

Carbon Neutral Kootenays

Local Governments And First Nations Reducing Emissions

Climate Change 101

Nelson

June 24, 2009

Project delivered by:



The Path to Carbon Neutral: Measure - Act - Lead

Agenda

10:00 Opening Remarks

Introductions

Carbon Neutral Kootenays Project

BREAK

What is Carbon Neutral

Action - Context

12:00 LUNCH

Action – Examples

Offsets

BREAK

Communicating Climate Action

4:00 Wrap-up



Themes

- We're all in this together
- Each community is unique
- Start now
- Innovation
- Reduce waste
- Legacy and leadership

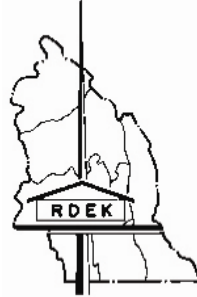


	Greenhouse Gas Reduction Targets Act	Targets, Policies and Actions (Bill27)	Climate Action Charter
Purpose	Legal requirement for province of BC to meet emission reduction targets	To encourage communities to establish targets and develop policies and actions contributing to GHG reductions	To identify the shared commitment that local governments have to addressing climate change
In Legislation	Yes	Yes	No
Voluntary	No	No	Yes
GHG emission reductions targeted	Requires Province-wide greenhouse gas reduction from 2007 levels of: 6% by 2012, 18% by 2016, 33% by 2020, 80% by 2050	Reduce community-wide emissions through planning	Reduce emissions from corporate and community-wide operations
Activities	None for local governments	Set targets in OCP's, and define actions	Measure and report corporate operations emissions. Be carbon neutral and develop compact communities
Dates to meet	None for local governments	OCP's May 31 2010 RGSs May 31 2011	2012
Funding Attached	No	No	Signatories receive Carbon Tax rebate (CARIP grants).

Introductions

- Name, Title, Local government
- How is your local government engaging on climate change
- What you want to get out of today





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Thanks to...

- Regional Boards of:

East Kootenay

Kootenay Boundary

Central Kootenay

for approving this project a new approach in how we, as the Kootenay Region of British Columbia, solve region-wide issues.

- Board of Directors of the **Columbia Basin Trust** and the leadership of Neil Muth and Kindy Gosal in securing the involvement of the Columbia Basin Trust.
- Delivery agents

Project delivered by:



Carbon Neutral Kootenays Project

- Local Gov't and First Nation Operations
 - Outreach activities for boards and councils
 - Capacity building for staff
 - Unique model of multi-government project
-
- **Time and \$ efficient way to complete inventories and plans for 29 + communities / RDs**



Not to be confused with...

- Community climate change adaptation
- Community energy and emissions inventories completed by Province of BC
- OCP or RGS emissions reduction targets

Project Deliverables

- Inventory of energy use
- Carbon footprints
- Action plans for each Regional District
- Implementation Plans
- Build capacity in local governments

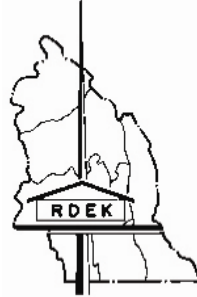
Project Timelines (2009)

- Survey of communities March
- Inventory data collection April to August
- Climate 101 sessions May – June
- Inventory learning sessions June
- Regional district action plans June – Sept
- Implementation and offset opportunities Fall
- Plan finalization Fall

This Project is the 1st Step

This Project			
2009	2010	2011	2012
<ul style="list-style-type: none"> •Inventory •RD Action plans •Municipal action templates •Capacity •Investigation of potential for a Kootenays offset strategy and implementation collaboration 	<ul style="list-style-type: none"> •Municipalities and first nations develop and implement carbon neutral action plans •Regional Districts implement the Regional District action plans developed in 2009 		<ul style="list-style-type: none"> •Local governments are carbon neutral in their own operations (as per climate action charter) •Continued work on reducing emissions





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Carbon Neutral

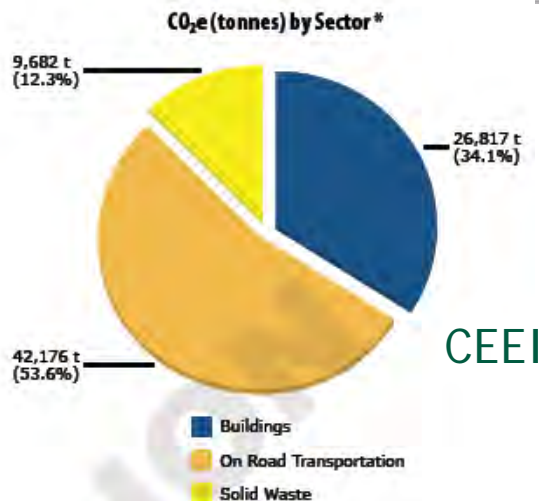
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Two categories of energy use and emissions

Community



Local government corporate operations



Main emissions from local government operations



Buildings
35%-65%

Fleets
20%-50%



Waste collection & diversion ~ 10%



Water & infr ~ 5%



Meaning of “Carbon Neutral”

0

Not % reduction based on current emissions – 100% reduction regardless of where you start → no reason to wait

Net

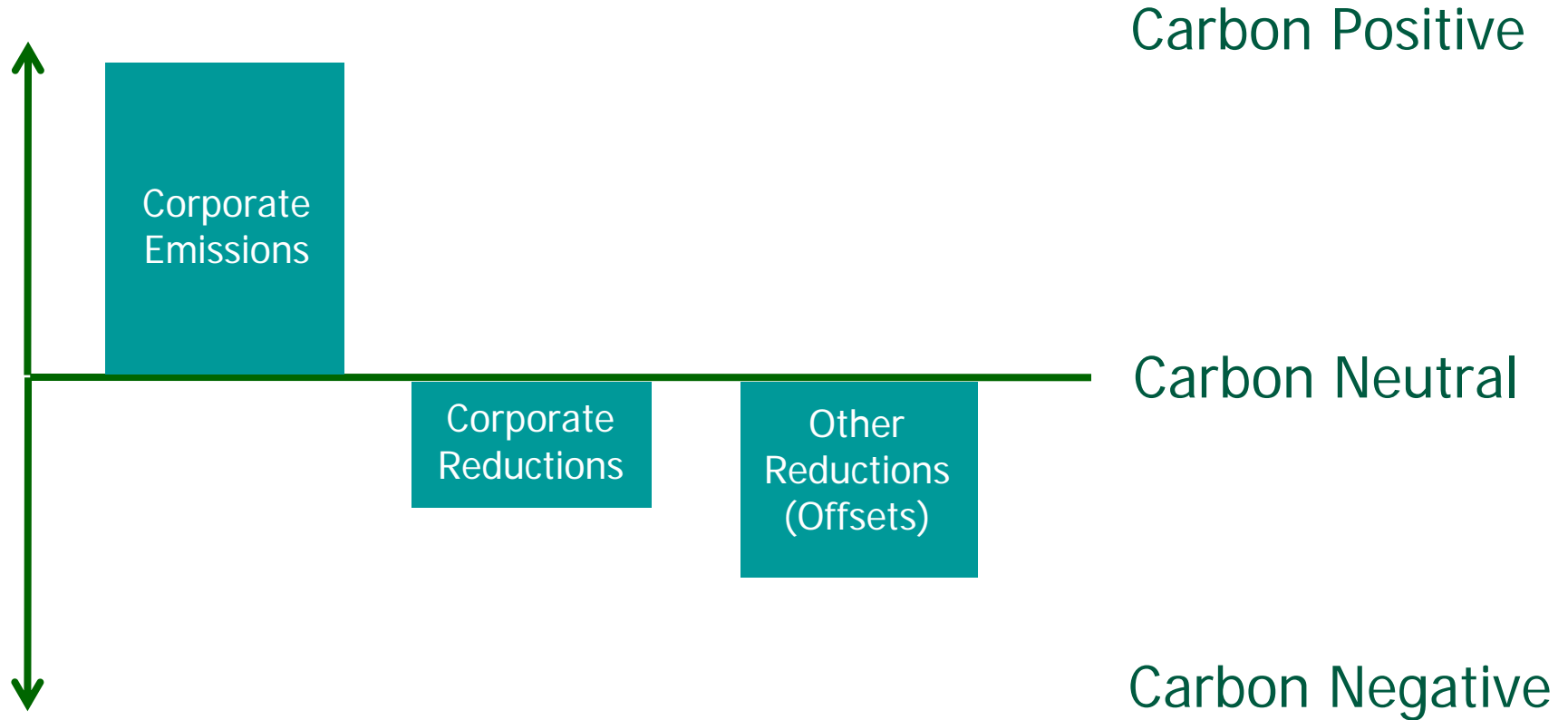
You might not be able to get off of gasoline, diesel and natural gas right away, but you can take responsibility for those emissions through offsets.

GHG's

Gasses that warm the planet through trapping the sun's heat like a greenhouse – primarily from burning fossil fuels



Carbon Neutral



$$\text{Emissions} + \text{Reductions} + \text{Offsets} = 0$$



Carbon neutral A-B-C's

A: Measure local government emissions

B: Act to reduce these emissions as much as possible

C: Lead by taking responsibility for your remaining emissions by investing in projects that reduce emissions equivalent to your remaining emissions in 2012, by purchasing offsets

What to measure

- Transportation
- Heating
- Electricity use
- Traditional services:
 - Fire
 - Solid waste collection & diversion
 - Arts, recreation, culture
 - Road & traffic operations
 - Wastewater, stormwater, drinking water
 - Governance, admin, planning

Measuring up your carbon from major sources

Buildings

- Natural gas X emission factor = GHG's
- Fuel oil X emission factor = GHG's
- Electricity X emission factor = GHG's

Fleet

- Gasoline X emission factor = GHG's
- Diesel X emission factor = GHG's

Total emissions = # t CO₂e

Units of Energy

- Natural Gas: gigajoule (GJ - or one billion joules)
- Electricity: kilowatt-hour (kWh – 1000 watts for an hour)
- Gasoline, Diesel: Litres (L)

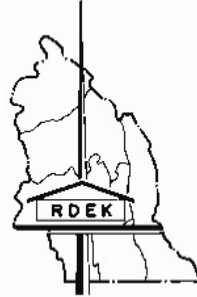
- One GJ is about the same energy as:
 - natural gas for 3-4 days of household heating, or
 - 26 - 27 litres of diesel or gasoline (a tank of gas), or
 - Two 20 lb propane tanks (a summer of barbeque), or
 - 300 kWh (electricity used by a typical house in ten days), or
 - 1/6 th of a barrel of oil
 - 3000 hours of hard physical labour

DISCUSSION

DULLBERT



For those communities that have completed inventories, what advice can you share about completing and maintaining inventories?



