NISP® Canada:
Waste Re-Purposing for Triple Bottom Line Benefits

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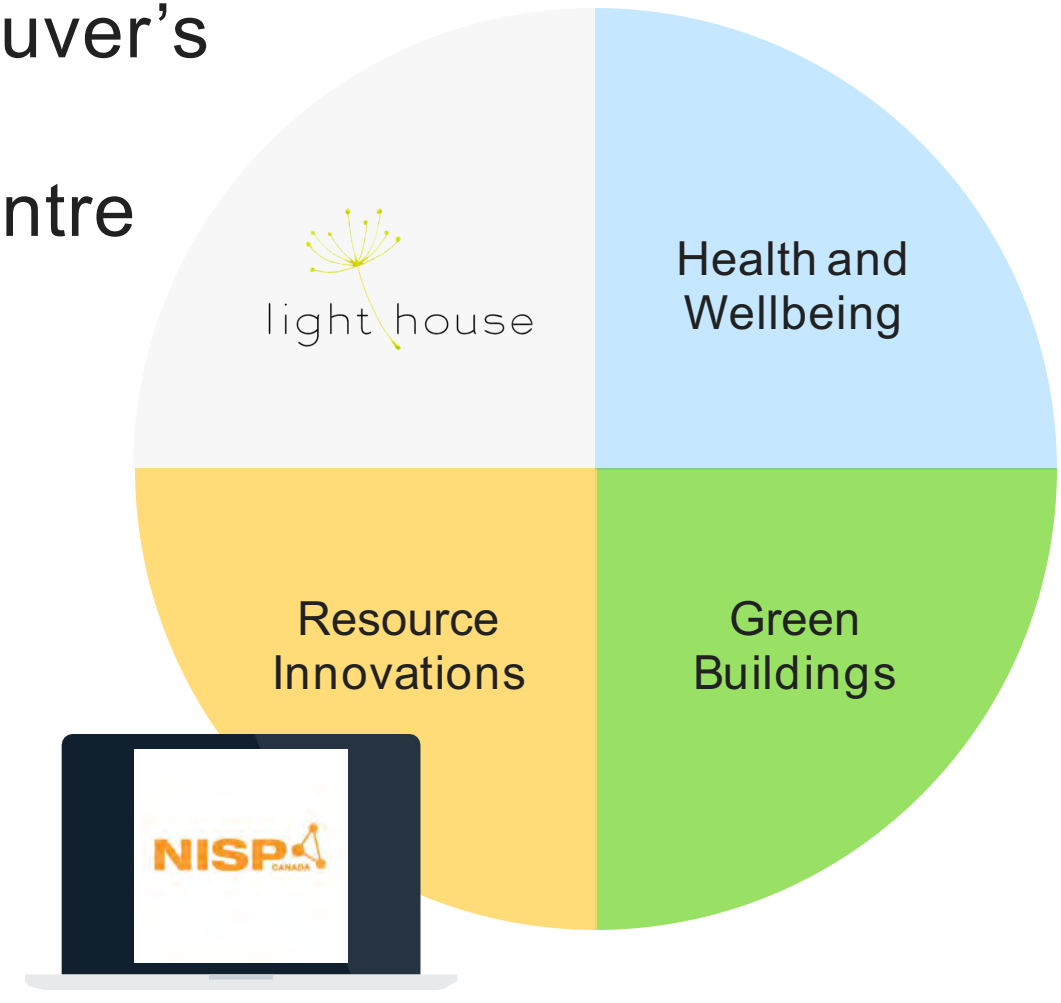
Presentation Overview

- ✓ Industrial Symbiosis and NISP® defined
- ✓ Some industrial symbiosis examples
- ✓ The NISP® Canada Pilot: Vancouver & Edmonton Regions

NISP® is a key driver of the circular economy

NISP® Canada

a program run by Vancouver's non-profit Light House Sustainable Building Centre



What is Industrial Symbiosis?

