Developing a Yukon Energy Strategy

Technical Workshop: Follow up notes

Whitehorse, 20/21 November 2007

About this document

This volume contains working notes from the Yukon energy strategy technical workshop held on 20/21 November, 2007 in Whitehorse.

These working notes are for the use of participants. They do not necessarily reflect official government policy and the views and initiatives discussed are those of participants and not necessarily the Department of Energy, Mines and Resources.

The notes are not meant to document all the comments, background and issues discussed at the workshop. They will be most meaningful to those who participated in the discussions.

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Contents

The Vector Research factbase presentation on Yukon energy sources and use is available separately

Overview of Yukon energy strategy objectives, process

Output from plenary and breakout sessions

- Workshop agenda/objectives
- Day 1 breakouts: vision/principles, threats/constraints and potential initiatives
- Day 1 plenary: flashpoints and tradeoffs
- Day 1 plenary: prioritized set of potential initiatives
- Day 2 plenary: vision and principles working session
- Day 2 breakouts: refined initiatives

Notes on next steps in the Yukon energy strategy process

Objectives of the Strategy

- Sustainable development, management and use of energy in the territory
- Long term vision
- Key principles and goals
- Priorities for new policies, plans and programs
- Commitments to specific actions

Scope is Comprehensive

- All types of energy used, including: non-renewable and renewable energy sources and electricity
- Energy production, transportation, consumption, energy efficiency, conservation and emissions
- Energy use in the residential, commercial, institutional, industrial and transportation sectors

Developing the Strategy

- Thorough technical review and analysis on the issues to be addressed
- Coordination with related initiatives (e.g. Climate Change Action Plan)
- Opportunities for consultation and participation at key stages in the process
- Timely completion by the fall of 2008

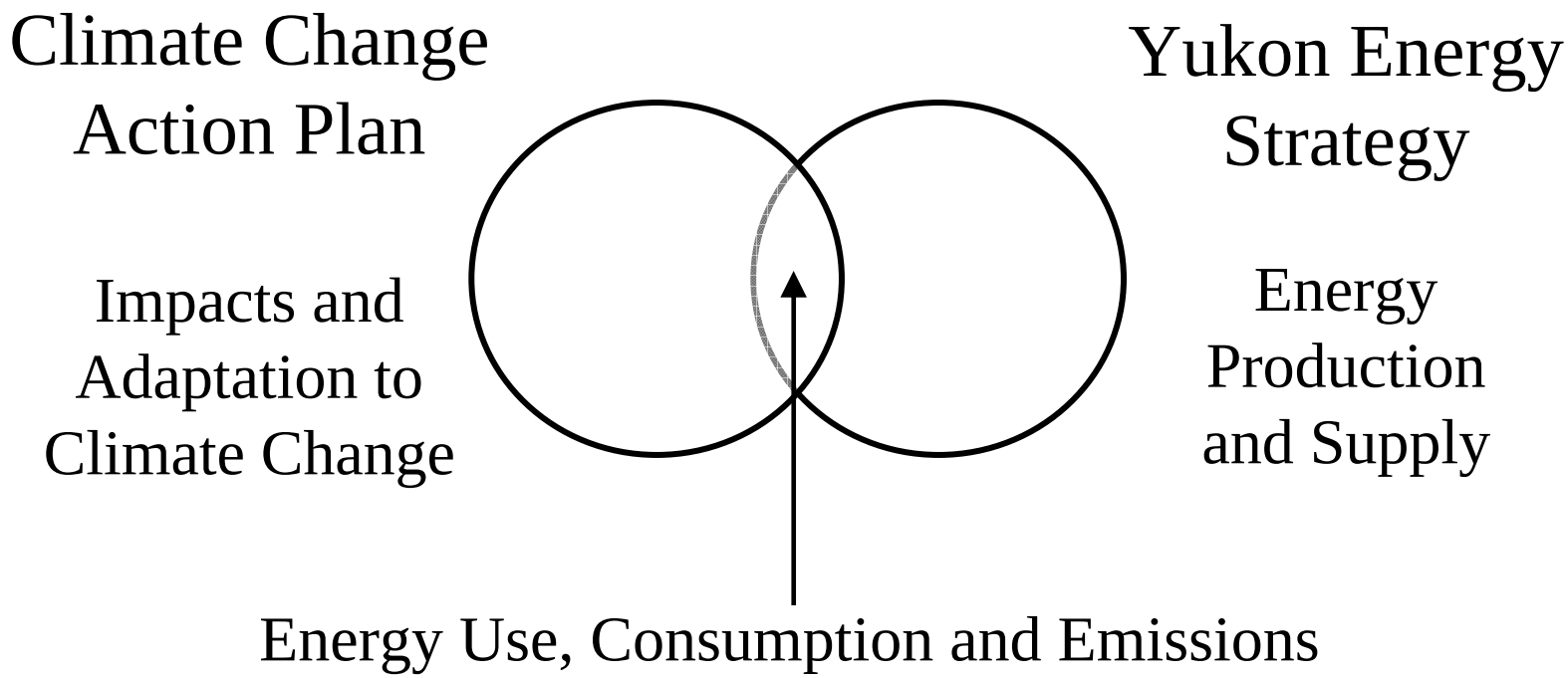
Scoping the Factbase and Issues

- Background Research Project
  - Other provinces and territories
  - Existing initiatives
  - Yukon energy sector
- Initial discussions with governments and key stakeholders
- Technical Workshop, November 20/21