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Choosing to Act

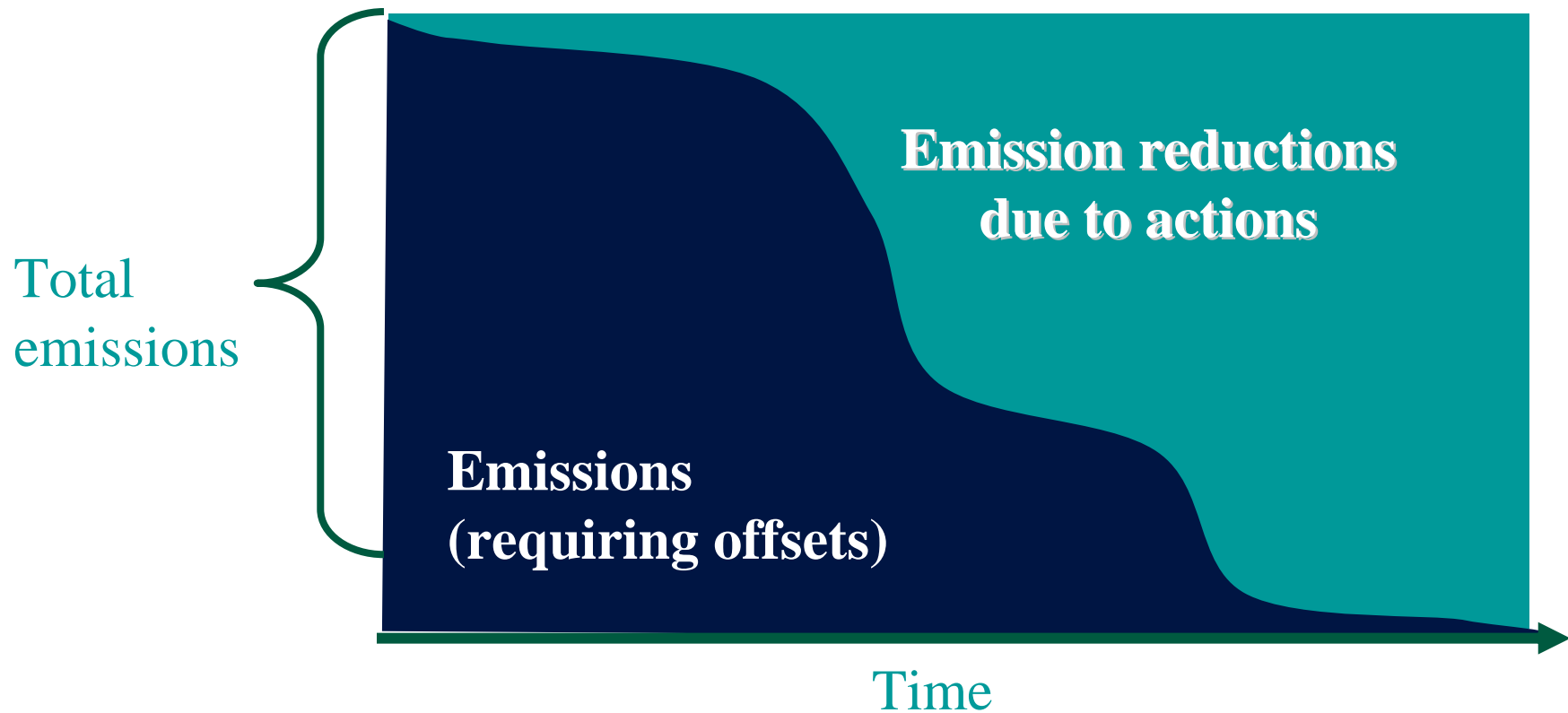
	Town 1	Town 2	Town 3	Town 4
Climate Action Charter Signed	no	yes	yes	yes
Community GHG targets	no	no	yes	yes
Corporate actions	no	yes	no	yes
Access to provincial grants	<	-	>	>>
Carbon tax rebate	-	\$	\$	\$
Offset cost	-	\$	\$\$	\$
Energy cost savings	-	\$\$	-	\$\$
Viewed as leaders	<	-	-	>>



Carbon neutral over time

Example for a hypothetical community.....

.... a combination of reductions and offsets makes the operations 'carbon neutral'



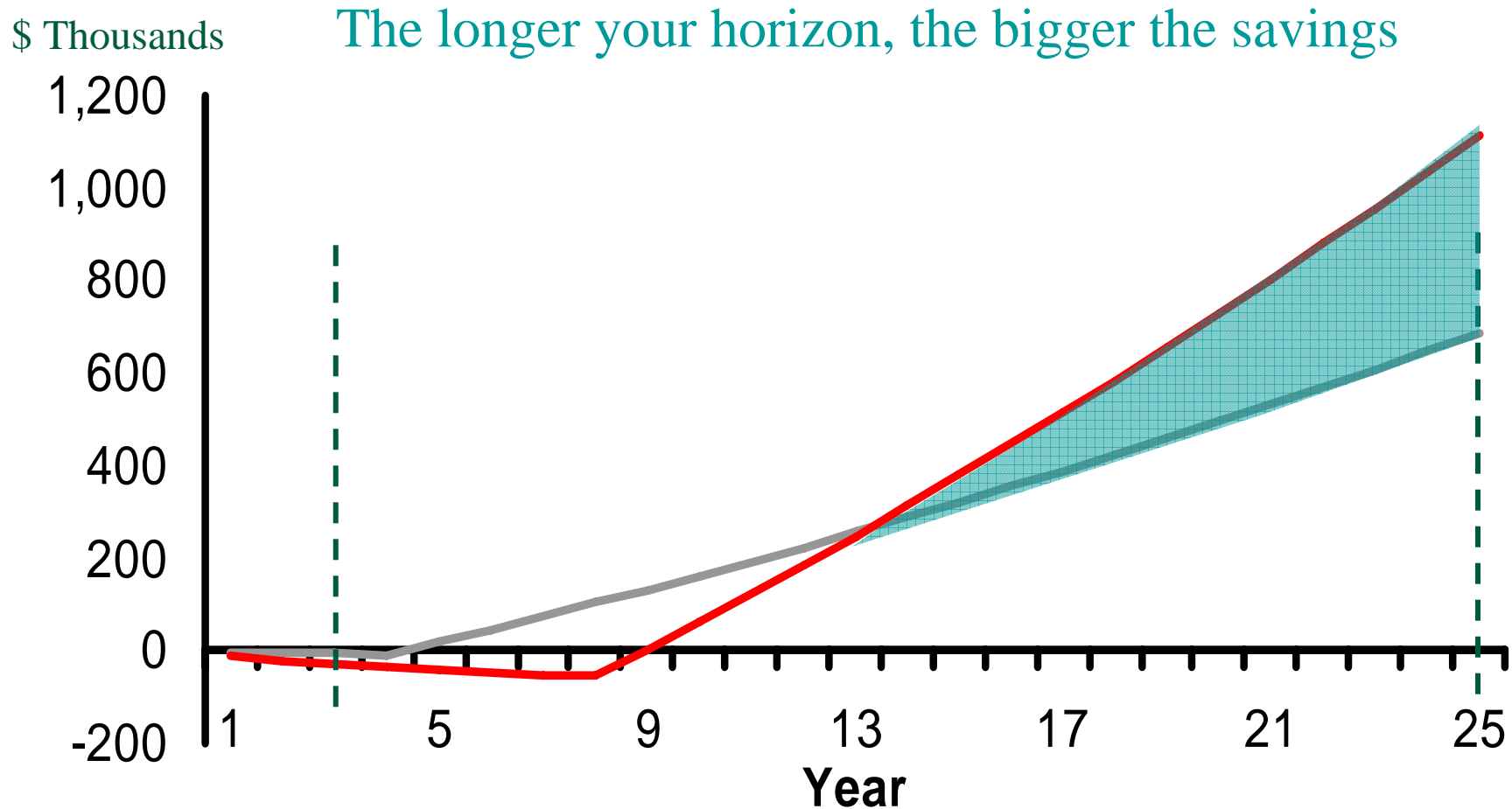
Start now

- No reason to wait:
 - Not % reduction of current emissions
 - Not dependent on a previous 'baseline year'
 - Not 'cap & trade' based on a starting point
- Rather zero net emissions in 2012
 - All remaining emissions in 2012 are offset, regardless of starting point
- Reductions are \$energy and \$offset savings, forever
- Set up ongoing ghg accounting processes to maintain inventory

Action Sequence

- Match the energy need
 - Don't heat and cool when you don't need to
 - Expand comfort zones / thermostat settings
- Maximize Efficiency
 - Operate and maintain equipment properly
 - Fix stuff that is broken
 - Retrofit on-site equipment to be more efficient
 - Stop heat loss (pool covers, insulation, ...)
- Optimize Energy Source
 - Convert to renewable heating and cooling
 - Use lowest quality energy source that can do the job

Different timeframe ... different decisions



Measure over life of asset, not term of council

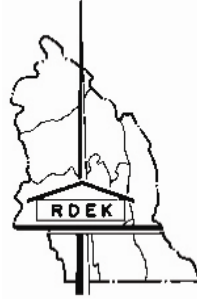
Action Plan Opportunities

- Energy efficiency for buildings:
 - e.g. LEED Gold standards
- Renewable energy for buildings:
 - e.g. solar & ground-source for pools
 - Heat recovery: from wastewater treatment, sewer, rinks
- E3 Fleet
- District energy anchor
- Sewer gas utilization
- Green fleet & purchasing
- NB: Landfills handled separately



LUNCH





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Action - Examples

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Current Kootenay Climate Actions

- Studies and Audits
 - Building energy audits – Lighting, HVAC
 - Renewable energy feasibility studies – Solar Hot Water, Ground Source
- Planning
 - Energy Plans, Corporate Climate Plan, ICSP, OCP
- Buildings
 - HVAC Retrofits
 - Ground Source Heating
 - Pools and Rinks
 - Lighting and Electrical



Current Kootenay Climate Actions

- Fleet
 - Biodiesel
 - Idle free
 - Right sizing
 - Hybrids
 - E3
- Political
 - Council Committees
 - Staff awareness
 - Task forces



Current Kootenays Climate Actions

Organization Name	studies	plans	buildings	fleet	political
Canal Flats	heat pumps				
City of Castlegar	energy audit	ICSP	City hall		council green ctee
City of Cranbrook			retrofit old boilers		
City of Fernie			Rink	biodiesel, idle free, hybrids	
City of Grand Forks		energy plan	retrofits		
City of Greenwood	pool solar		retrofits	replaced truck	
City of Kimberley	CBT Adaptation		green bldg initiative	anti-idling	
City of Nelson		corp. climate plan			
City of Revelstoke			pool	lower emissions	
City of Rossland				sandtrucks	
City of Trail			pool	rationalization	staff awareness
District of Elkford	CAEE	OCP	GSHP	E3	
District of Invermere				review, anti-idling	
District of Sparwood	TNS		rec center	agrobiodeisel	
East Kootenay			retrofits	rightsizing fleet	
Kootenay-Boundary			curling rink, others		
Town of Creston	energy audit	Downtown Plan			
Town of Golden			LEED campground, retrofits		
Village of Fruitvale				rightsizing fleet	
Village of Kaslo			geo @ city hall		
Village of Midway	energy audit				
Village of Montrose			retrofits		
Village of Nakusp			arena, water		
Village of New Denver			grant for geo @ office		
Village of Salmo			retrofits, leed silver new		
Village of Silverton			retrofits		
Village of Slocan	energy audit		office		

Castlegar: \$275,000 20-year NPV, 5-year payback

Building	First Round Recommendations	First Round Savings			
		Electricity	Gas	GHG	Financial
City Hall	Manage lighting, optimize GSHP, fans, pumps	15%	0%	0.2	\$3,000
Fire Hall	None now, but consider air source heat pump in future – possible 80% gas savings, but no financial savings	0%	0%	0.0	-
Civic Works	Lighting, occupant controls	15%	10%	3.4	\$2,000
RCMP Building	Lighting, fix heater, reduce fans, occupant controls – consider heat pumps in future (possible 80% gas savings)	15%	10%	4.0	\$3,000
Public Library	Lighting, consider heat pumps in future (possible 50% gas savings)	25%	0%	0.2	\$2,000
Station Museum	Lighting	20%	0%	0.0	-
Kootenay Gallery	Lighting, some occupant controls	15%	10%	0.8	\$1,000
Treatment Plant	Optimize equipment	12%	0%	0.8	\$9,000
Meadowlark	Pump optimization potential, but current usage is unavailable	-	-	-	-
Brandson Shop	Lighting, heating set-back, consider insulation	75%	40%	3.7	\$1,000
Zuckerberg	Adjust heating, lighting	40%	0%	0.0	\$1,000
Total		14%	8%	13.2	\$21,000