- **Mutually beneficial** business relationships to utilize 'waste' resources

- Waste-to-input linkages are common, but other physical or operations-based resource collaborations are also possible - e.g., shared lab space, research facilities, utilities, warehousing, transport, etc.

Industrial Symbiosis moves resources up the waste hierarchy

Industrial Symbiosis moves resources up the waste hierarchy

The higher the level, the greater the cost savings, the greater the value to the economy

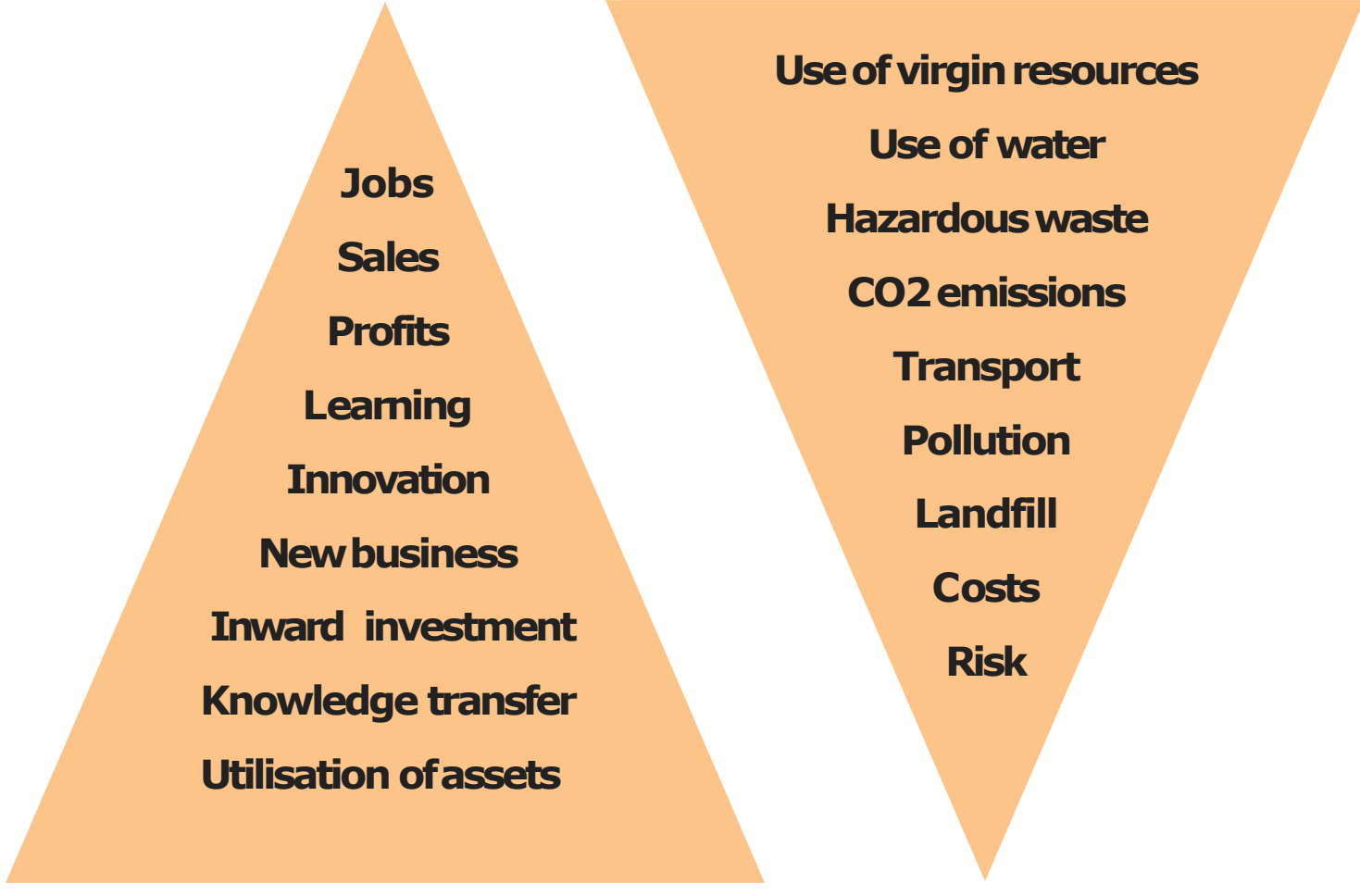
NISP® CANADA

International Synergies
industrial ecology solutions

NISP IS THE BEST GLOBAL MODEL FOR ACHIEVING INDUSTRIAL SYMBIOSIS

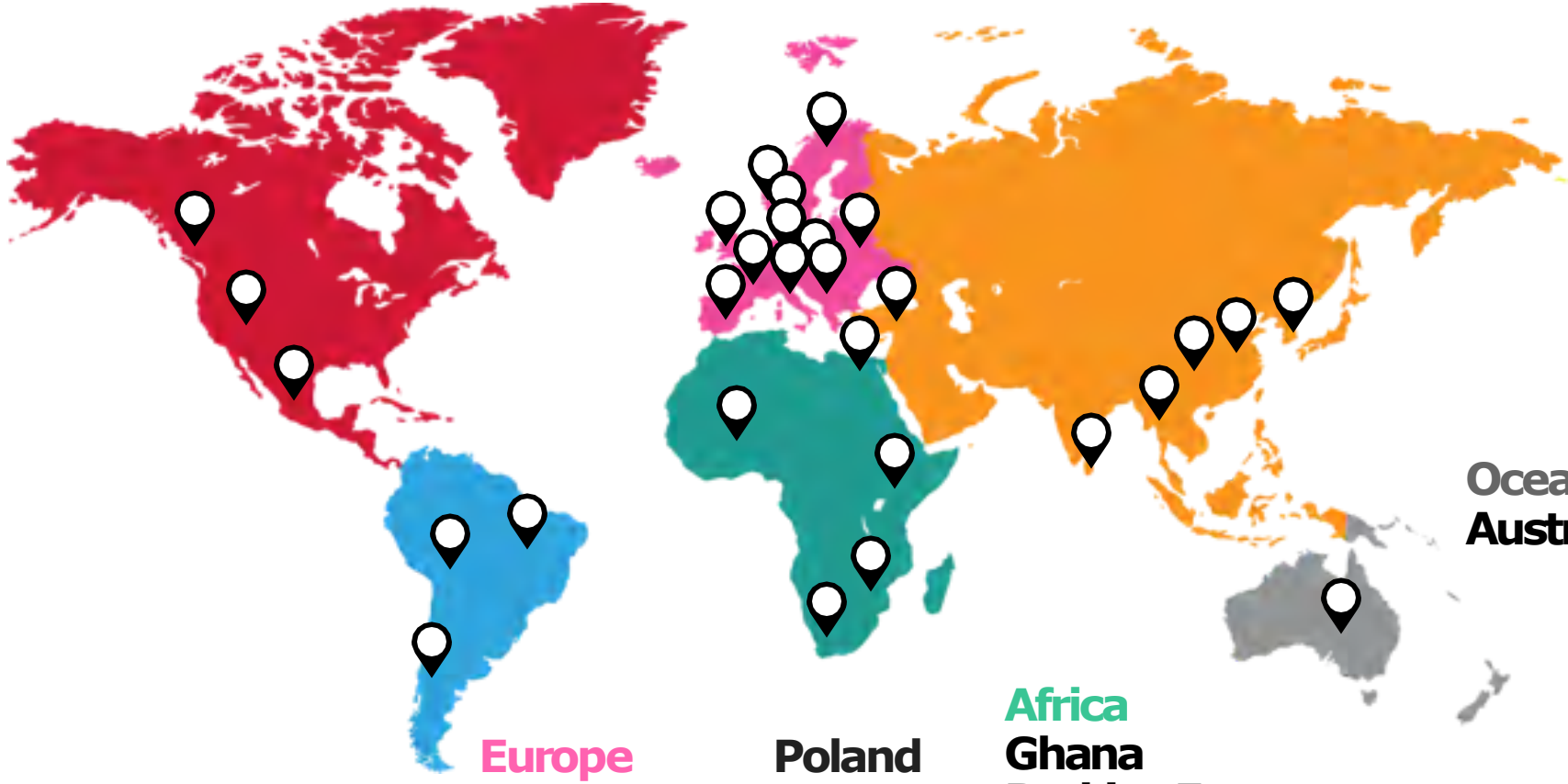
OECD EU G7 GERMANY 3GF WWF

What NISP® achieves ...