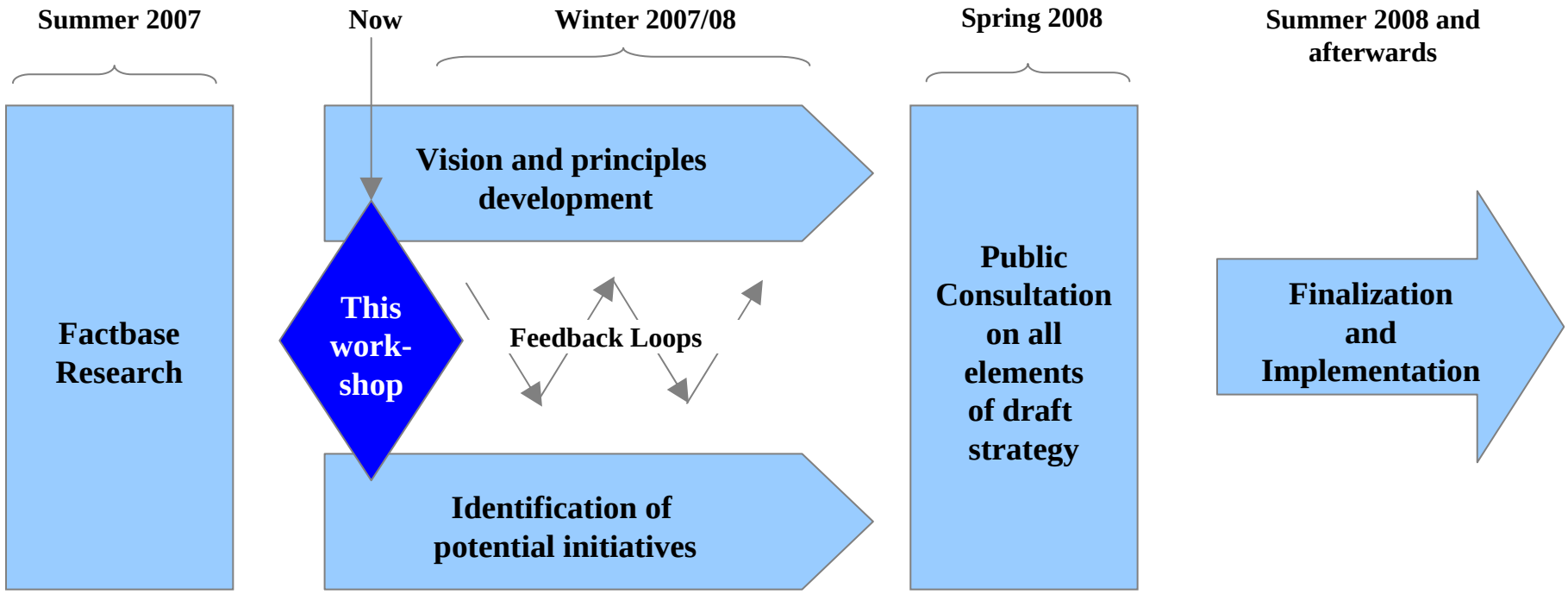
The Circumpolar Context

- Global energy supplies
- Barometer of climate change
- Extracting non-renewable resources
- Developing renewable and energy efficiency projects
- Lessons from circumpolar countries

Energy and Climate Change



Energy Strategy Process Overview



- Baseline facts on energy use, production, global trends, best practices

- Create a vision that is informed by what is possible
- Ensure that the action plan lives up to the vision

Day 1: Detailed agenda and specific objectives

Day 1

830	Coffee and muffins				
900	**Introduction**	**Welcome by facilitator – Keith Halliday Overview by the Hon. Archie Lang, Minister of Energy, Mines and Resources (10 minutes)**			**Develop shared understanding of process and the Yukon's starting point**
910	**Energy strategy process**	**Process overview by Jacqueline Hynes, Senior Planner, EMR (10 minutes) Link with Climate Change Action Plan by Johanna Smith, Dept. of the Environment (10 min.)**			
930	**Factbase**	**Starting Point: Factbase Presentation by Paul Kishchuk, Vector Research (50 minutes)**			
1020	Break				
1045	**Workshop overview**	**Workshop objectives, process and deliverables by Keith Halliday (5 minutes)**			
Breakouts: Opportunities • #1A – Renewable • #1B – Non-renewable • #1C – Energy efficiency		**Breakout #2: Threats and Constraints**	**Breakout #3: Principles for a Yukon Energy Strategy**	**Breakouts: Program options for government • #4A – Programs/incentives • #4B – Taxes/regulations**	**Generate ideas and estimate the size of their potential impact**
1215	Lunch provided	1215-1245: Lunch (no program) 1245: Lunch activity "Energy Dragon's Den"			
1315	**Plenary Working Session**	**10 minute presentations by each breakout group (5 minutes plus 5 minutes questions) (1 hour) Facilitated discussion: What are the top 5 conflicts, issues and trade-offs surfaced by the breakout teams? (45 minutes)**			**Share ideas and identify key public policy 'flashpoints'**
1500	Break				
1520	**Prioritization**	**Facilitated discussion of priority opportunities for further investigation**			**Develop first cut of potential priority initiatives for the Yukon**
1600	Conclusion				

Day 2: detailed agenda and specific objectives

Day 2

830	Coffee and muffins		
900	**Recap**	**Review of agenda and Day 1's output by Keith Halliday (10 minutes)**	
910	**Vision and principles**	**Plenary discussion of potential vision and principles led by Jacqueline Hynes (50 minutes)**	**Discuss elements of vision/ principles to assist working team in refining them**
1000	Break		
1015	**Breakout overview**	**Workshop objectives, process and deliverables by Keith Halliday (5 minutes)**	
Breakouts: Refining potential major initiatives from Day 1 (55 minutes)			**Refine yesterday's 'big ideas'**
1115	**Plenary**	**Review of each group's efforts and overall conclusions on its initiative**	**Get a feel for what an action plan might feel like ... and if it aligns with the emerging vision**
1215	Concluding remarks Lunch provided	Conclusions and next steps by Jacqueline Hynes, Senior Planner, EMR (5 minutes)	

Workshop participants from Yukon, federal and First Nation governments, private sector and non-governmental backgrounds

Participant	Organization
David Black	Association of Yukon Communities
Sascha Weber	Carcross/Tagish First Nations
Sabine Schweiger	City of Whitehorse
Kirk Tyler	City of Whitehorse
Ryan Peterson	Dawson Renewable Resource Council
Bengt Pettersson	EBA Engineering Consultants
Mike Toews	FH Collins School
Mallory Collins	FH Collins School
Lee Hawkings	FH Collins School
Joseph Buyck	First Nation of Nacho Nyak Dun
Steven Buyck	First Nation of Nacho Nyak Dun
Keith Halliday	Halliday & Company
Ellen Sedlack	INAC Environment
Michael Hine	INAC Strategic Investments
Ted Danyluk	Kluane First Nation
Tony Zedda	Kobayashi + Zedda Architects
John Maissan	Leading Edge Projects
Mike Howarth	Natural Resources Canada
Jen Turner	Northern Climate Exchange
Stephane Aucoin	Outside the Cube
Jerry Kruse	Selkirk Renewable Resource Council
Lena Joe	Selkirk Renewable Resource Council
Simon Lapointe	Ta'an Kwach'an Council
Bill Kendrick	Trondek Hwech'in First Nation
Paul Kishchuk	Vector Research
Scott Milton	YG Economic Development
Jacqueline Hynes	YG Energy, Mines and Resources
Bob Kuiper	YG Energy, Mines and Resources
Ed vanRanden	YG Energy, Mines and Resources
John Spicer	YG Energy, Mines and Resources
Shirley Abercrombie	YG Energy, Mines and Resources
Jim Bell	YG Energy, Mines and Resources
Richard Corbet	YG Energy, Mines and Resources

Participant	Organization
Jen Meurer	YG Energy, Mines and Resources
Ella LeGresley	YG Energy, Mines and Resources
Bob Collins	YG Energy Solutions Centre
Shane Andre	YG Energy Solutions Centre
Colin McDowell	YG Energy Solutions Centre
Sean MacKinnon	YG Energy Solutions Centre
Johanna Smith	YG Environment
Christopher Belanger	YG Environment
Christine Smith	YG Executive Council Office
Manon Moreau	YG Executive Council Office
Robert Magnuson	YG Highways and Public Works
Steven Gasser	YG Highways and Public Works
Juergen Korn	YG Yukon Housing Corporation
Bill Greer	YG Yukon Housing Corporation
Dave Tenney	Yukon Chamber of Mines
JP Pinard	Yukon Conservation Society
Lewis Rifkind	Yukon Conservation Society
Phil Borgel	Yukon Electrical Company Ltd.
Jerome Babyn	Yukon Electrical Company Ltd.
Craig Steinbach	Yukon Electrical Company Ltd.
Hector Campbell	Yukon Energy Corporation
Michelle Clusiau	Yukon Environmental Network
Wendy Shanks	Yukon Utilities Board
Don Hutton	Yukon Wood Products Association
Brad Roberts	Yukon Wood Products Association
Elaine Wyatt	Village of Carmacks
Lee Bodie	Village of Carmacks
Margrit Wozniak	Village of Mayo
Glenn Stephen	White River First Nation
John Streicker	
Rick Nielsen	
Peter Percival	

Breakout session overview

Breakouts and objectives

Breakout 1A/B/C: Opportunities.