Building Energy Efficiency Retrofits

- City of Burnaby
 - ESCO contract with Honeywell
 - 49 municipal buildings
 - \$5.6M capital cost, \$450,000 annual savings
 - Improvements to ice conditions
- District of Saanich
 - ESCO contract with MCW
 - 10 buildings, 500,000 ft²
 - \$857,000 capital cost, \$83,000 annual savings



Energy Service Companies will pay for your capital cost



Municipal Buildings

Richmond	Saanich	White Rock
<ul style="list-style-type: none"> • Sustainable High Performance Building Policy 	<ul style="list-style-type: none"> • Energy performance contract – guaranteed savings 	<ul style="list-style-type: none"> • LEED Gold certification
<ul style="list-style-type: none"> • Projects will be evaluated based on life cycle costing • LEED Gold for buildings >2000 m² • LEED Silver for buildings < 2000 m² 	<ul style="list-style-type: none"> • 10 municipal buildings • Lighting, mechanical and water • \$90,000 in annual savings 	<ul style="list-style-type: none"> • Solar hot water and space heating • Solar PV provide 5% of electricity requirements • Green power purchase for remainder



District Heating Revelstoke

- First renewable-energy district heating system in BC, burning wood waste from local mill
- Hot water heating to downtown buildings, steam for kilns
 - Reduced use of silo burner
 - Lower energy costs for customers
 - City is a partner in Revelstoke Energy Corp.



Wastewater Heat Recovery Kelowna

- Wastewater treatment plant discharge used as low temperature heat source
- Heat recovered using heat pumps
- Used as first stage of heating for Okanagan College



Sun Rivers Geothermal Community

- 2000 home development in Kamloops
- Each home has a closed ground loop
- Ground loops installed and paid for by Corix Utilities, leased back to homeowner
- Homeowner responsible for systems within the house



Solar Hot Water Dawson Creek

- Solar water heating in three municipal buildings
- Partnership with BCSEA for promotion and education about solar water heating
 - Solar water heating curriculum introduced at Northern Lights College
 - Developing a model bylaw to require “solar ready” new homes



Landfill Gas Utilization Hartland

- 1.6 MW green power generation
- Privately built by Maxim Power
- 12,274 MWh electricity generated
- \$250,000/year royalty to Capital Regional District
- Can we capture more?



Taking action – Operations-level

Rec Centers

Port Coquitlam & Oak Bay – Solar hot water on rec centre
Salmon Arm – Rec centre energy savings & ground-source heat
Houston – Geo for pool and rinks, Energy Center of the North
Richmond – skating oval

Municipal Buildings

Dawson Creek – Solar hot water on three municipal buildings
Richmond – Firehalls
Township of Langley – green civic center, E3 Fleet, BC Biofleet
City of North Vancouver – new energy efficient library with large solar hot water system on roof for LEC
White Rock – LEEDTM Gold operations building

Other

Kelowna – Landfill gas power; solar PV street lights; hybrid buses
Lake Country & West Van – Electrical generation from water supply
CRD – Landfill gas 1.6 MW green power
Saanich – carbon neutral fund
Whistler – targets, performance objectives, tied to budgeting, analysis by dept and facility
Burnaby – EnergyFit program

Municipal Operations

BC Biofleet - Fleet Challenge BC

- Based on success of pilot project
 - Several municipalities
 - Will purchase 80 million litres of biodiesel over 5 years
 - Biodiesel cost can be same or less than regular diesel



- BC Transit switching to 5% biodiesel blend for all Victoria Regional Transit System vehicles

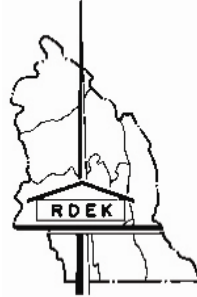


EXERSIZE

Use yellow stickies to

- List actions that your local government could take to reduce energy and emissions in its own operations
- Put them up on the wall





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Local Governments And First Nations Reducing Emissions

Offsets

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Offsets For the Emissions You Can't Eliminate Yet

A **GHG offset** is generated by the:

- reduction
- avoidance
- or sequestration

of GHG emissions from a specific project

Pacific Carbon Trust

- One option for local governments
- Money invested in trust will be reinvested in made-in-B.C. carbon offset projects
- Projects may include:
 - Enhanced energy efficiency
 - Clean, renewable energy
 - Incremental afforestation measures



Eligibility of Offsets

- Eligibility would be evaluated on the basis of consistency with ***all*** of the following criteria:
 - Within scope;
 - Real;
 - Measurable;
 - Additional;
 - Verifiable;
 - Counted once; and
 - Clear ownership.

How much will offsets cost?

- No one knows 2012 carbon price
- Province currently pays \$25/tonne to Pacific Carbon Trust to offset travel
- Most local governments just received Climate Action Revenue Incentive Program (CARIP) grant, based on c-tax of \$10/t
- Back-of-envelope offset cost est: multiply CARIP grant by 5
 - Assuming no emission reductions before 2012
 - Note: very rough calculation, but indicative

Estimates from CARIP

Local Government	2008 CARIP (6 mo)	12-mo. Est	ghg tonnes	offset exposure
Canal Flats	\$ 298	\$ 596	60	\$ 1,490
Castlegar	\$ 1,743	\$ 3,486	349	\$ 8,715
Central Kootenay (RD)	\$ 10,580	\$ 21,160	2,116	\$ 52,900
Cranbrook	\$ 10,205	\$ 20,410	2,041	\$ 51,025
Creston	\$ 1,182	\$ 2,364	236	\$ 5,910
East Kootenay (RD)	\$ 696	\$ 1,392	139	\$ 3,480
Elkford	\$ 3,531	\$ 7,062	706	\$ 17,655
Fernie	\$ 4,573	\$ 9,146	915	\$ 22,865
Fruitvale	\$ 611	\$ 1,222	122	\$ 3,055
Grand Forks	\$ 1,453	\$ 2,906	291	\$ 7,265
Greenwood	\$ 487	\$ 974	97	\$ 2,435
Invermere	\$ 1,348	\$ 2,696	270	\$ 6,740
Kaslo	\$ 327	\$ 654	65	\$ 1,635
Kimberley	\$ 5,469	\$ 10,938	1,094	\$ 27,345
Kootenay-Boundary (RD)	\$ 429	\$ 858	86	\$ 2,145
Midway	\$ 192	\$ 384	38	\$ 960
Montrose	\$ 303	\$ 606	61	\$ 1,515
Nakusp	\$ 1,293	\$ 2,586	259	\$ 6,465
Nelson	\$ 2,243	\$ 4,486	449	\$ 11,215
New Denver	\$ 121	\$ 242	24	\$ 605
Radium Hot Springs	\$ 370	\$ 740	74	\$ 1,850
Rossland	\$ 1,950	\$ 3,900	390	\$ 9,750
Salmo	\$ 241	\$ 482	48	\$ 1,205
Silverton		\$ -	-	\$ -
Slocan	\$ 127	\$ 254	25	\$ 635
Sparwood	\$ 3,363	\$ 6,726	673	\$ 16,815
Trail	\$ 7,111	\$ 14,222	1,422	\$ 35,555
Warfield	\$ 521	\$ 1,042	104	\$ 2,605
TOTAL	\$ 60,767	\$ 121,534	12,153	\$ 303,835

What about long term offset costs?

- Carbon price likely to increase over time due to supply and demand
- All provincial operations carbon neutral by 2010 including Ministries, schools, universities, health authorities, crown corporations.... = high demand
- Least expensive projects will be completed first
- Relying too heavily on offsets leaves you exposed to financial risk

Funding – Other than Offsets

Funding

- Provincial grants
 - Community Action on Energy and Emissions
 - Infrastructure planning grants
 - Strategic Community Investment Fund
 - Towns for tomorrow
 - Local motion
- Green Municipal Funds (FCM)
- Energy service companies (e.g. Corix, Terasen)
- Municipal Finance Authority

Energy & emissions funding guide

- For BC local governments
- Updated quarterly, available on CEA website



Funding Your Community Energy & Climate Change Initiatives

A guide to funding and resources
for British Columbia local governments

January 2008

 Community Energy
Association
www.communityenergy.bc.ca
Helping communities benefit from energy opportunities



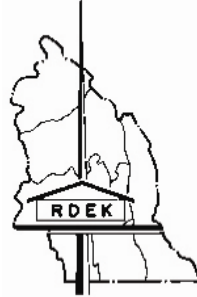
DISCUSSION

- What offset opportunities are there in the Kootenays?



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Communicating Climate Action