Real business benefits + government policy objectives

Global experience – Canada number 31



N. America
USA
Canada
Mexico

S. America
Brazil
Peru
Chile

Europe
UK
Denmark
France
Germany
Finland
Netherlands
Poland
Slovakia
Belgium
Romania
Hungary
Italy
Spain

Africa
Ghana
Burkina Faso
Mauritius
Kenya
Uganda
South Africa
Egypt

Asia
South Korea
China
Sri Lanka
Turkey

Oceana
Australia

The 6 Steps of the NISP® Process

Build a network of prospects

1

Resource-matching workshop(s)

2

NISP practitioners facilitate all stages of a synergy

3

Workshop data entry, post-workshop analysis

4

The numbers of contacts & resources increase with time

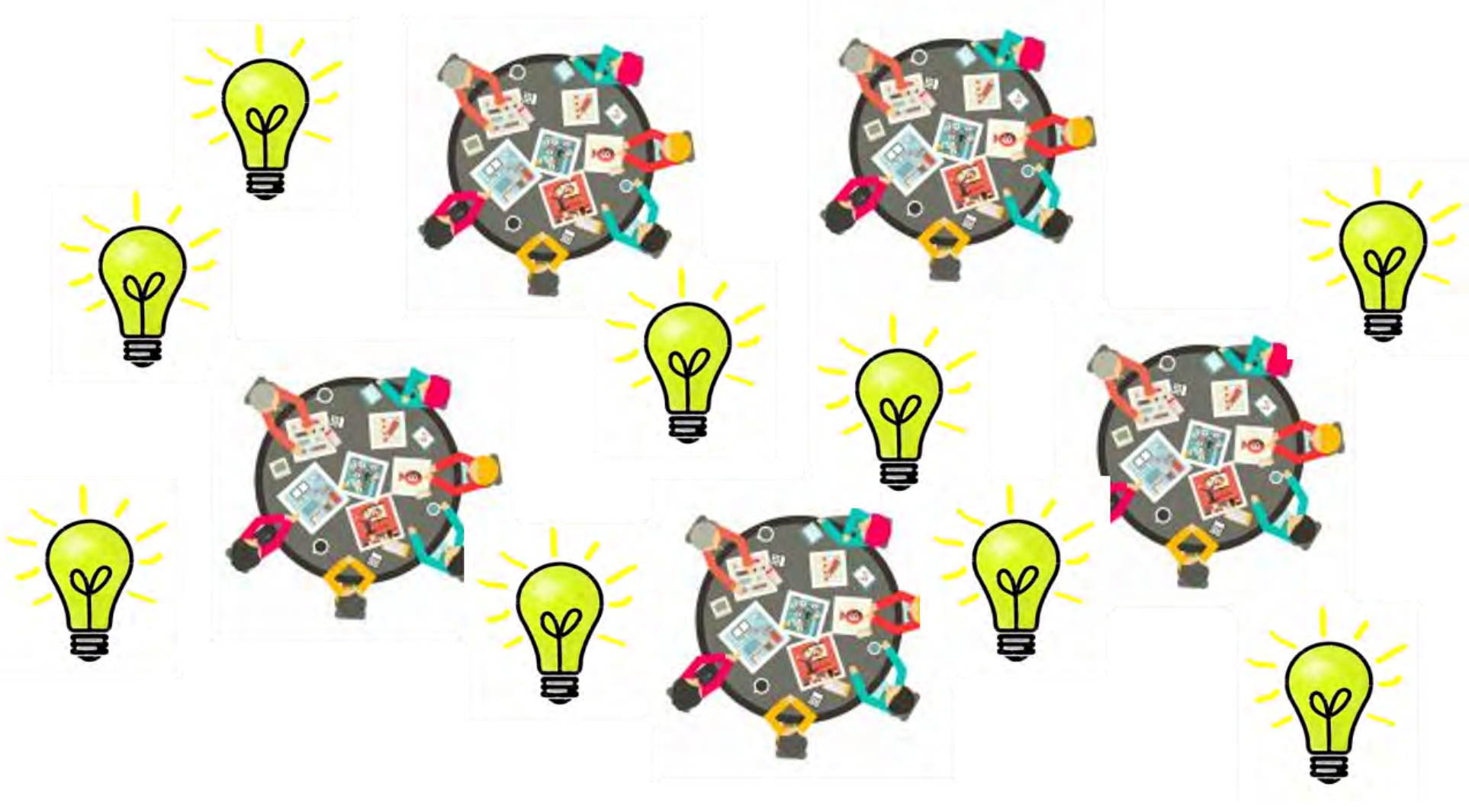
5

Parties work to make potential synergies viable

6

Business deal(s) completed

What Happens at a NISP® Workshop?



How it works…

Really simple principle: making matches…

What do you **HAVE**?

Unwanted resources

+

What do you **WANT**?

Resources you can use / process

=

MATCHES are made

- Participants describe the resource they "**HAVE**" or "**WANT**" on the standardized slips provided
- The slips are circulated round each table over the course of the workshop, and **"matches"** are made

Your Resources - I HAVE... and/or I WANT... such things as:

- **Materials** – wood, plastics, food waste, waste electronics, metal scrap
- **Expertise** – ISO 9000 (quality mgmt), ISO 14000 (env'l mgmt.), OSHAS 18001 (H&S), best practice
- **Capacity** – under-utilised equipment, laboratory and testing facilities
- **Logistics** – transport, warehouse facilities, land
- **Water and Energy** – waste heat, borehole water, process water

Workshop Outcomes

- Summary report within 2-3 business days:
  - Number and identities of participants present
  - Number of resources identified
  - Number of potential synergies

- **Each** participant receives:
  - 1 pg. summary of workshop highlights
  - Contact info. for all attendees
  - A summary of all “Haves” and “Wants” tailored to the information provided by the participants