- Identify opportunities for new energy sources or to use less, cheaper or lower-emission energy
- Estimate the size of each idea's impact
- **Breakout 1A – Renewable energy**: Ideas to generate/produce more energy for the Yukon from renewables
- **Breakout 1B – Non-renewable energy.** Ideas to produce more energy from non-renewable sources
- **Breakout 1C – Energy efficiency.** Ideas to use less, cheaper or lower-emission energy

Breakout 2: Threats and constraints.

- Identify the biggest threats and constraints to energy use in the Yukon
- Estimate the impact of each

Breakout 3: Principles for a Yukon energy strategy.

- Identify principles and key trade-offs to inform a Yukon energy policy

Breakout 4 A/B: Program options for Government.

- Identify public policy options for government to influence Yukon energy production and use
- Prioritize the options
- Breakout 4A – Programs and incentives
- Breakout 4B – Taxes and regulations

How breakouts will work

Each group will have 6-8 pre-identified participants and a facilitator

Groups will discuss issues, generate output and document it on flipcharts provided

Each group will report back to the plenary for a 5 minute presentation (with 5 minutes of questions)

Ground rules

Ground rules discussed earlier:

- Please be present and participate fully
- Stay in the room – no other meetings, cellphones or blackberries except at breaks
- Please wear your 'Yukon hat'
- 'Chatham House rules' apply

Plus

- Build on ideas in this breakout... criticism comes later
- Drive to output and make your best preliminary decisions based on information available
- Work hard to come to a consensus
- Document your output on the flipcharts, plus key data gaps that emerged

For reference: ideas contributed in advance

Breakout #1A: Renewables	Breakout #1B: Non-renewables	Breakout #1C: Efficiency	Breakout #2: Threats and Constraints
Wind: more wind power generation for Whitehorse grid	Yukon oil/micro refinery	Insulation/building standards	Rising global energy prices (e.g., $5/litre gas and heating oil?)
Wind: microwind in communities	Yukon natural gas	Public transit	Volatile energy prices
Solar	Yukon coal	Streetlight policy	Supply interruptions
Geothermal heating for institutional buildings, communities, new subdivisions	Mini-nuclear	Subdivision design	Carbon taxes/cap and trade costs
Biomass	Natural gas from coal	Other commuting solutions; e.g., electric cars	Isolation from continental grid
Biofuels		Migrate fossil fuel heating to hydro-electric (especially shoulder season)	High sensitivity to transportcosts
Hydro: more large scale hydro to replace significant fossil fuels			Small scale to support innovation
Micro-hydro in communities			Energy-intense industries
			Capability and O&M constraints from sophisticated new technologies

Breakout #3: Principles	Breakout #4A: Programs and Incentives	Breakout #4B: Taxes and Regulations
Economic cost?	Training	Carbon tax
Yukon production development?	Education	User pay
Economic development?	Subsidies for insulation, climate-friendly energy	Emissions standards
Climate change?	Net metering	Building code
Renewables?		Tax on propane not just home heating fuel
Social impact?		

Breakout 1A: Renewable energy opportunities

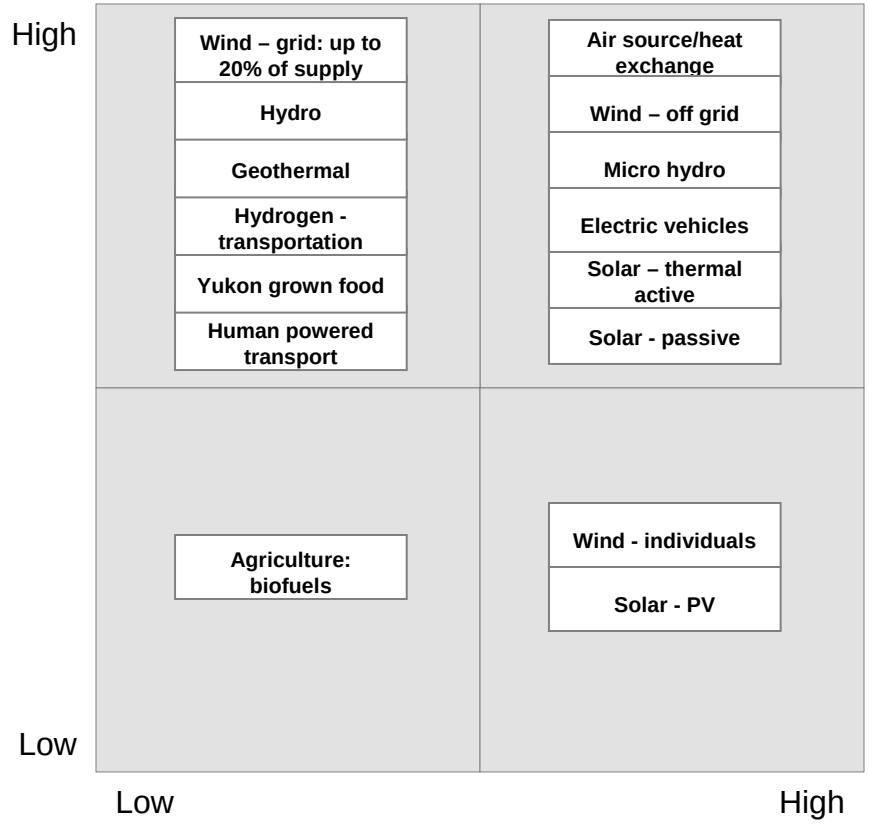
Rough Notes from Breakout

Breakout process

1. Generate list of opportunities
2. Discuss size of benefits and ease of implementation
3. Populate output template
4. Review results: does it capture your discussions overall?
5. Identify someone to present the findings to the plenary

Note: benefits include financial, environmental and social benefits. A 'high' benefit project would be very strong on 2 or 3 of these dimensions.