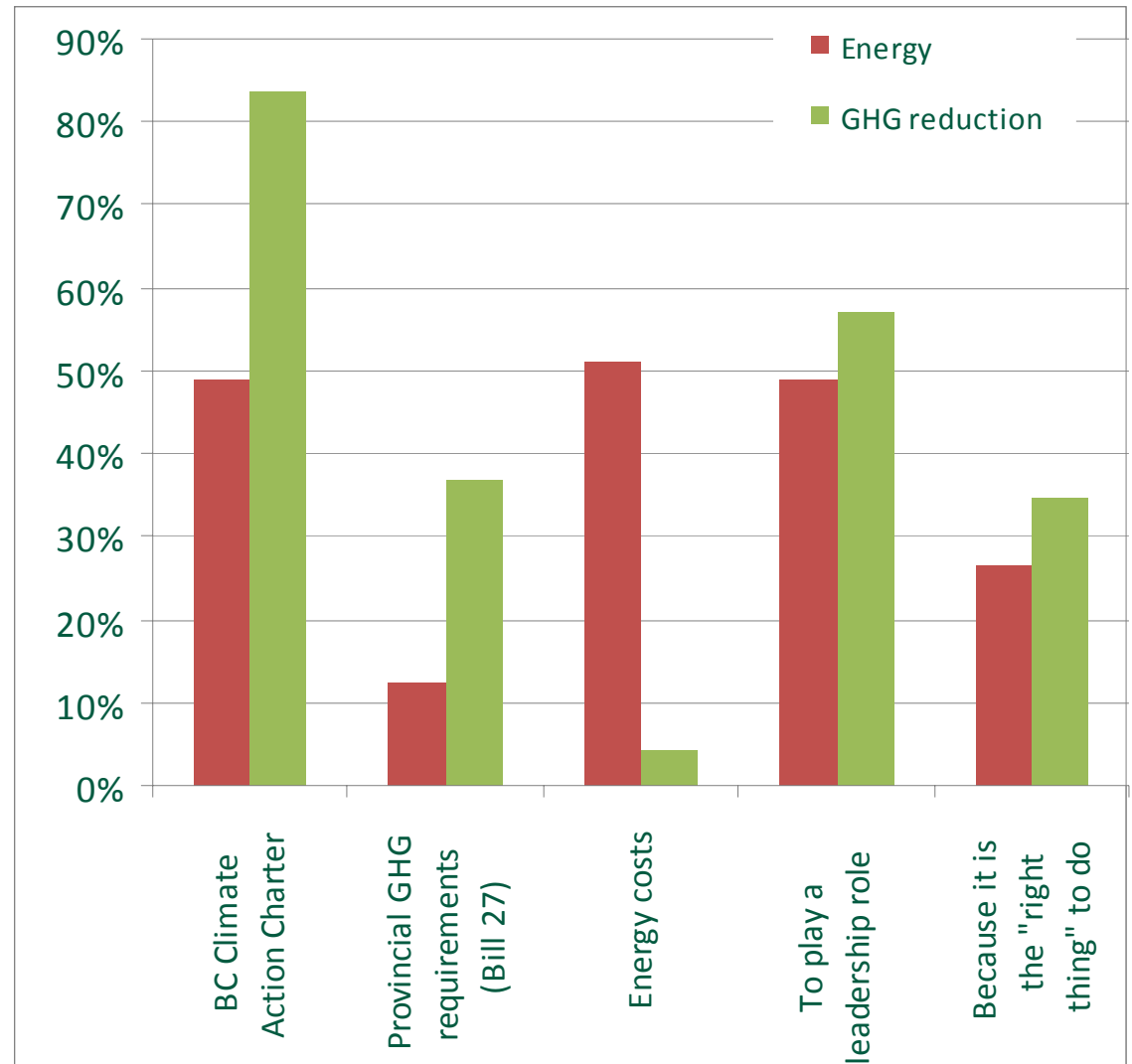
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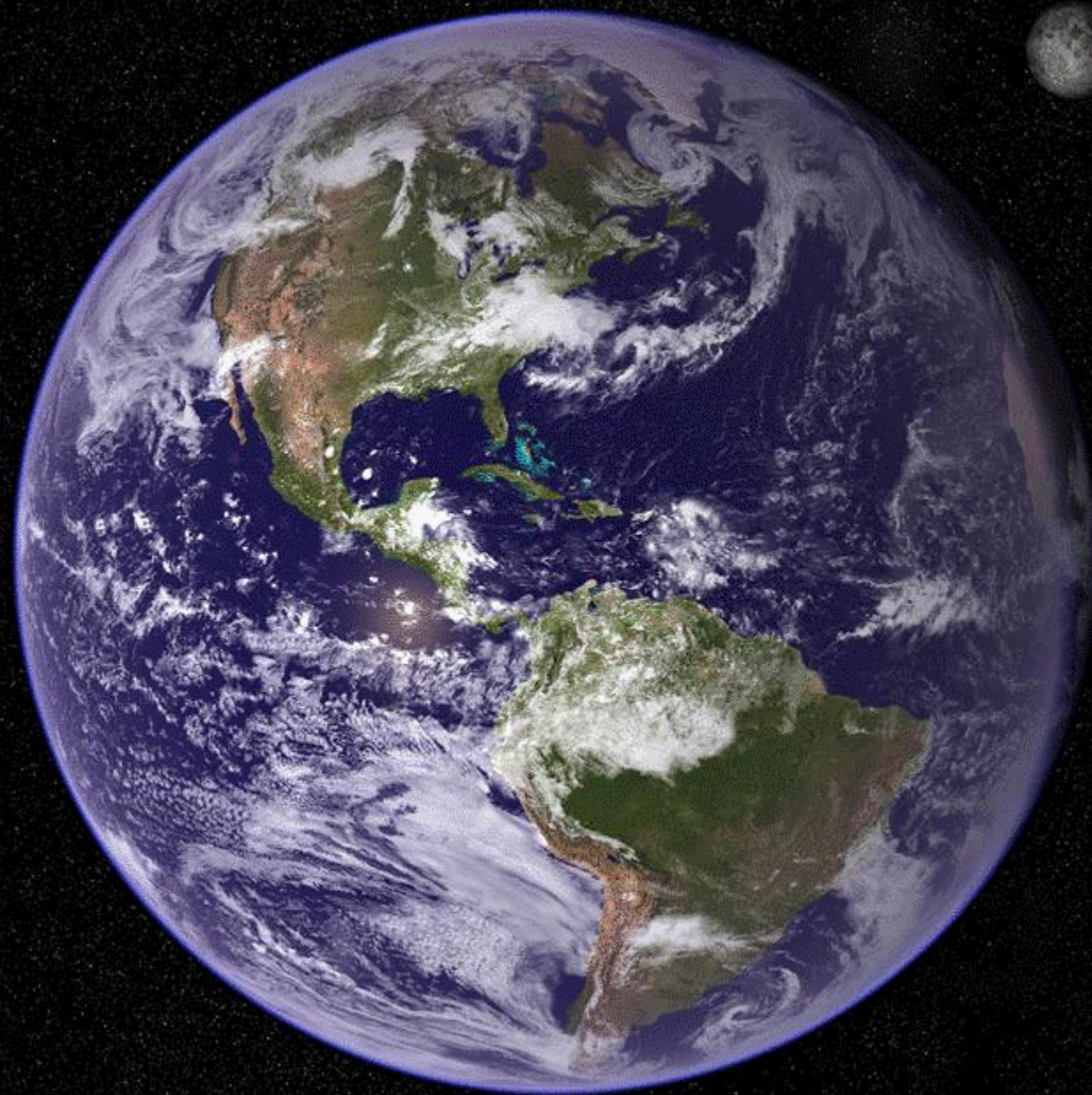
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Motivators for Climate Action in BC

- 2008 survey of BC local governments commissioned by Province of BC, conducted by CEA.
- 25% response rate across BC's 189 local governments.
- Top motivators for reducing energy and reducing ghg's are depicted at the side.



You are here

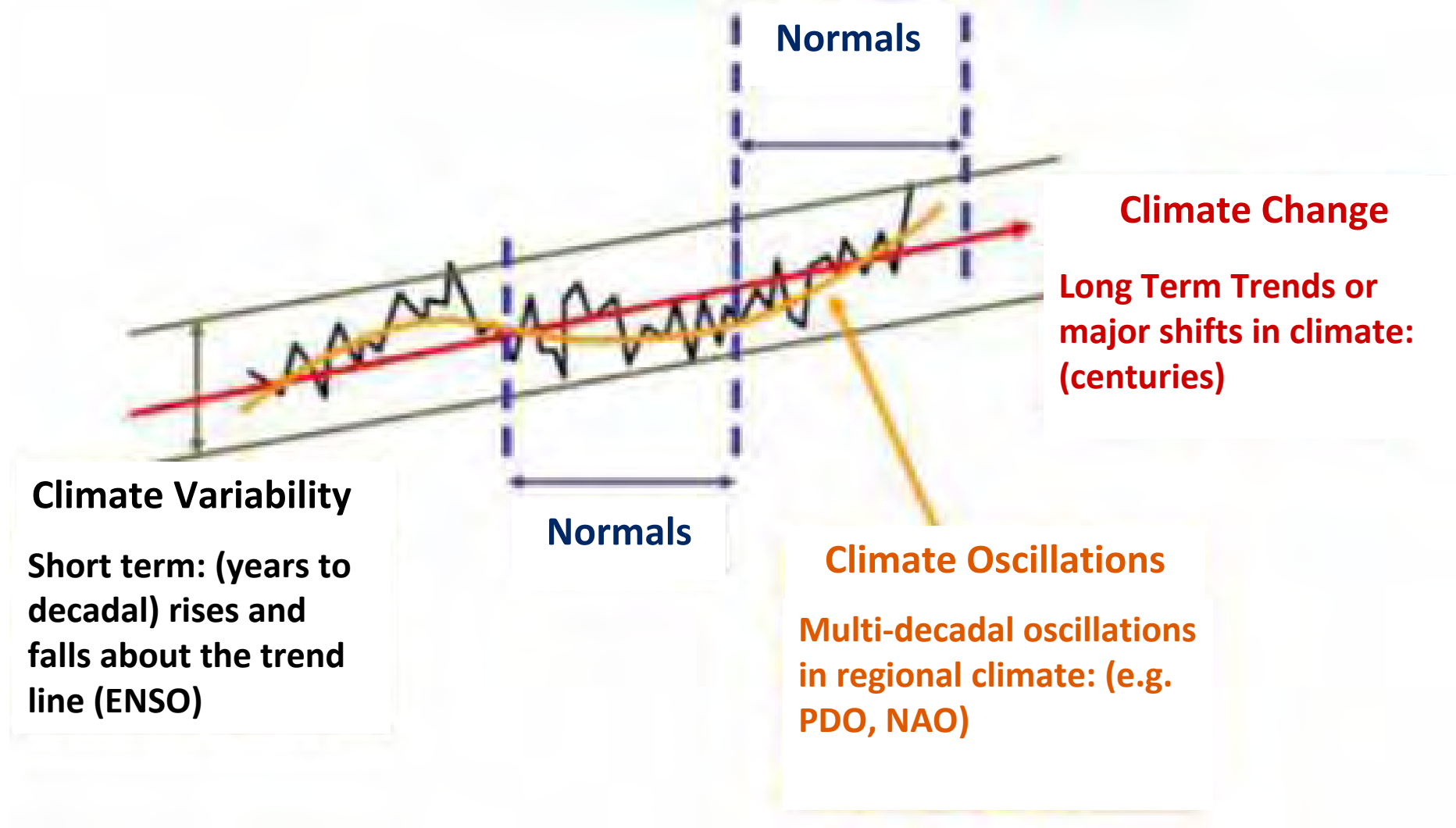


Greenhouse Gasses

- Carbon Dioxide otherwise known as CO₂ is the primary greenhouse gas, accounting for the majority of global warming and is also the most significant form of municipal emissions.
- Methane, Nitrogen oxide, and CFC's are also contributors.
- These gasses trap heat from the sun.
- They have a delicate balance in the atmosphere – too few and we freeze, but too many and we get too hot.