    - Summary shows who is interested in or has the particular resource(s) identified by the workshop participant

Workshop– Follow-ups

Follow-up is critical to advance ideas to implementation

NISP® practitioners work with businesses to turn possible synergies into new, real business partnerships.

- Visit sites to augment workshop data
- Facilitate business-to-business relationships
- Provide support to access technical expertise or funding

Implementation requires a **mutually beneficial business case**.

Follow-up is **at no cost to businesses** (key for success).

Industrial Symbiosis Examples

The following are a few of the many successes achieved through the application of NISP® principles.

Most are from the UK, where NISP was created by International Synergies Limited, and where NISP was rigorously audited.

Working the network for existing solutions

- **Problem:** Want to achieve zero waste to landfill by 2015
  Problematic waste – plastics contaminated with syrup.

- **Solution:** a specialist recycler able to collect and recycle the materials

- **Results:**
  - Reduction in costs: £14,675 per year
  - Reduction in CO_2: 1.533 tonnes
  - Reduction in waste: 120 tonnes
  - Reduction in virgin material use: 1120 tonnes

"NISP very quickly identified a company who could take, and recycle, a growing and problematic plastic waste stream of ours. This has greatly reduced our landfill costs and helped us on our way to sending zero waste to landfill."

Andrew Walkden - A G Barr (Environment Officer)

Collaboration with the regulator

Problem:
Foundry sand, containing phenol, disposed in landfill; nolonger allowed.

Solution:
Identified ways to use the spent foundry sand in the production of bricks.

Results:

- Cost reduction: £300,000 per year
- Additional sales: £200,000
- Landfill diversion: 10 000 tonnes per year
- Reduction in virgin material use: 10,000 tonne/yr
- Jobs saved: 42

BEFESA

New policies create new opportunities

- **Problem:** A new policy in China banning the disposal of sewage sludge to landfill.