Output Template



Breakout 1B: Non-renewable energy opportunities

Rough Notes from Breakout

Breakout process

1. Generate list of opportunities
2. Discuss size of benefits and ease of implementation
3. Populate output template
4. Review results: does it capture your discussions overall?
5. Identify someone to present the findings to the plenary

Note: benefits include financial, environmental and social benefits. A 'high' benefit project would be very strong on 2 or 3 of these dimensions.

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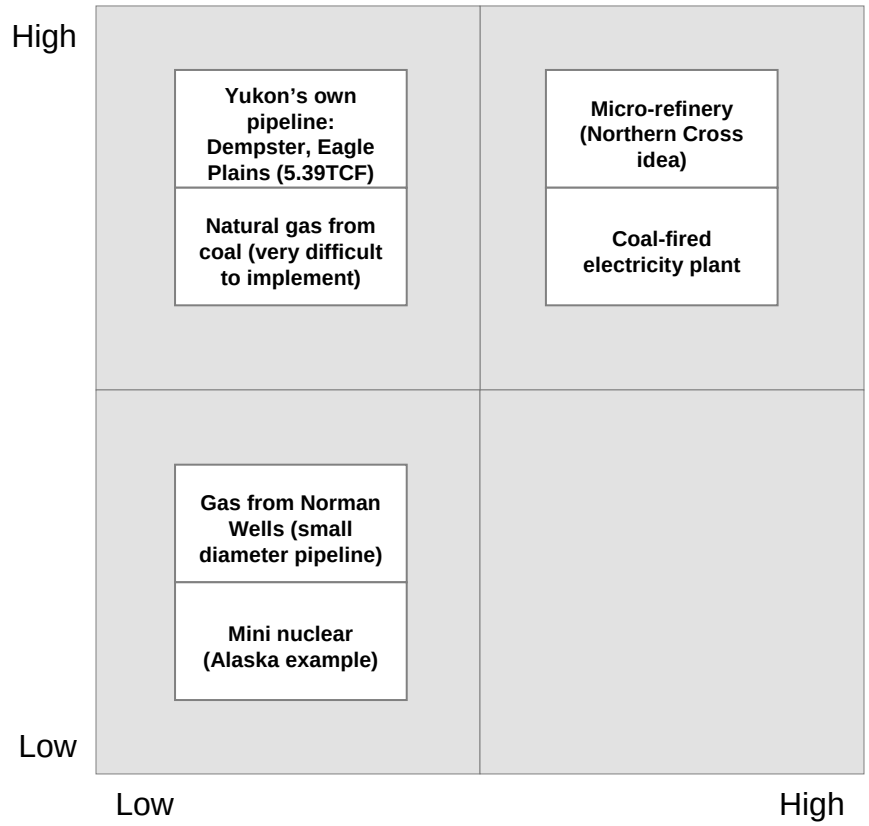

Breakout 1C: Energy efficiency opportunities

Breakout process

1. Generate list of opportunities
2. Discuss size of benefits and ease of implementation
3. Populate output template
4. Review results: does it capture your discussions overall?
5. Identify someone to present the findings to the plenary

Note: benefits include financial, environmental and social benefits. A 'high' benefit project would be very strong on 2 or 3 of these dimensions.

Output Template

Rough Notes from Breakout

Overflow
- Transportation research monitoring
- Higher building standards (home, government)
- Evaluate transportation rules and efficiency regulations

Overflow
- District heat
- Smaller buildings
- Reduce waste (to zero waste)
- Vehicle sharing
- Local product/import substitution

Benefits

Benefits \ Ease of Implementation	Low	High
High	Increase hydro for all energy needs Transit: improved service Smart meters: electrical Densification Anti-idling campaign Transport planning (community planning) Alternative transport; e.g., trains Metering water, fuel, electricity	Energy star: incentives, requirements No barriers to demand side mgmt (YEC) Improve YG fleet efficiency Energy resource allocation Zoning Efficiency tax incentives, remove disincentives Private efficiency incentives Yukon spirit of efficiency
Low	Transportation: intra-community	Free/subsidized public transit Efficient street/public lighting

Ease of Implementation

Breakout 2: Threats and constraints

Rough Notes from Breakout

Breakout process

1. Generate list of threats and constraints
2. Discuss scale of threat and likelihood
3. Populate output template
4. Review results: does it capture your discussions overall?
5. Identify someone to present the findings to the plenary

Note: negative impacts include financial, environmental and social benefits. A 'high' negative impact project would be very damaging on 2 or 3 of these dimensions.