Climate Variability and Climate Change

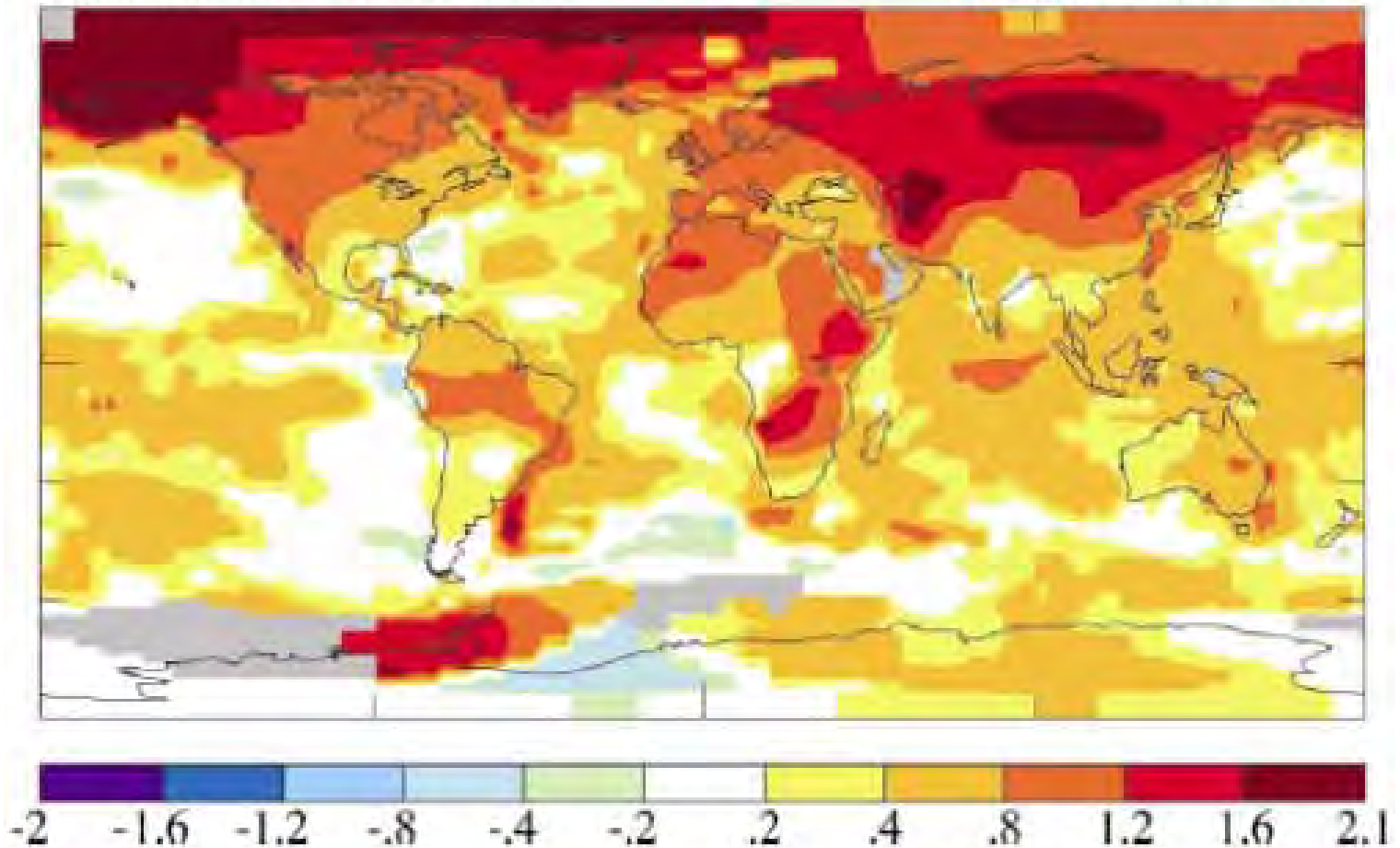


Warming doesn't happen equally everywhere

2001-2005 Mean Surface Temperature Anomaly (°C)

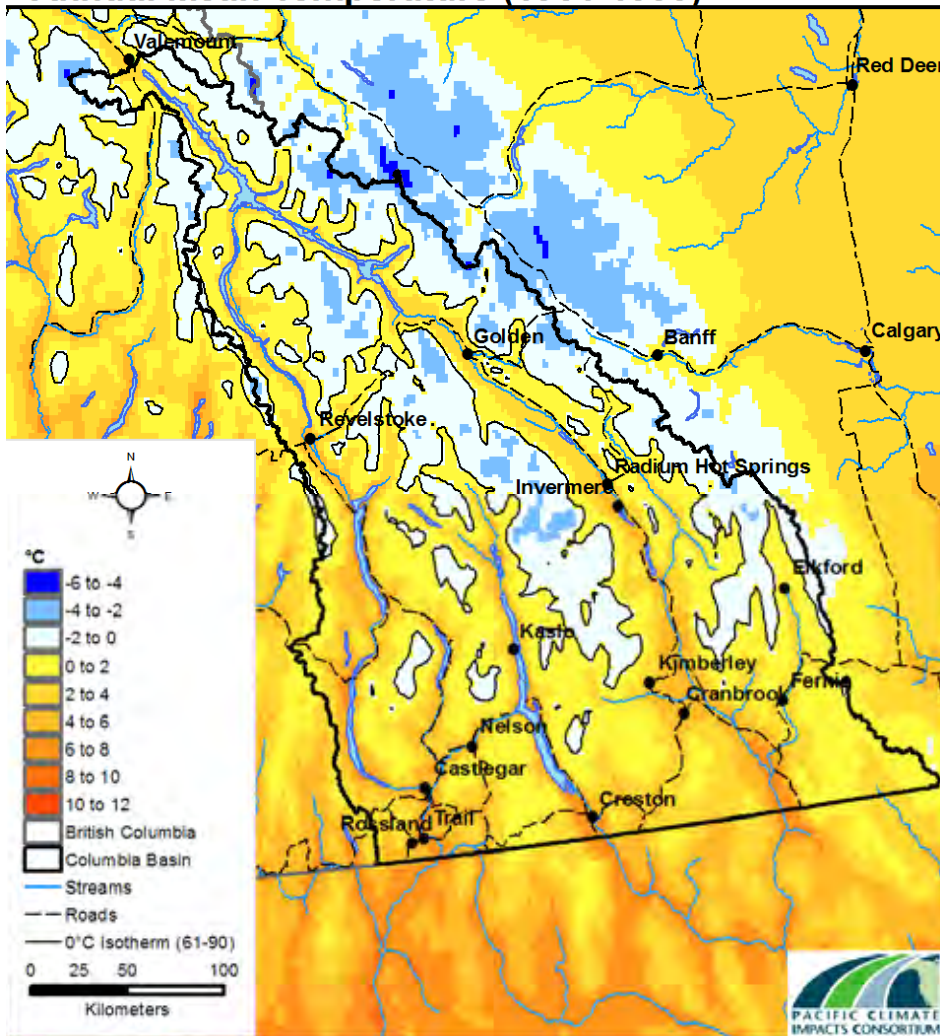
Base Period = 1951-1980

Global Mean = 0.53

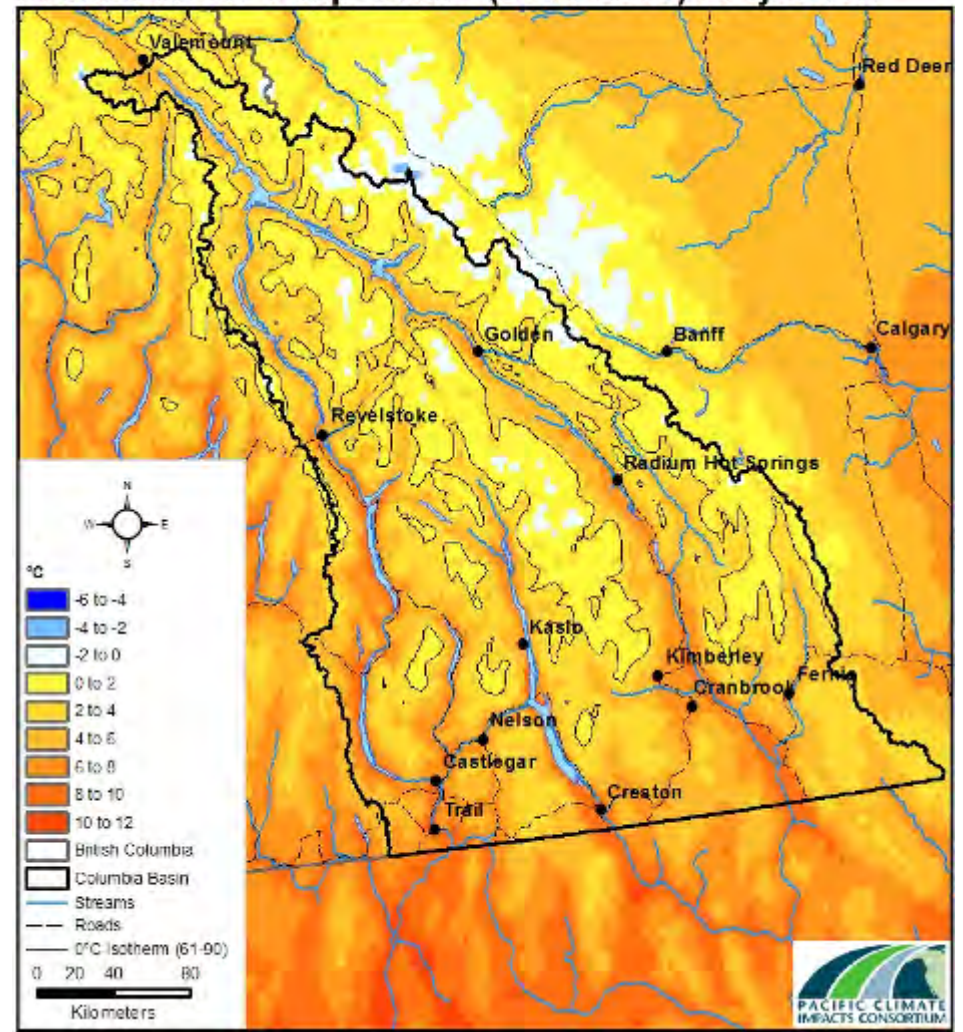


Temperature – Past and Future

Annual Mean Temperature (1961-1990)

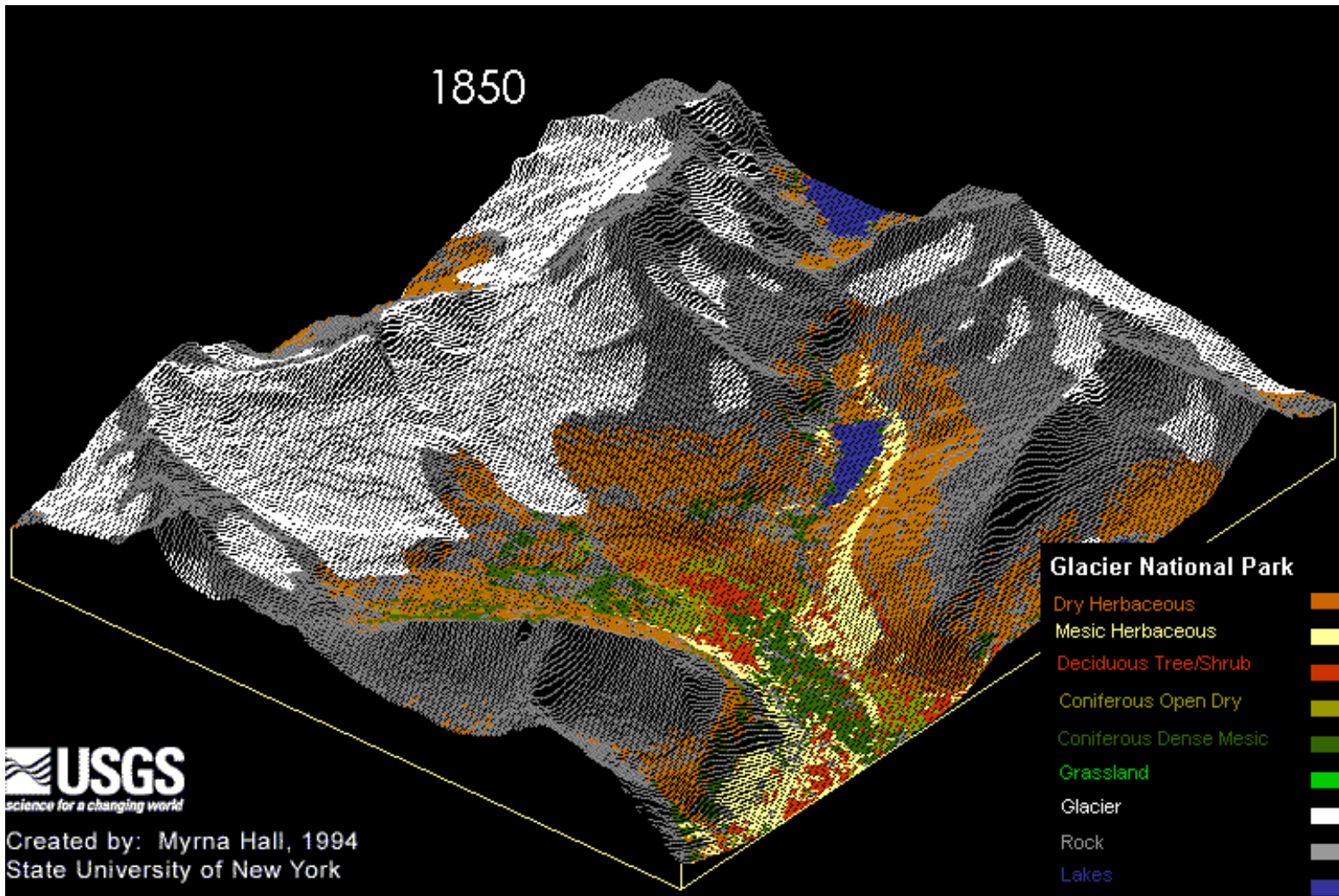


Annual Mean Temperature (2041-2070) Projection



Is 1 C warming important? Scenario of projected shifts in ecosystems in Glacier National Park

