities involved the ag-value chain
Industrial symbiosis:
- Facilitates cross-sector relationships (bio + other)
- Increases access to clean technology
- Fosters new product development
- Reduces costs, increases sales → boost sector competitiveness
- Supports better waste and carbon management
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much, much more ‘in the pipeline’

253,800 t waste diverted from landfill
2,600 t Metro Vancouver

23,800 t CO$_{2e}$ emissions avoided
12,800 t Metro Vancouver

$6.3$ M in savings + cost reductions
$410,000$ Metro Vancouver
NISP® Canada Results

Facilitation helped to:

• Identify more resources & matches
• Find X-sector, X-workshop and new opportunities
• Support busy SMEs
• Increase implementation
• Increase business engagement
• Ensure reportable outcomes
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Barriers to Implementing Symbiosis

• Time! Canadian businesses are really busy…
  • Fewer workshops to focus on synergy implementation
  • Longer lag to symbiosis completion

• Not really regulations (except uncertainty in new industries like microalgae, cannabis)

• Some technical (but led to RD&D potential)

• Just because it’s hauled away doesn’t mean it’s not waste

• Data quality control is important
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Funding is the biggest challenge.

- Model addresses market failures
- Proven regional econ- and eco-benefits but individual benefits are unique
- Main cost is people: professional, knowledgeable facilitators and support
- Government investment supports programs globally → future? green bonds, etc.
NISP® Canada Status

- Lower Columbia NISP® & CE Study
- Washington Industrial Symbiosis Program Plan
- VEC-Partnered Workshop, Vancouver
- CWMA-Partnered Workshop, Victoria
- City of Calgary seed funding
- City of Edmonton seed funding
“Overall industrial symbiosis is expected to grow significantly. Moving towards a low carbon resource efficient industry and society implies that more industrial symbiosis solutions will be required and implemented”

* Call for Tender: European Network of Businesses and SMEs for Industrial Symbiosis, 2019