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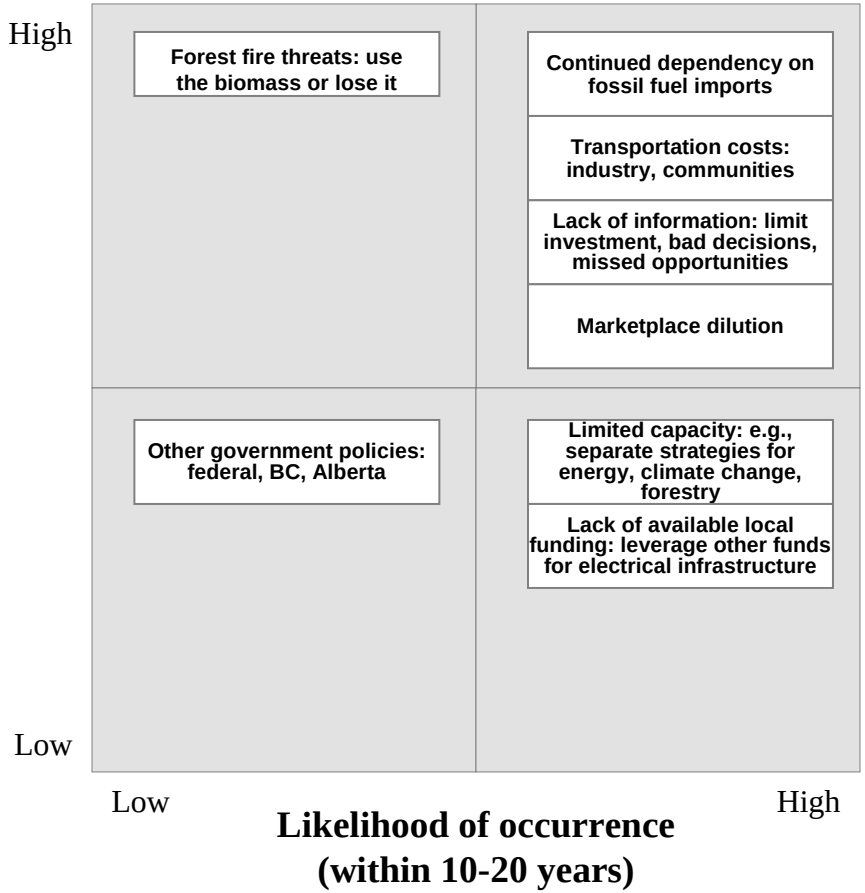
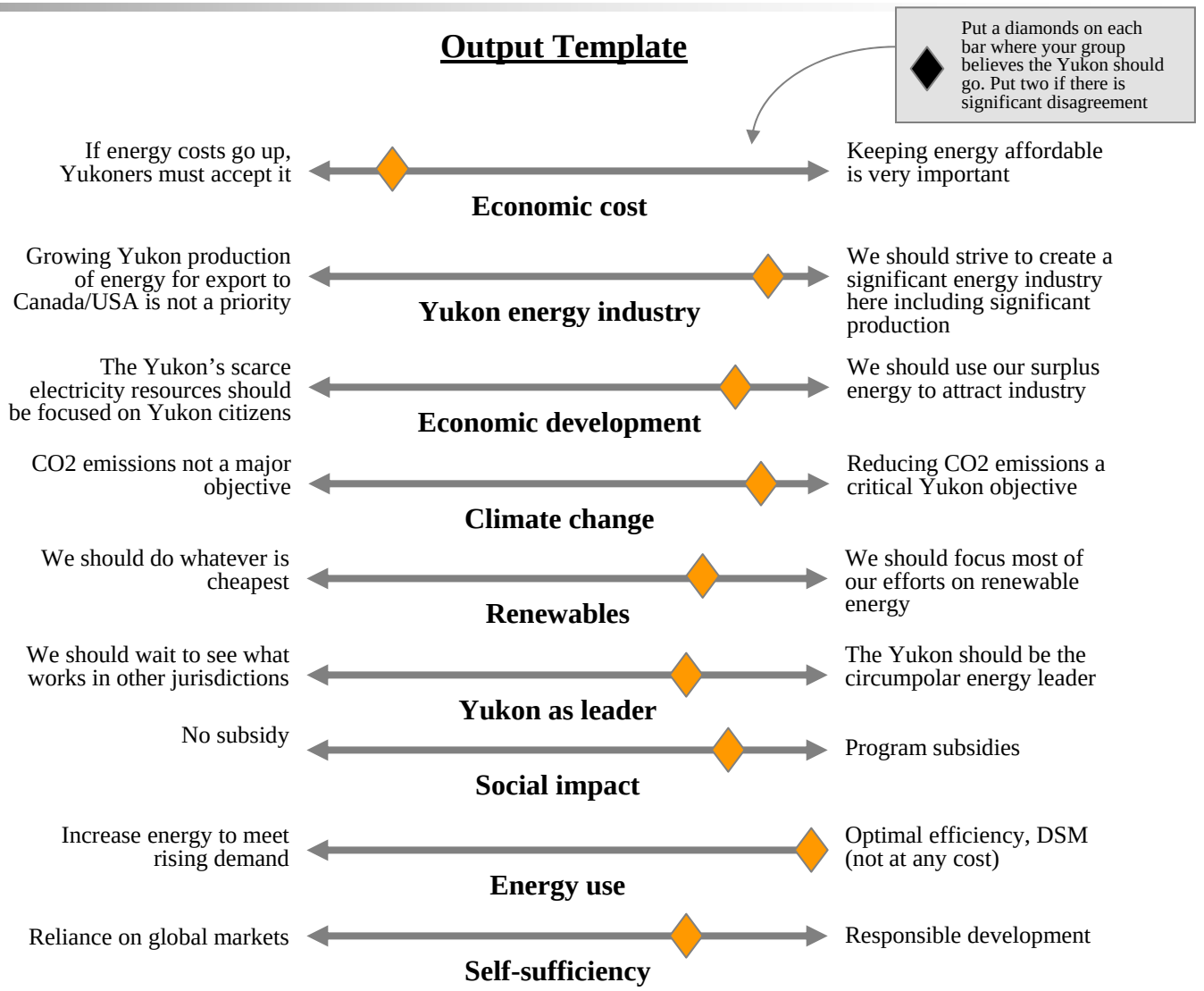


Breakout 3: Principles
Output from Day 1 small group working session

Rough Notes from Breakout
(denotes group point of view)

Breakout process

1. Generate list of potential issues for discussion: e.g., growth in energy use, CO2 emission reductions, local production vs. imports, etc.
2. Identify the 5-7 most important and populate slider bars with the 'two extremes'
3. Put a diamond on the bar where the group consensus is (or multiple diamonds in case of disagreement)
4. Identify someone to present the findings to the plenary



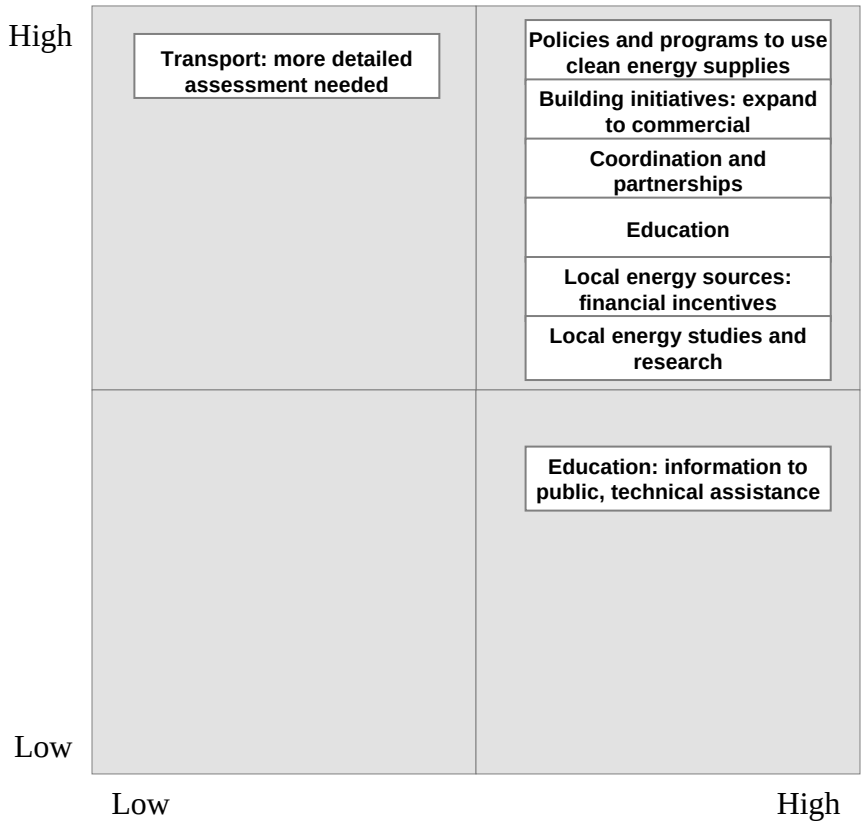
Breakout 4 A: Government programs and incentives

Rough Notes from Breakout

Breakout process

1. Generate list of potential Program options; e.g., excise taxes, carbon tax, retrofit subsidies, investments in renewable generation, etc.
2. Discuss size of benefits and ease of implementation
3. Populate output template
4. Review results: does it capture your discussions overall?
5. Identify someone to present the findings to the plenary