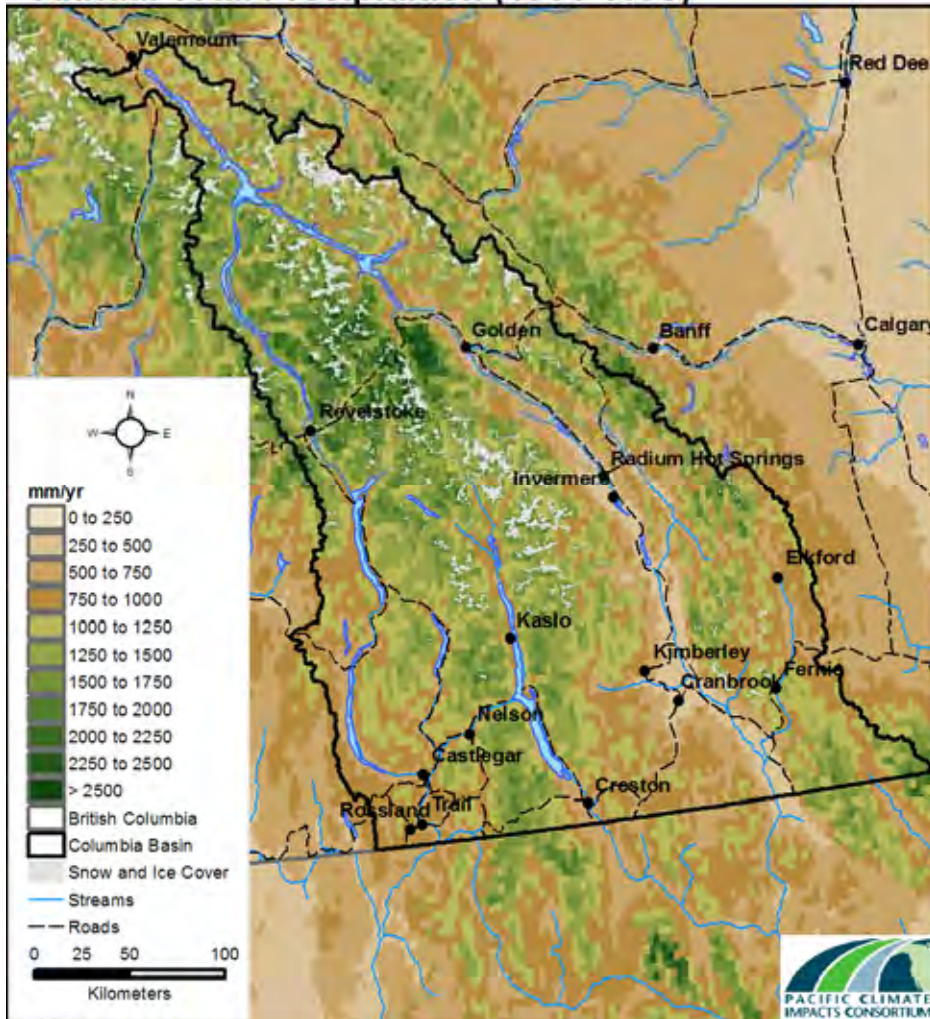
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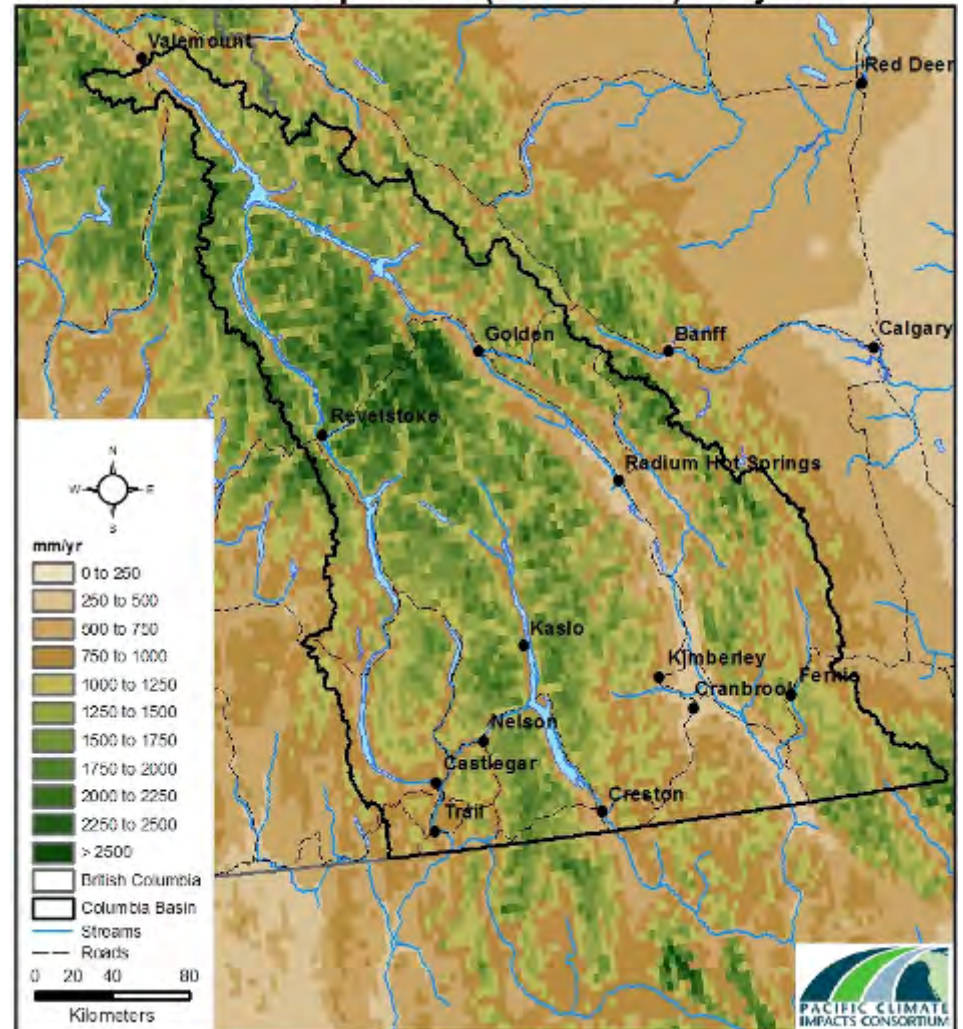
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http://www.nrmssc.usgs.gov/research/glacier_model.htm

Precipitation – Past and Future

Annual Total Precipitation (1961-1990)



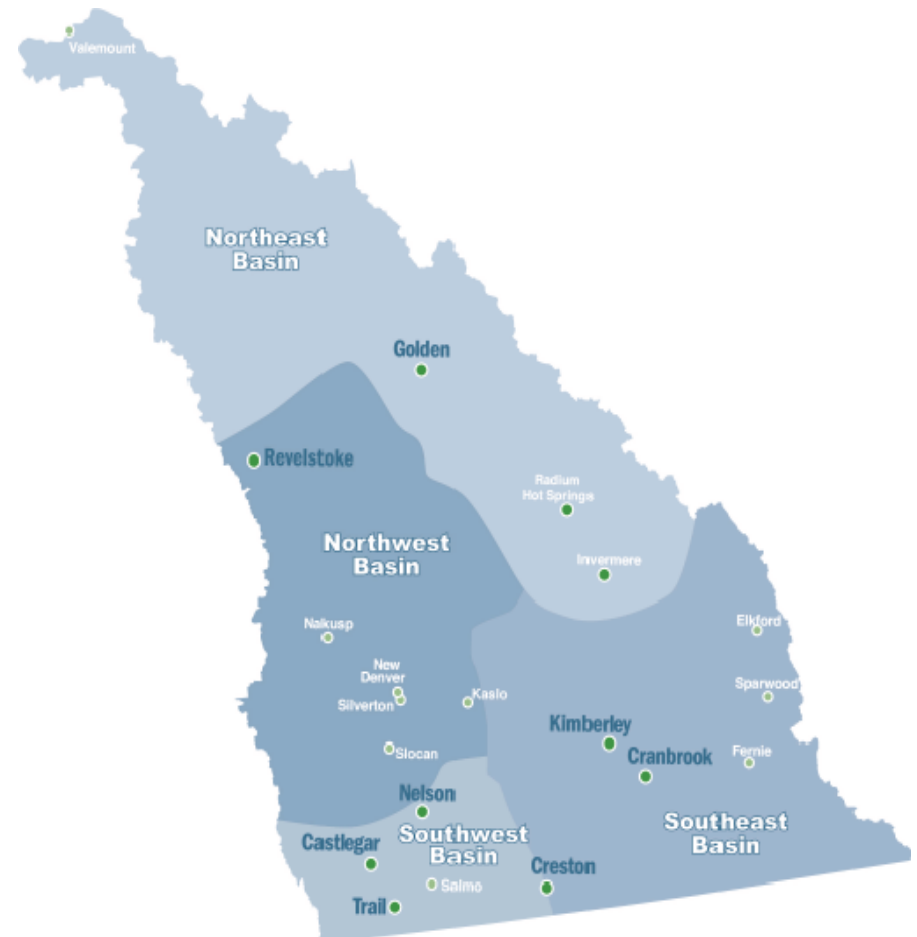
Annual Total Precipitation (2041-2070) Projection



Future climate will be different than the past

Global Climate Models - scenarios for Columbia Basin

- Warming is predicted through 21st century
- Increase average temp 2-3 degrees C by 2050s
- Increase in winter precipitation 1-13%
- Decrease in summer precipitation -4 to -10%



Impacts: Anticipate Changes

- Changes to temperature & precipitation can impact communities in a variety of ways
 - Impacts are direct or indirect effects of climate change on built or natural systems.
 - Impacts can be positive and negative.
 - Impacts can also be opportunities.

