



# Process Integration: *a powerful tool for energy-efficient industrial processes*

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CanmetENERGY

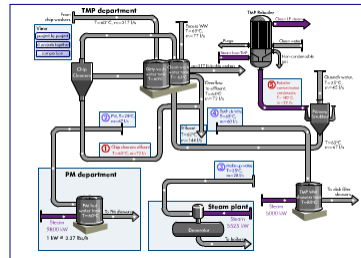
Natural Resources Canada

Website: [www.canmetenergy-canmetenergie.nrcan-rncan.gc.ca](http://www.canmetenergy-canmetenergie.nrcan-rncan.gc.ca)



## Process Integration in Canada: *Context*

- **Process Integration** is a site-wide approach that analyses energy flows to identify and correct inefficiencies in **complex industrial processes**
- Looks at the **global** process, and the **interactions** between its different parts rather than solely considering individual operations
- By using a global analysis of the entire process, determines where heat should be recovered and where it should be utilized
- Canadian businesses can benefit tremendously from Process Integration: **10 to 35% energy and water savings are possible cost-effectively**



## Who can Benefit from PI?



- Industrial facilities suitable for PI
  - Operate complex energy systems involving several of the following aspects
    - Various heating and cooling demands
    - Many process heat exchangers (*i.e. in addition to HVAC system*)
    - Large steam usage (*direct injection or using HXs*)
    - Refrigeration for cooling or freezing
    - Energy intensive equipment (*e.g. dryers, evaporators, furnaces, kilns, reactors, distillation columns*)
    - Large hot water usage
  - Use significant amount of **thermal energy**
    - Thermal energy usage > 100,000 GJ/yr or  
~ \$1 million/year

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## What Process Integration Studies Deliver

- PI studies deliver a comprehensive set of feasible and cost-effective measures to save energy
  - **Best practices and operational changes**
  - **Heat recovery from and within utility systems**
    - Boilers, refrigeration and air compressors
  - **Process heat recovery**
    - Between process hot and cold streams
    - Through the steam system (*i.e. steam generation*)
  - **Potential for cogeneration and heat pumping**
- Presented in an investment strategy roadmap



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## NRCan's Support to Process Integration

- Natural Resources Canada encourages the adoption of Process integration as a good practice to:
  - Improve energy efficiency
  - Reduce emissions
  - Cut operating costs and improve productivity
- NRCan's portfolio in support to Process Integration

*Coming soon*

Information

Incentives

Tools

Training

**Encouraging the adoption of  
PI in Canadian industries**

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## NRCan's Support to Process Integration: *Information*

**Make PI information  
available to industry**

- Information package on Process Integration
  - A Pinch guide and several examples
  - Success stories
  - PI benefits for several sectors
  - Website
- Want to know more on PI and if it can be applied at your plant?
  - Contact our PI experts at CanmetENERGY
  - A visit of your facility can be organized



- CanmetENERGY Website: [www.canmetenergy-canmetenergie.nrcan-mcan.gc.ca](http://www.canmetenergy-canmetenergie.nrcan-mcan.gc.ca)

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## NRCan's Support to Process Integration: *Incentive*

- ecoENERGY Assessment Incentive for Industry: March 31<sup>st</sup>, 2011
  - Based on first come first served
  - Funding of **up to 50%** of the cost of a PI study to a **maximum of \$50,000**
  - Compatible with other funding source (*provincial, utility companies*)
  - **Administrated by OEE**: contact is CIPEC Industry Officer for your sector
  - Support to industry preparing RFP and identifying contractor
  - Support to engineering firms preparing PI technical proposal

Help industry access PI services



40 PI studies completed  
Identified savings: \$102 million/yr  
GHG reduction: 465,000 tonnes/yr



<http://oee.nrcan.gc.ca/industrial/financial-assistance/assessment.cfm>



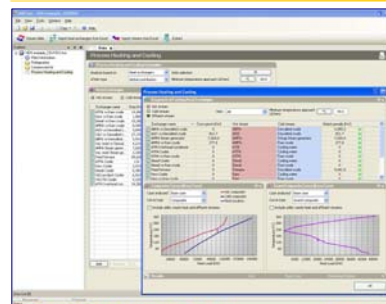
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## NRCan's Support to Process Integration: *Tools and Training*

- Develop Process Integration tools
  - **Goal - Facilitate PI studies and support decision making**
  - Help identify, develop and evaluate heat recovery and operational opportunities using PI principals
  - Focus on utility systems (*steam, refrigeration, compression*) and process heat usage
  - Unique heat recovery capabilities
  - Engineering tools to support calculation
- Will be available to PI training course participants

Build Canadian capacity in the area of PI



Coming soon

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## NRCan's Support to Process Integration: *Tools and Training*

**Build Canadian capacity  
in the area of PI**

- Training in Process Integration
  - **Goal - Train Canadian consultants and engineering firms in the area of PI**
  - Build the capacity to conduct PI studies
  - Understand energy systems
  - Learn PI concepts
  - How to use the PI software tools to identify improvement projects
  - Post-training technical support for software-related aspects
  - Post-training technical assistance to attendees when performing their first PI studies
- First training sessions offered in Quebec in 2010 (AEE), and in other provinces later



Agence de l'efficacité  
énergétique  
**Québec**

**Coming soon**

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## Summary and Conclusions

- **Process Integration** is a powerful approach that can be used in Canadian industries for major energy efficiency gains of 10 to 35%
- Natural Resources Canada is supporting the use of Process Integration
  - Information
  - Incentives
  - Tools (**coming soon**)
  - Training (**coming soon**)
  - Technical support
- **Our goal** - Make PI a standard practice in industrial energy efficiency

**Great opportunities for PI in Canada!**

Think Globally, Act Locally!

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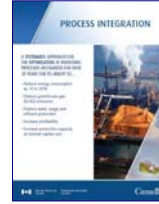


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Thank you very much for your kind attention!



## Questions or comments?

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