Output Template



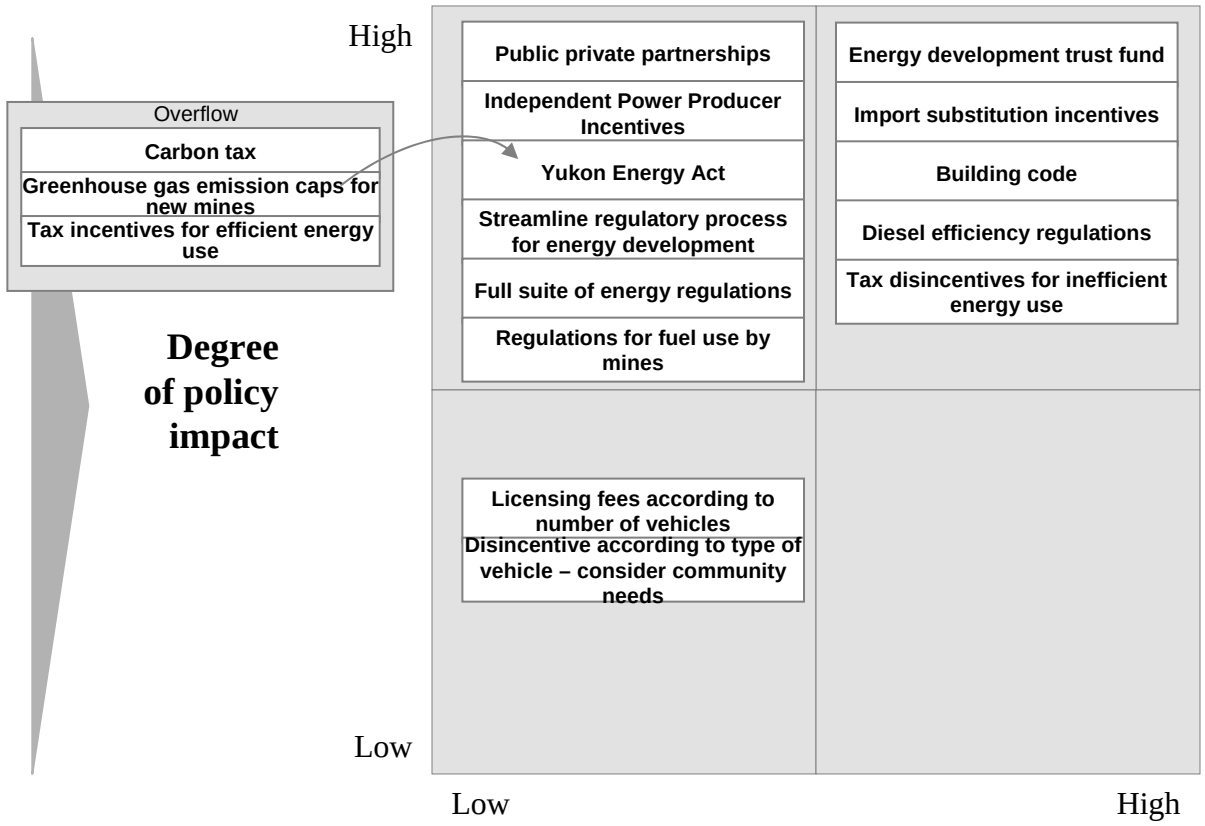
Breakout 4 B: Government - taxes and regulations

Rough Notes from Breakout

Breakout process

1. Generate list of potential Program options; e.g., excise taxes, carbon tax, retrofit subsidies, investments in renewable generation, etc.
2. Discuss size of benefits and ease of implementation
3. Populate output template
4. Review results: does it capture your discussions overall?
5. Identify someone to present the findings to the plenary

Output Template



Plenary discussion identified multiple conflicts/flashpoints to be aware of Energy Strategy goes forward

Flashpoint	Degree of Misalignment
• Pace and ambition: Can we agree on the need to be truly ambitious (given the scale of the financial and environmental risks) and to move faster; ie., more than 'business as usual'?	Very high degree of concern that we cannot go far and fast enough without strong leadership
• Budgets: How will the government budgeting process cope with so many good ideas scattered across multiple departments vs. current spending priorities?	Very high; e.g., which programs will be reduced to pay for renewable projects?
• Tax: how much higher should our fuel tax go (it is the closest thing we have to a carbon tax) and should it include all carbon fuels such as propane?	Very high. Wide range of views about whether/how much to use tax lever
• Realistic implementation of a Yukon energy strategy: will we end up with lofty goals but no plan/resources to implement?	Significant concern expressed
• Leading edge, not bleeding edge: how can we strike the right balance of new approaches with the risk of technology 'white elephants'? Also, how do we strike the right balance of small, mid and large projects?	Significant concern about government's ability to navigate these issues successfully, with considerable public resources at risk
• Twin goals: Should non-renewable and renewable energy strategies be linked; ie., suggestion of 'South Africa diamond strategy' where we increase fossil fuel production for export but reduce fossil fuel use locally?	Some misalignment. Some not sure such divergent goals should be pursued at same time
• Early action vs. thinking it through: should we immediately drive to implement some positive initiatives we are 90% sure will be beneficial, or wait to fully define the Yukon's energy vision, principles via public consultation and debate	Some misalignment. Some not sure it is useful to work on specific actions before a high-level vision is agreed

Summary of Day 1 initiative prioritization: seven potential 'big ideas' to work on during Day 2

1. Renewable energy program: government commits to fund research, examine feasibility/business case, and trial implementations on a set of renewable ideas; e.g., say 2-4 of micro hydro, biomass, geothermal, air source heat pumps, etc.

2. Non-renewable energy: what can the government do to catalyze the development of 1 or 2 significant Yukon energy projects; e.g., micro-refinery

3. Improve efficiency: develop a package of building standards, codes, demand side management, subsidies for appropriate building technologies, carpool campaign, anti-idling campaign, further research required to confirm business case

4. Climate change fund/carbon tax: should the Yukon have an 'across the board' voluntary fund or compulsory tax to generate funding to jump-start Yukoners' adjustment towards carbon neutrality/reduction/offsets? Should it be mandatory or a general tax? How big should it be?

5. Transportation: what would be the elements of an action plan to significantly reduce the fossil fuel used in transportation (our largest single source of fossil fuel use/carbon emission)?

6. Major hydro: Assuming that we will need significantly more renewable energy in the future if we are to reduce fossil fuel use, what are the options for major new energy developments? E.g., major hydro developments, micro hydro, broader approach to renewable independent power producers.

7. How should we use our surplus hydro power to migrate away from fossil fuels, especially for heating?

What is an 'Energy Strategy'? – Two extreme versions to prompt discussion

Vision: Where does the Yukon want to be in 20 years?

