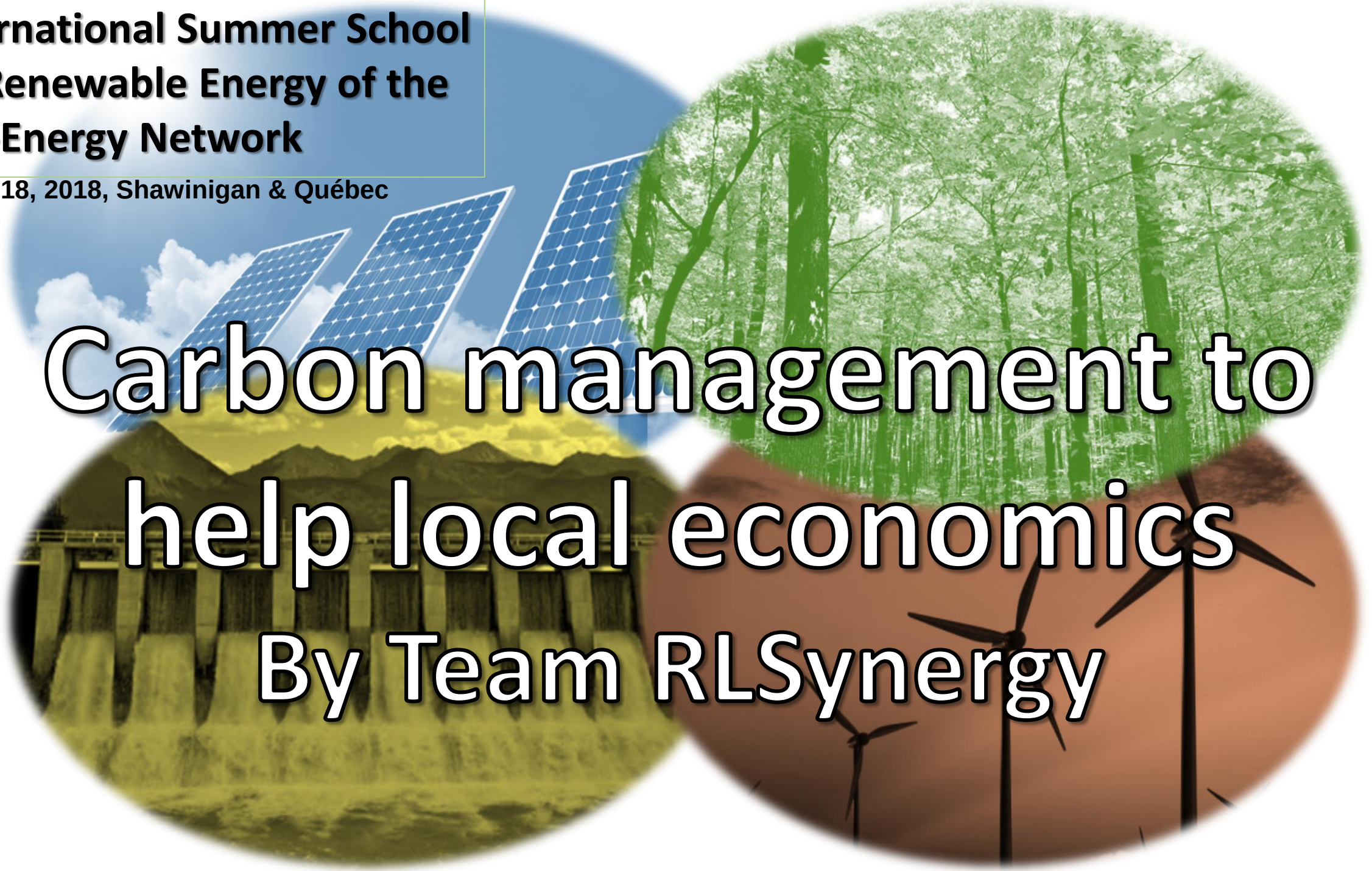
International Summer School on Renewable Energy of the RLS-Energy Network

May 9-18, 2018, Shawinigan & Québec



Carbon management to help local economics

By Team RLSynergy

Context

An abundant source of energy should clearly be kept in mind.

Large-scale power plants lose an average of 60 percent of the energy as waste heat dissipated into the atmosphere ! [1]

Location

- Gaspé-Ile-
- Cement pl
  to improve
  GHG and f
- Socio-ecor

Capter le carbone de Ciment McInnis pour faire du développement

Par **Richard O'Leary** - 15 mai 2018

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La cimenterie de Port-Daniel. Photo : Archives

Mardi à l'émission O'Leary vous informe, nous avons expliqué comment le gaz carbonique qui s'échappe de la cimenterie de Port-Daniel pourrait être valorisé et devenir un levier de développement économique régional.

Entrevue avec Jean-Philippe Chartrand le coordonnateur du comité de maximisation économique de Port-Daniel-Gascon sur le colloque Défi Carbone qui se déroule cette semaine:

Methanol Unit

Regional user

Methanol

To attract new business on the territory

Chemicals

Carbon Capture and Utilization (CCU) [3]

Syngas

Municipal biowaste

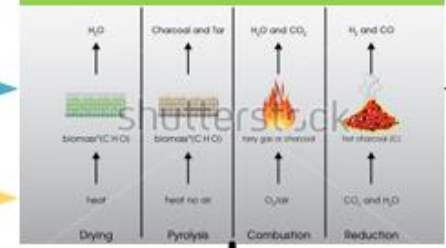
Cement plant

Heat exchanger

Exhaust gas

PYREG

Slow Pyrolysis



Urban residues

Steam

Electricity

Steam turbine

Agricultural residues

Biochar

For local farmers or wastewater/ gas treatment

Emergence of new and local synergies

Techno-economic estimations

Description	Number	Unit
Investment Pyrolysis and Methanol plant	672	M$ CAD
Feedstock consumption	2400	to/d
Pyrolysis gas production	1536	to/d
Biochar production	864	to/d
Methanol production	200	to/d
Biochar selling price	320	CAD/to
Methanol selling price	540	CAD/to
Internal rate of return (IRR)	14,2	%

Assumptions from [2, 4]

Conclusions

- Reduction of heat energy loss and improvement of the energy efficiency
- Production of biochar (fertilizer, activated charcoal) and chemicals (CCU, methanol)
- Attracting further investments and job creation (Chandler sea port, chemical industry)
- Offering a new option for the Îles-de-la-Madeleine for its energy transition (Direct Methanol Fuel Cell)
- Social acceptability gains for the cement plant
- And just imagine the additional synergies by sequestrating and giving value to the CO2 of the cement plant…
- **Worldwide application for energy intensive plants, especially in the regions of the RLS Energy Network !**

Team RLSynergy brings more to your region with energy based solutions !

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References

[1] Carsten Beier, 2010. Less than they are worth. Research News, Volume 12, pp. 13-14.

[2] Tristan R. Brown, M. M. W. a. R. C. B., 2011. Estimating profitability of two biochar production scenarios: slow pyrolysis vs fast pyrolysis. Biofuels, Bioproducts and Biorefining, Volume 5, pp. 54-68.

[3] Indu Shekhar Thakur, e. a., 2018. Sequestration and utilization of carbon dioxide by chemical and biological methods for biofuels and biomaterials by chemoautotrophs: Opportunities and challenges.. Bioresource Technology, Volume 256, pp. 478-490.

[4] Shabangu, e. a., 2014. Techno-economic assessment of biomass slow pyrolysis into different biochar and methanol concepts. Fuel, Volume 117, pp. 742-748