Current Impacts



Fires



Recreation Closure



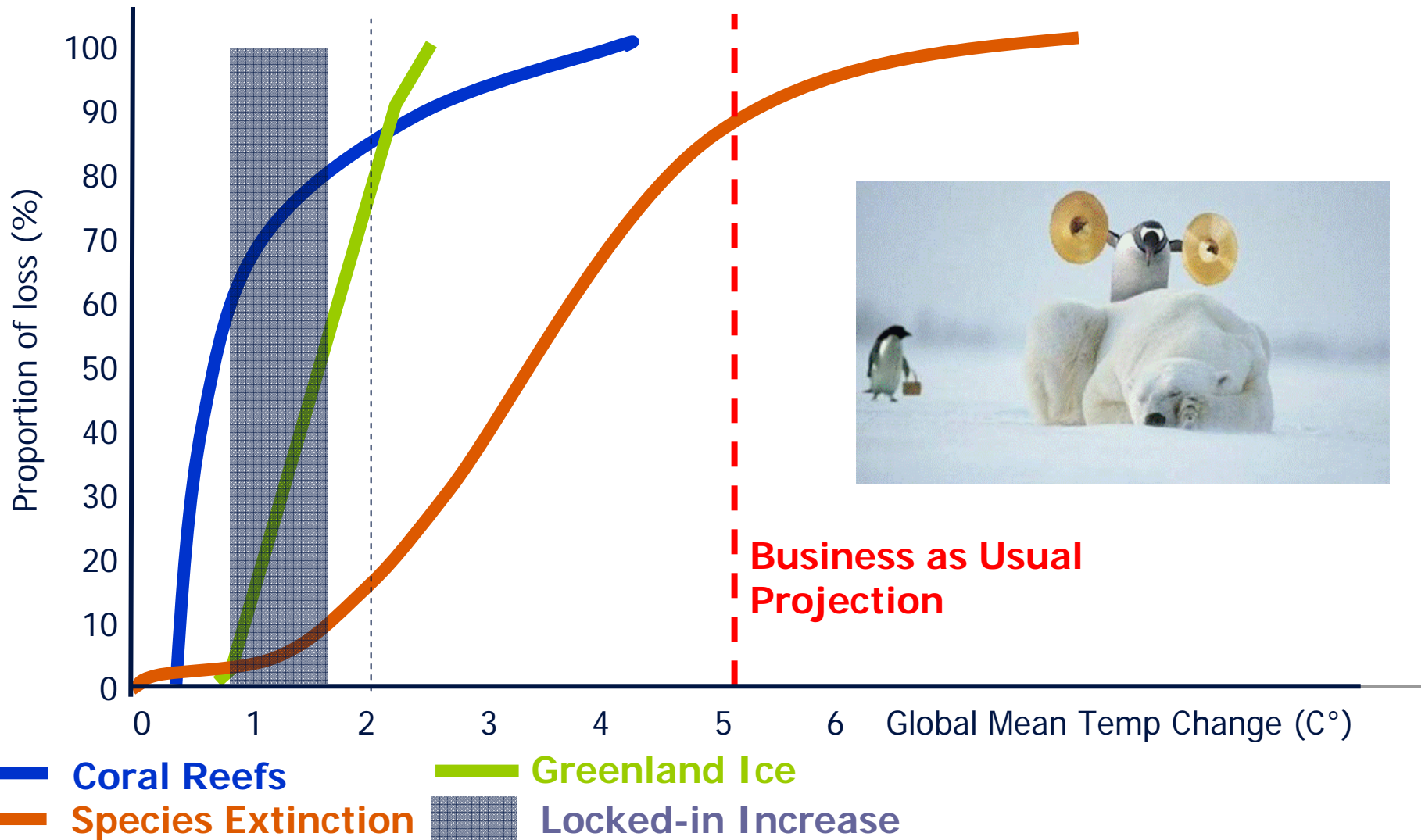
Pine Beetle



Recreation

What changes are you observing that may be related to Climate Change?

Global Impacts of Climate Change



Scientific Consensus

“The scientific evidence has now become overwhelming that human activities, especially the combustion of fossil fuels, are influencing the climate in ways that threaten the well-being and continued development of human society.”

Copenhagen Scientific Congress March 2009

- ≈ 2500 in attendance
- > 1400 scientific presentations
- Critically reviewed by independent researchers from:
 - University of California
 - University of Cambridge
 - University of Oxford
 - University of Copenhagen
 - Yale University
 - ETH Zurich
 - National University of Singapore
 - Peaking University
 - University of Tokyo
 - 80 other researchers



Scientific “Debate”

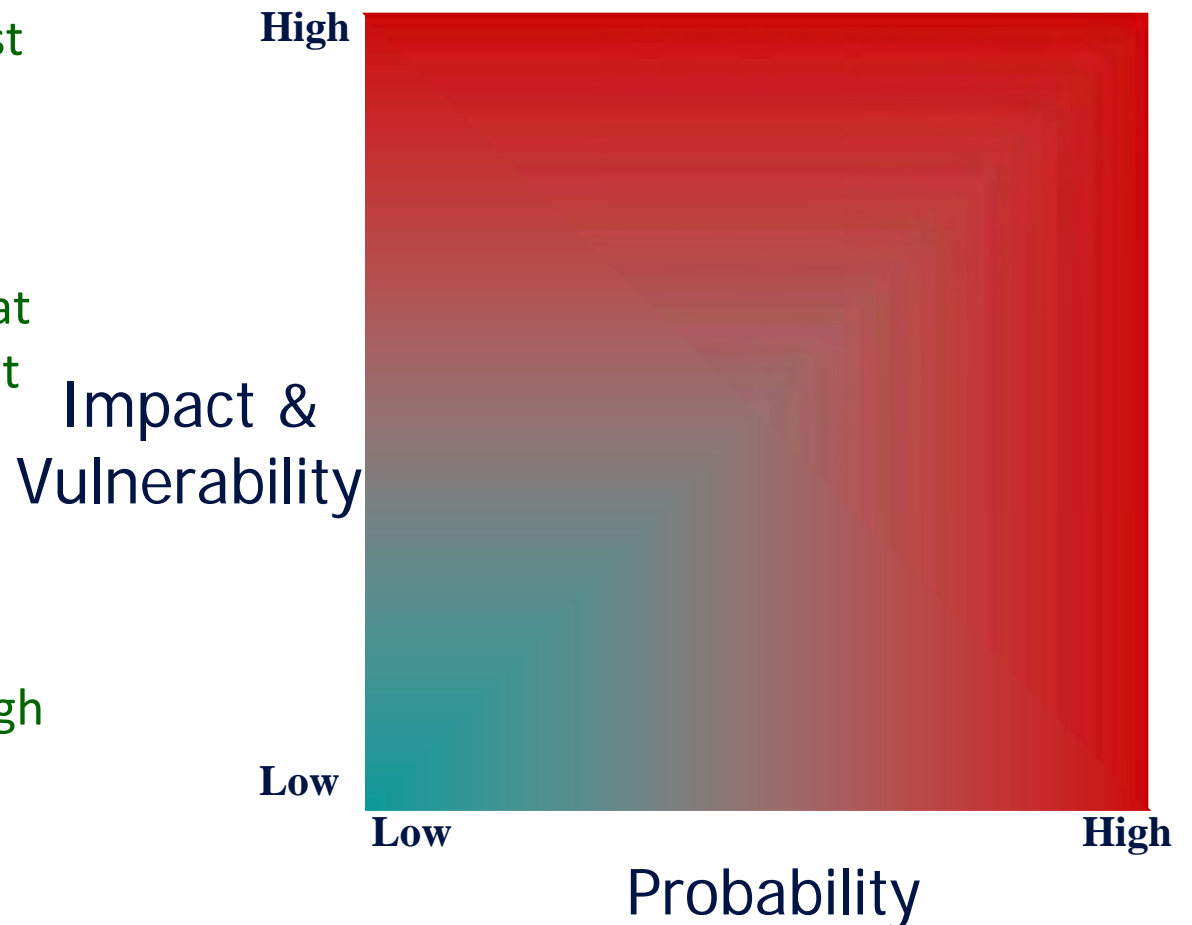
- Science historian Dr. Oreskes (University of California) examined 928 peer-reviewed climate studies published between 1993 and 2003 - **not a single one** argued against the general scientific consensus.
- The National Science Academies of ALL the G8 nations, Brazil, China, India, Mexico and South Africa have signed a statement on climate change.

“Politicians, economists, journalists, and others may have the impression of confusion, disagreement, or discord among climate scientists, but that impression is incorrect.”

Science, Dec. 2004 p.1686

Risk Management

- In everyday business, action is not based on certainty in most cases
- Action is based on the probability of future events happening and the impact that the events will have and what can be done to either
 - Prevent the event from happening or
 - Deal with it if it does
- Will climate change have a high or low impact?
- Is climate change probable?



Example:

Stormwater management in Elkford

- Increase in rain events during winter as temps warm
- No existing policy to encourage reduction of runoff on properties
- Will climate change make it better or worse?
- Can we easily accommodate actions?



Examples of Adaptation Strategies from Elkford

Flooding

- Identify no-development zones where runoff water may be temporarily stored during a flood event
- Build flood protection infrastructure / dyke systems
- Require developments to use pervious materials in driveways and parking lots, and build roads without curbs and gutters

Wildfire

- Create defensible space adjacent to existing structures – reduce forest
- Require new developments to have defensible space – example: no construction within 300 metres of the dense forest, and the forest adjacent to new development thinned