>50% energy from hydro, geothermal, wind, solar	**Energy Sources**	Current hydro capacity plus increased fossil fuels
25% less per person	**Consumption**	25% more per person
Mix of low cost local sources and high cost imports	**Cost**	High, with high exposure to global energy prices
Still a net importer	**Local Production**	Net exporter, with 5000 new jobs in oil & gas
25% lower CO2 emissions	**Climate Change**	25% higher CO2 emissions
Actively driving change through incentives, taxes and regulation	**Role of Government**	Minimalist

We need to identify concrete actions to take, but should keep in mind the long term vision we have for the Yukon's energy future

Draft working principles: updated following discussion during the plenary session

Sustainability	developing an energy sector that is environmentally, economically and socially sustainable for present and future generations.
Energy Security	ensuring an adequate and reliable supply of energy at a reasonable cost and reducing dependence on non-renewable energy sources.
Self-sufficiency	promoting the economically, environmentally and socially responsible development of Yukon's renewable and non-renewable energy resources.
Optimize Benefits	optimizing socio-economic and environmental benefits for Yukon from energy development and use.
Climate change	ensuring linkages with climate change initiatives and identifying opportunities to reduce greenhouse gas emissions.
Leadership	demonstrating Yukon Government leadership in responsible energy management, including infrastructure development, energy efficiency and conservation.
Partnerships	engaging Yukon First Nations, communities and the private sector in the development and management of energy resources.

Working notes from vision plenary discussion: key messages

Consensus that government should define an overall 'stretch goal' that all policies and actions can be aligned against, and which can be communicated to Yukoners

- Examples discussed included "Zero carbon emissions by 2050," "5000 jobs in the Yukon oil and gas sector by 2020" and "Reduce fossil fuel consumption by 50% from 2007 levels by 2025"

High degree of agreement across development/environment spectrum that:

- threats to our finances, lifestyles and planet from CO2 emissions are real and the Yukon government should proactively support the migration of our energy use from fossil fuels to renewable sources (especially for residential/commercial heating, and transportation)
- developing the Yukon's oil and gas resources over the coming decades is a priority; e.g., generating government revenue, jobs and satisfying global market demand as fossil fuel demand will continue to grow in the near and mid term

Mix of views on government role

- Some supporting an active government role via programs, major infrastructure projects, subsidies, tax rebates etc
- Others believing government should focus on the overall framework and let Yukon enterprises and citizens take the lead; e.g., use levers like electricity prices and taxes to shift incentives

Day 2: Approach for today's breakout sessions

Objective: refine ideas and define what a government program would look like

Key questions we would like you to answer

- What are the objectives and scope of your initiative?
- Who are the key partners that would be involved?
- What are the top 3 issues/blockages that could derail it? What are options to address them?
- What kind of government support is required? Legislation? Funding?
- What are the big question marks/data gaps that would need to be refined?
- Overall, do you still believe the benefits are 'large' and relatively easy to implement; ie., should this initiative be 'on the list' for further study as part of an eventual energy strategy based on what you know now?

Please be prepared to come back to the group and present your idea in 5-10 minutes

Day 2 output: Overview of Renewable Energy Program

Description	• Develop a renewable energy program for: micro hydro, biomass, solar thermal, geothermal, air-source, wind
Benefit Quantification	• Displace fossil fuels to reduce GHG emissions to the maximum extent possible • Increase energy security, stability and efficiency by diversifying supply • Cost stability

Who would be involved/ key partners?	Key issues and potential solutions	Government support and/or funding required	Key fact gaps/ priority research issues and next steps

• YG role:
  • Filter for potential ideas
  • Create inventory/library
	• Difficulty to identify priorities from multiple technology options
	• Difficulty to provide sustained leadership and coordination to achieve impact
	• Would require incremental funding
	• Potential solution: YG funding for a small team to prioritize and execute a set of 3-5 trial projects/ implementations
		• Provide funding and technical assistance
		• Net metering and different costs for green energy
		• Targeted studies: micro hydro, more hydrological information
		• Financial analysis – i.e. the business case
		• Technical needs analysis
		• Technical support and expert monitoring
		• Demonstration/pilot project when technology is in infancy
			• Possible tie to the north American grid
			• Infrastructure support and funding
			• Identify target percentage as part of energy mix

Overall Conclusion	• Program has strong potential and should be considered strongly as an option for a Yukon energy strategy

Day 2 output: Overview of Non-Renewable Initiative (Eagle Plains micro-refinery)

Description	• Facilitate a boutique micro-refinery at Eagle Plains to supply Yukon customers (diesel) • Note: this was the top non-renewable initiative identified by the non-renewable break out team
Benefit Quantification	• Jobs, skills and training • Less transportation for fuel imports, import substitution, self-reliance • Tax revenues

Who would be involved/ key partners?	Key issues and potential solutions	Government support and/or funding required	Key fact gaps/ priority research issues and next steps
• Northern Cross • First Nations • Yukon Government – e.g. road maintenance • Trucking company • Service and supply companies • Key stakeholders	• Cost: cost sharing for research and demonstration • Environmental considerations: YESAA review, small footprint, mitigation, best management practices • Preference for renewable energy demonstration projects: education, local jobs • Market size in Yukon: measure against need for self-reliance	• Project guidance and coordination • Regulatory framework • Guaranteed sales to government • Training, target programs • No straight cash incentives, but re-target existing programs	• Feasibility is unknown • Economics • Residue disposal • Explore possibility of locating micro-refinery near Dawson at Brewery Creek to be closer to possible workforce

Overall Conclusion	• Project is worth investigating as this is the only non-renewable project that offers a mid-term solution towards self-reliance

Day 2 output: Overview of a Major Efficiency Program

Description	• Energy efficiency program for all buildings
Benefit Quantification	• Save money • Defer need for new energy development • Greenhouse gas reductions • Climate change adaptation • More energy available for export/reduce imports • Provide leadership • Health and safety

Who would be involved/ key partners?	Key issues and potential solutions	Government support and/or funding required	Key fact gaps/ priority research issues and next steps

• YG: YDC, CS, YHC, HPW, EMR/Energy Solutions Centre, Yukon College
• Federal: NRCan, NRC, CMHC, INAC
• First Nations
• Municipal: all governments, AYC
• Industry: construction, design, manufacturers/suppliers
• Realtors
• Research community
	• Lack of standards and regulation: develop these
	  • Compliance mechanism
	  • Enforcement and rectification
	• Program/policy
	  • Incentives – power smart
	  • Shift focus from supply to demand side management
	• Education/training
	  • Educate buyers and sellers
	  • Carrot and stick
	  • Trades curriculum
		• Government assistance on key issues identified to left	• See issues to left

Overall Conclusion	• Program has strong potential and should be considered strongly as an option for a Yukon energy strategy

Day 2 output: Climate change fund/carbon tax

Description	• Voluntary carbon fund, spending contributions on range of renewable energy/efficiency initiatives
Benefit Quantifi-cation	• Reduce carbon footprint – working towards becoming carbon neutral • Generate funding for renewables/energy efficiency • The money stays in the territory • Create a new economic sector/local marketplace • This initiative touches the transportation sector

Who would be involved/ key partners?	Key issues and potential solutions	Government support and/or funding required	Key fact gaps/ priority research issues and next steps