- **Solution:** A professional sludge treatment company, whose core technology is extracting protein from sludge for the manufacturing of protein products.

- **Results:**
  - Cost reduction:464 000 Yuan per year
  - Reduction in CO_2: 1.533 tonnes
  - Additional sales: 70,000 Yuan per year
  - Reduction in landfill: 180 tonnes per year
  - Reduction in virgin material use: 180 tonnes per year

More than just materials

Problem: Industry producing wastes: 12,500 tonnes of CO_2 released in to the atmosphere, and hot steam.
Tomato producer: additional production capacity limited due to high energy costs.

Solution: Construction of a greenhouse capable of producing 300,000 tonnes per year of tomatoes.

Results:

- Elimination of CO_2 emissions
- Investment: £18 million
- Creation of 65 new jobs
- Recovery of heat from steam

Eco-innovation in process

Problem: Change to X-ray films made existing process for metal recovery ineffective.

Solution: Engage with University innovation providers to change the process.

Results:

- Reduction of CO_2: 24,000 tonnes per year
- Eco-Innovation and Green Growth
- Regional Economic Development (11 jobs).

Innovation in materials

Problem: Hazardous dust from production of air conditioning units needed an alternative solution to landfill

Solution: The dust was reprocessed and used by Mil-Ver metals in their manufacturing process

Results:

- Reduction in costs: 45,000 € per year
- Hazardous waste eliminated: 15 tonnes per year
- Reduction in CO_2: 242 tonnes per year

Eco-innovation in business models

From dirty industry to clean energy company

- Animal renderer
- Initial NISP engagement: by-products diverted from landfill to cement industry
- Second stage: improve efficiency of processes
- Third stage: move into bio-fuels
- Fourth stage: anaerobic digestion and grid connection
- Result: new vision as energy company (same inputs!)

NISP® Canada - 18 Month Pilot

October 2017 – March 2019

Regions:
BC Lower Mainland
AB Greater Edmonton

Practitioners per region

Workshops Per Region

NISP Canada - Funders and Supporters

Funders:

Western Economic Diversification Canada

British Columbia

BC Innovation Council

metro vancouver

Edmonton

City of Surrey — the future lives here.

New Westminster

Supporters:

International Synergies — industrial ecology solutions

light house

BC Alliance for Manufacturing

City of Vancouver

one earth

bio alberta — Association for Life Sciences Industry

City of Port Coquitlam

University of Victoria

Delphi Group — Environmental Strategies. Business Solutions.

Alberta Agriculture and Forestry

Kaizen™ Institute

NISP® Progress To-Date

- **4 of planned 6 workshops held so far in each region**

Vancouver	Edmonton
90 participants	100 participants
500 resources	500 resources
750 potential synergies	800 potential synergies

- **Follow-up to advance synergies is ongoing**

Some Preliminary Results

- Water treatment expertise (Vancouver) being investigated by refinery (Edmonton) to solve water contamination
- Prototype heat recovery technology to be installed at an Edmonton refinery
- Waste textiles being sought by BC-based clothing manufacturer may be provided by workshop attendees
- Shared trucking/warehousing arrangements being investigated
- Wood pallet refurbisher located several new sources of used, broken pallets in Greater Edmonton
- Biomass inventory developed in both provinces
  - *More renewable fuels, biogas, etc. being developed*
- BCIT's new wood-fired district heating facility found free fuel, including movie set carpentry waste

Concluding Remarks

- NISP® proven approaches to deliver multiple benefits:
  - Job creation, waste repurposing, GHG reduction, innovation, reduced air and water emissions, job retention
- Over 1100 potential synergies so far in Vancouver and Edmonton
- Detailed results pending, but some early successes
- The push is on to expand the pilot to other regions; e.g., Calgary, BC Interior, Vancouver Island
- www.nispcanada.ca for more information, details on upcoming workshops (Sept. 26, Devon the next AB event)