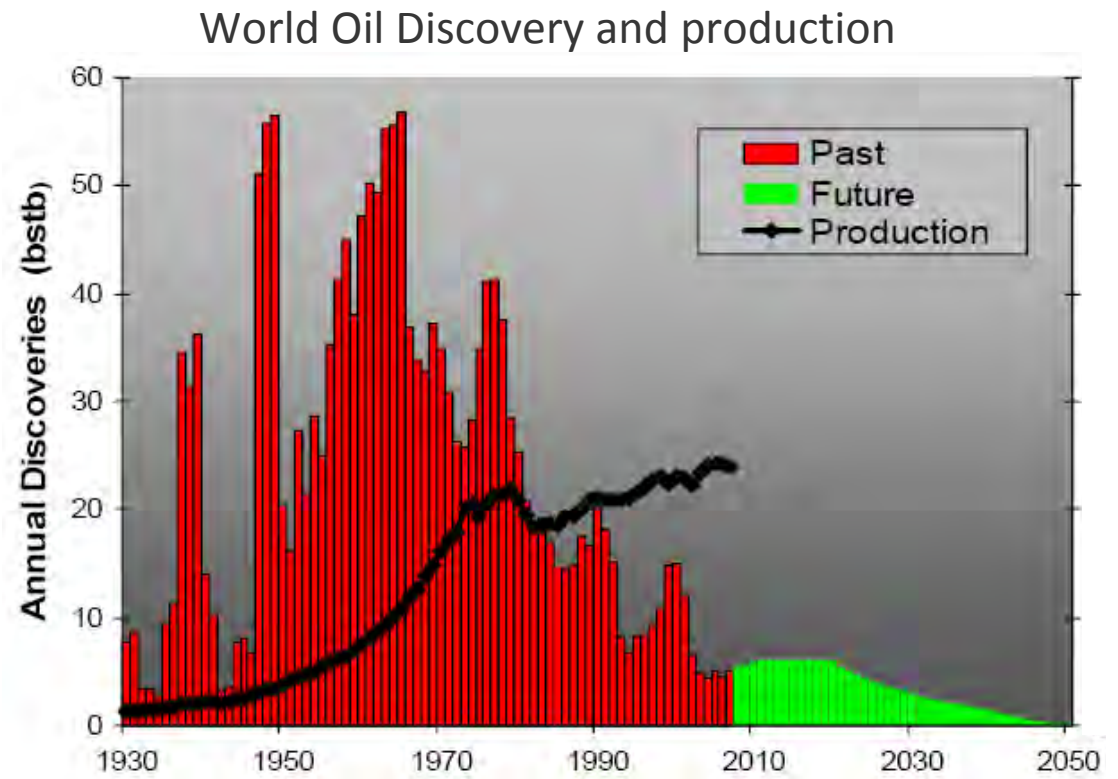


Peak Oil



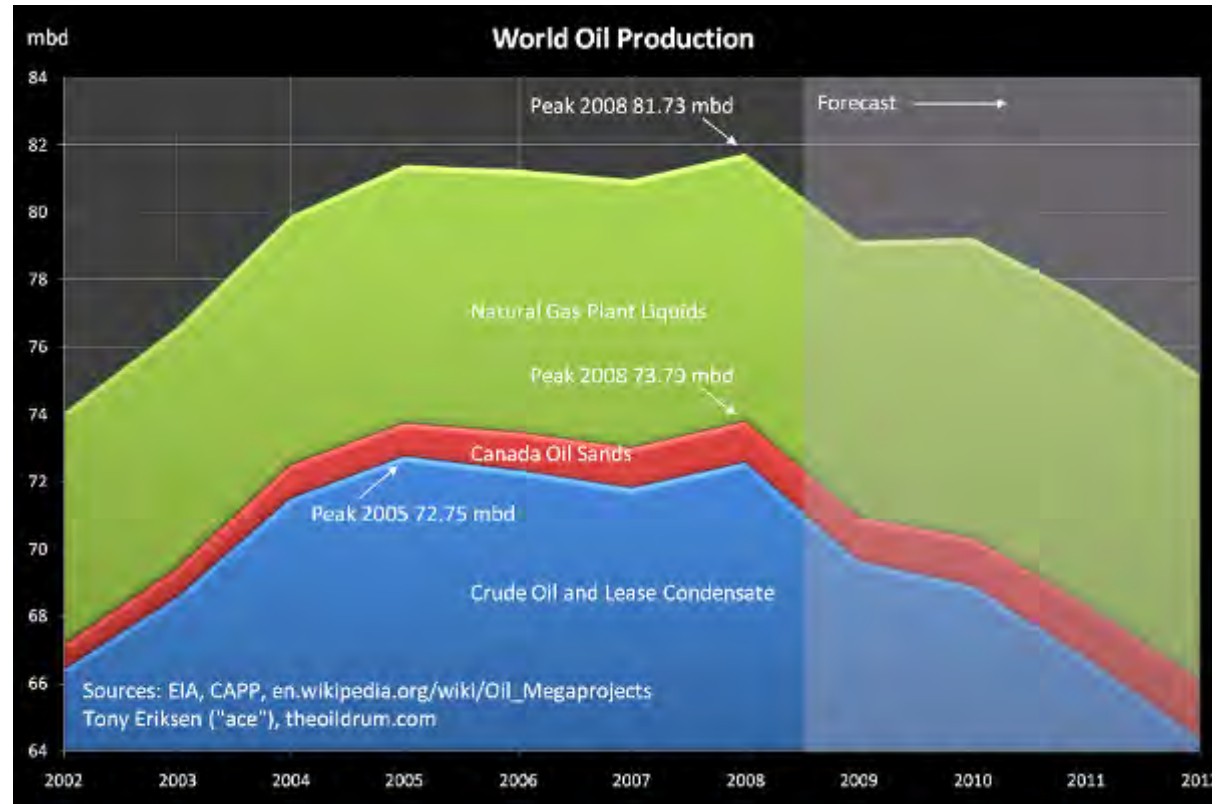
Peak Oil

- Discoveries peaked in 1980's
- Once ½ is extracted from a field / country / region, production starts to decline
- Peak production expected between 2008 and 2030
- Not running out, but production declining while demand projected to grow

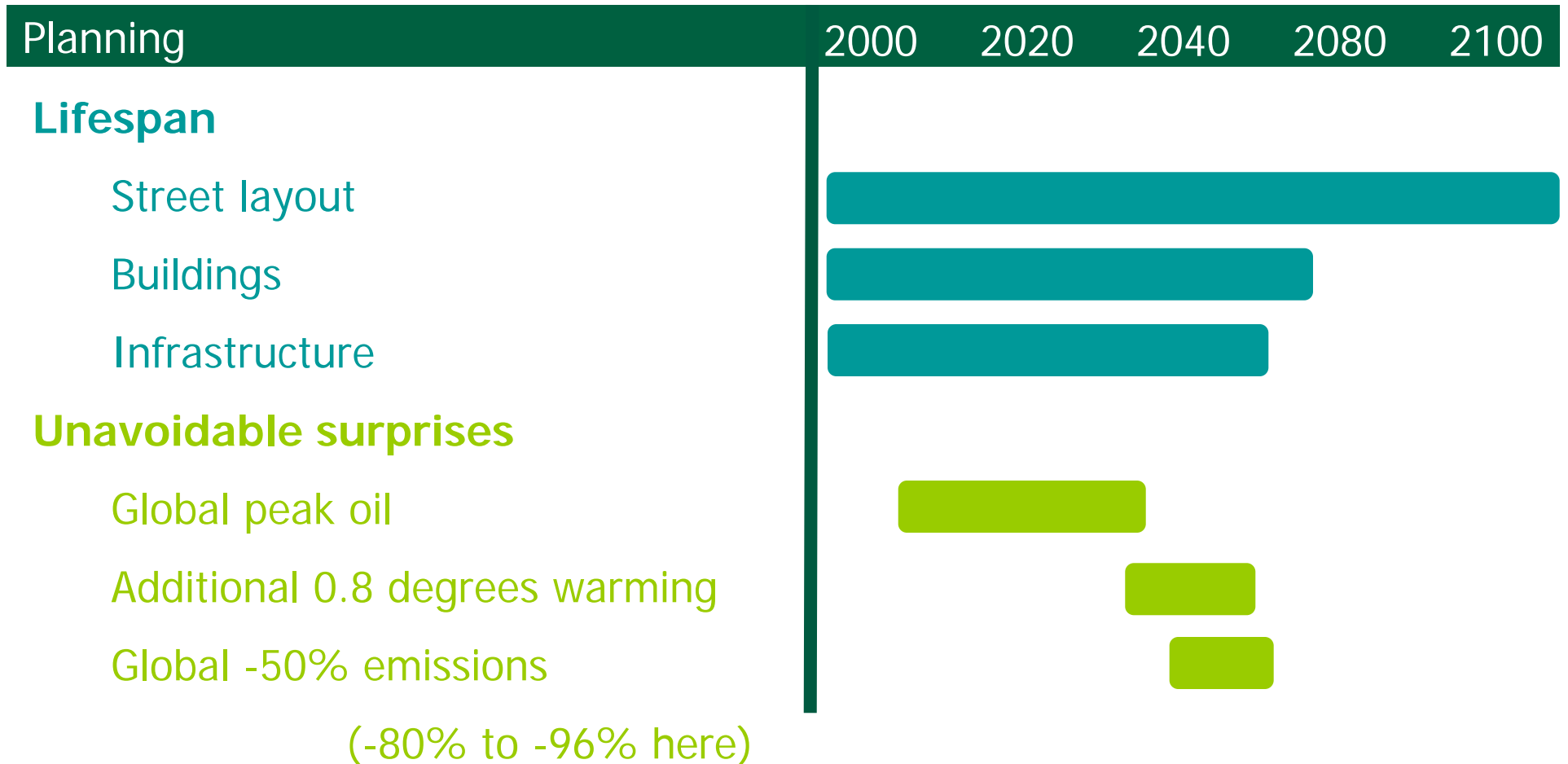


Peak Oil

- 50% of oil consumed by the human race has been used since 1986
- New discoveries harder and more expensive to extract – Lower EROI
- Virtually no increase in production since 2005 despite record high oil prices



Plan for a 'different' future



Economic Development

- Recirculation in local economy
 - Opportunities to use local government purchasing power to build industries
 - Example: BC Biofleet
 - Wealth Management firms such as Dundee Capital recognizing potential of sector (see below June 22 2009 update)
-

Renewable Investments Exceeds Fossil Fuel Investment in 2008

You can't call this "Alternative" Energy anymore

In 2008 the world invested more in new renewable power generation than it did in new fossil fuel generation. Think about it...

According to a report filed by the UN, \$117 billion was invested last year in new energy projects (wind, solar, biofuels, geothermal, etc). If you include big hydro projects, the number jumps to \$140 billion. This compares to the paltry \$110 billion sunk into those belching Coal and Gas plants. Note that Wind still dominates but solar is catching up fast. See the charts below.

This highlights the need for investors watch the cleantech sector

We believe that: 1) significantly reduced valuations, 2) enhanced government stimulus, 3) pending carbon regulations, 4) energy security concerns, and 5) new technology introductions should make this a key area of focus for growth investors. We see select opportunities in differentiated solar, geothermal, smart grid applications, wind enhancement technology, and eventually second generation biofuels. Call us for details if interested.

Another Example: UK Municipal Rules Creating 1.75 Billion pound industry

Every borough must have a
MertonRule x 425



Merton Rule: all new developments
must meet 10% of energy needs
with onsite renewable energy

8kW-15kW Turbines	25	x 425	10,000	£30,000	£300,000,000
kWp PhotoVoliac	200	x 425	85,000	£5,000	£425,000,000
CHP/Bio/GSH/Solar = m2 Solar thermal	5,750	x 425	2,500,000	£400	£1,000,000,000

£1,725,000,000

And jobs in –

Planning, Architecture, Marketing, R&D, Legal, etc

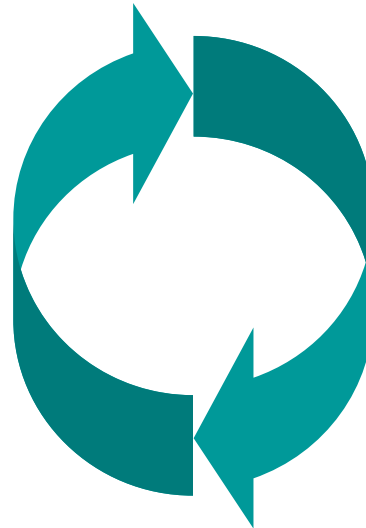
Climate change mitigation & adaptation

- **Climate Change Mitigation**

- Reduce the contribution of greenhouse gases to the atmosphere
- The globally responsible thing to do

- **Climate Change Adaptation**

- Prepare for and respond to the potential impacts of climate change
- The locally responsible thing to do



Communicating for Climate Action

WE CAN'T

- Climate change is not real
- Climate change is not caused by humans / CO2

- Action costs too much
- Action will cost us jobs

YES WE CAN

- Strong scientific consensus
- Prudent risk management
- Debate on what to do, not the cause
- Planning for a changing future, resilient community

- Action less expensive than inaction
- Save money - invest in high priority risks rather than low priority risks from CC
- New investment = economic opportunity
- Insulate against energy \$ escalation



Communicating for Climate Action

WE CAN'T

- What we do doesn't matter
- Why should we act if China doesn't
- This isn't our responsibility – its downloading
- We should wait to act and hope to get more recognition and support

YES WE CAN

- Why should China act if we don't?
- Our past & per capita GHGs much higher
- We have the wealth and resources to lead
- New responsibility for everyone
- Ensuring resilient community and hazard mitigation is job of local government
- Impacts are felt most at the local level
- ≈ 50% of all GHGs from areas of local government influence
- 100% reduction so may as well start now



DISCUSSION

- Role – Playing
 - Choose a reason “why we can’t” and debate “Yes we can” at your table.
 - What works
 - What doesn’t



Thank-you

- Thank-you from the Carbon Neutral Kootenays year-1 implementing agents

Project delivered by:



- Contact us at any time with questions or concerns.

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Connecting communities, energy and sustainability