• Private sector – e.g. Air North
• Governments (e.g. YG departments, municipalities)
• First Nations development corporations
• Mining sector
	• Allocation of scarce YG resources to invest in the fund
	• How much should the offset payments be set at? Suggest $50/tonne of CO2
	• Who pays for offsets? End users
	• A mandatory program will have affordability issues – however, it could be a tax shift from income tax to a carbon tax
	• Carbon tax is easy to administer
	• Launch a voluntary program to get the key structures in place and build support – mandatory program will be an option
		• Potential role for government to:
		  • Establish the fund
		  • Financial administration of the fund – need accountability
		  • Provide transparency – i.e. what are the existing taxes
		  • Participate in the watchdog group – or this could be completely arm's length from government
		• The Yukon Foundation provides a model of a fund that was developed without government support
			• Explore whether a voluntary program will work – i.e. Will it generate enough participants and funds? Could provide recognition for participation (e.g. corporate social responsibility)
			• Research the administration of the fund – e.g. look at other examples such as offsetters.ca, however, this could be the first government-led example in Canada
			• Determine who would be willing to pay – education will be needed

Overall Conclusion	• Program has strong potential and should be considered strongly as an option for a Yukon energy strategy

Day 2 output: Overview of Transportation initiative

Description	• Personal mobility efficiency: incentives and programs for driving less and driving more "responsibly"- fuel efficiency, carpooling, etc. • Integrated transit system
Benefit Quantification	• Moving groups of people together to get to the same destination points • Integrate school and work travel

Who would be involved/ key partners?	Key issues and potential solutions	Government support and/or funding required	Key fact gaps/ priority research issues and next steps
• Potential for public private partnerships • The private sector can address transit gaps if incentives are provided	• Gas is still relatively cheap • Personal choices – mindset to have our own vehicle • There are incentives to drive: free parking, roads built to drive – walking, cycling and playing are discouraged • No transit outside City boundary • Policy for government vehicles (employees only, doesn't promote carpooling to meetings in communities) • Public transit needs to be sexy/fun/what other people are doing- programming on buses	• Fuel efficiency standards for vehicles • Credits for self-propelled activity • No idling campaign • Pay-as-you drive fees (Whitehorse area only)	• Need more assessment on consumption patterns/statistics on where and when people are driving • Enhanced/improved detail for the transportation factbase in order to find synergies in travel patterns • Full cost-accounting of car travel v. public transit (e.g. road costs, traffic, accidents)

Overall Conclusion	• Program has strong potential and should be considered strongly as an option for a Yukon energy strategy

Day 2 output: Overview of Major Hydro Project

Description	• Additional 50 to 200 megawatts from 1 to 3 projects (Dams and transmission lines) • Connection to North American grid (100Mw required) • Maximize meeting Yukon needs, need to look at economics of local and export demand
Benefit Quantification	• Energy self-sufficiency • Jobs and economic opportunities/diversification • Minimize risk • Lose customers, having surplus energy, loss of load • Reduce hydrocarbon emissions • Long term price stability • Cheaper power • Easier transportation

Who would be involved/ key partners?

- First Nations: Partnerships/ ownership/ shareholder; economic development, employment, training; design – environmental assessment/ operations, equity or land
- Utilities: YEC/YECL; public and private; fit into existing infrastructure/grid operation; Expertise – investor
- Non-government organizations; e.g. Yukon Conservation Society; mandated boards and councils (Renewable Resource Councils) Chambers of Commerce, Mines
- Yukon Utilities Board: regulator/ player/YESAA/Water board
- Industry: consumers; customers – identify market; provide financial investment for projects; provide expertise/advice/support

Key issues and potential solutions

- Financial risk of stranded asset
  - Create opportunities for using surplus energy
  - Share risk with customer
  - Long term forecast
  - Options for export via grid
  - Partnerships
  - Wrong location: line losses, poor utilization/storage
- Environmental
  - Flood line/storage
  - Involve stakeholders
  - Consultation/communication, due diligence
- Permitting/regulatory uncertainty; large up front investment required before you know if it will be approved
- Lag time – development takes 5-10 years; Proactive: identify project early and conduct market analysis

Government support and/or funding required

- Yukon government: facilitate supportive environment: policies, funding; conduit for federal funding; leadership role
- Federal government: funding for initiatives; regulatory; water survey
- Municipalities: local stakeholder support; infrastructure support

Key fact gaps/ priority research issues and next steps

Fact gaps/research issues:
- Lack of communication or proactive planning: feds/YG/FNs
- Lack of sites/information: hydrology, layout, costs
- Market identification
- Energy strategy is needed
- Forecasting/probability/market survey/pricing
- Land use/community planning

Next steps:
- Leadership and establish process
- Do the due diligence: research, consultation, feasibility, options
- Decision – do we support or not?

Overall Conclusion	• Program has large benefits but also large risks and costs; more analysis needed

Day 2 output: Overview of Surplus Hydro Initiative

Description	• Use surplus hydro power at most times of day/year to replace significant fossil fuels in
	  • Residential/commercial heating; e.g., air source heat pumps, cheap time of year/day electrical heating with surplus hydro, etc.
	  • Transportation; electric cars, hydrogean
	• Possibly including initiatives to store hydro power via hydrogen, kinetic/flywheel, water storage etc.

Benefit Quantifi-cation	• Significantly reduce the ~$50M currently spent per year by Yukoners on imported fossil fuels, redirecting this money into a mix of Yukon electricity and savings for businesses/consumers • Protect Yukoners from global oil/gas prices increases and volatility since electricity prices are likely to be more stable • Significantly reduce CO2 emissions

Who would be involved/ key partners?	Key issues and potential solutions	Government support and/or funding required	Key fact gaps/ priority research issues and next steps

Core partners: generation, distribution, pricing/regulation
  • Yukon Energy Corporation
  • Yukon Electrical Company Limited
  • Utilities Board
• Insurance companies
• City of Whitehorse
• First Nations
• Yukon Government/Energy Solutions Centre
• Water Boaard
• Industry
• Public
• Yukon Agriculture Association
	• Capital cost
	• Administration
	• Those affected by changing water levels – e.g. Marsh Lake
	• Land rights
	• Environmental issues
	• Technology constraints
	• Regulatory
	• Income levels
	• Education
	• Possible requirement for more generation capacity in 10+ years, especially if current surplus is directed to industrial users
		• Subsidies for smart meters
		• Supply land/permitting for water storage
		• Public private partnerships: risk sharing
		• Direction to the utilities by the Utilities Board
		• Hydrogen user
			• See above

Overall Conclusion	• Program has strong potential and should be considered strongly as an option for a Yukon energy strategy

Next steps on the Yukon Energy Strategy after this workshop

- Distribute a report on the workshop outcomes
- Prepare a Draft Energy Strategy – Winter 2007/08
- Public consultation on the Draft Strategy – Spring 2008
- Revise the Draft to reflect public input – Summer 2008
- Public release of the Energy Strategy – Fall 2008
- Begin implementation of priority action items – Fall 2008