Paying the price for carbon

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- Five market approaches to reduce emmissions
- Positions of five federal parties

Five market-based approaches

- Cap-and-trade
- Cap-and-auction
- Personal quotas
- Economy-wide quotas
- Carbon tax

Five approaches: **Cap-and-trade**

- In place in Europe since 2005
- Affect only large industrial emitters
  - 12,000 European installations, 40% of EU emissions
  - In Canada, about 800 companies, ½ Canada's emissions

Five approaches: **Cap-and-trade**

- "Cap" refers to the fact that emissions are "capped" or held below a certain level
  - This level should be increasingly reduced
  - Individual companies get emissions permits for the amount they are allowed to emit

Five approaches: **Cap-and-trade**

- "Trade" refers to the fact that companies can trade emissions permits with each other
  - Companies that reduce their emissions more than required can sell their excess permits to companies which fail to meet their emissions reductions targets
  - Emissions overall from the group of large industrial emitters is guaranteed to fall to the permitted level

Five approaches: **Cap-and-trade**

- Of the mechanisms covered here, this is the only one which does not offer a way for individuals to participate in the market
  - Increased costs to industry passed to consumers
  - Companies that invest in efficiencies can benefit from selling off their excess permits, or at least offset the costs of their investment
  - Companies that fail to achieve efficiency levels will lose even more
  - Individuals absorb costs but cannot benefit

Five approaches: **Cap-and-trade**

- European experience has identified some challenges to cap-and-trade
  - Complicated to implement
  - Targets less than half the economy
  - Creates challenges in treatment of new and emerging companies
  - Creates **grandfathering** issue
  - Creates **distortion** at set-up

Five approaches: **Cap-and-trade**

- **Grandfathering** issue
  - Emissions permits given to a company based on emissions that company had before the implementation of cap-and-trade
  - Effectively rewards companies that failed to invest in efficiencies by increasing their emissions permits
  - Punishes those companies that invested in efficiency by lowering their permits even more

Five approaches: **Cap-and-trade**

- **Distortion** at set-up issue
  - Because emissions permits are based on past patterns of emissions, companies increased their emissions in anticipation of cap-and-trade
  - As a result, emissions increased initially

Five approaches: **Cap-and-auction**

- Replaces cap-and-trade to solve grandfathering issues
- Also solves issues of distortion at set-up and what to do with new industries
- Like cap-and-trade,
  attacks only industrial emissions
- Seems to be something the NDP are hinting at; endorsed by George Monbiot as a replacement of cap-and-trade

Five approaches: **Cap-and-auction**

- How it works
  - “Cap” refers to the same cap as in cap-and-trade, but is imposed only on the group of large industrial emitters as a whole, companies are not allocated permits individually
  - “Auction” refers to the fact that the permits are auctioned to the highest bidder
  - Funds from the auction are collected by a government agency

Five approaches: **Cap-and-auction**

- Cap-and-auction creates a new revenue stream to government
  - This is a similarity between cap-and-auction and the carbon tax. None of the other mechanisms discussed gives money to the government.
  - This satisfies the “polluter pay” principle, the idea that pollution is allowed but the polluter must compensate the rest of society for the pollution
  - This is the only way that individuals are affected by the market created – the government can pass on the revenues, invest in efficiency programmes, etc

Five approaches: **Personal quotas**

- Complements cap-and-trade
  - Affects only individuals
  - Targets another sector of the economy that cap-and-trade doesn’t affect directly
  - Britain's Department of the Environment is recommending personal quotas

Five approaches: **Personal quotas**

- How they work
  - Begins with a firm cap like the previous 2 methods, emissions are forced steadily downward
  - Like war-time rationing, each person gets an equal amount of emissions permits
  - Usually allowed to legally trade
  - If not legal to trade, will have black market
  - People who drive a lot, have large houses or take flights would need to buy permits from people who live in small efficient homes and walk to work

Five approaches: **Personal quotas**

- The proposed British program would be traded on plastic cards
  - Each individual would get an equivalent allocation of emission permits monthly on their card
  - The card would have to be used every time they purchased gasoline, paid their home heating fuel bill, bought airline or train tickets or electricity
  - Cards swiped through a reader at purchase points

Five approaches: **Personal quotas**

- The proposed British program would be traded on plastic cards
  - If they did not have enough emissions permits remaining on their card for the purchase, they could automatically purchase more
  - Emissions permits available for sale would be limited to those that people with unneeded permits sold into the market
  - Overall emissions would be controlled, though wealthy individuals could theoretically see their personal emissions rise

Five approaches: **Personal quotas**

- Personal quotas satisfy another theoretical ideal, that of “equal ownership of the commons”
  - If pollution of our common air, water, climate, etc is to be permitted at all, then every person should be entitled to pollute an equal amount
  - Those that pollute more should have to buy the right to pollute from those that pollute less
  - If people who pollute less don't want to sell their excess rights, they can effectively force bigger polluters to bring down their emissions

Five approaches: **Economy-wide quotas**

- This is the first economy-wide mechanism covered
  - Developed by theorists who wanted a mechanism to target the whole economy like the carbon tax, but have the fair distribution of a quota system
  - Meant to replace the cap-and-trade system entirely
  - It is presented as an alternative to the carbon tax
  - Still fairly obscure, but exciting
  - Like personal quotas, satisfies ideal of “shared ownership of the commons” – nobody gets any more right to pollute than anyone else

Five approaches: **Economy-wide quotas**

- Like carbon tax in reverse, attacks the problem through a cap instead of price
  - Like all previous mechanisms covered, begins with a hard cap on emissions which forces emissions steadily down
  - Cap is economy-wide, not limited to industry or individuals

Five approaches: **Economy-wide quotas**

- How it works – similar to personal quotas
  - Every person gets an equal share of the carbon market
  - Industries must purchase emissions permits from people through brokers
  - Individuals who want to further decrease emissions can tear up their shares

Five approaches:
Economy-wide quotas

- How it works – alternate method
  - Alternately, the government effectively auctions off emissions permits to industries and fuel companies
  - Money gained is distributed evenly to people

Five approaches: **Economy-wide quotas**

- Most developed and accessible plan proposed by FEASTA
  - The Foundation for the Economics of Sustainability in Ireland
  - FEASTA's plan called "cap and share"
  - Find out more at www.capandshare.org

Five approaches: **Economy-wide quotas**

- Advantages: firm cap, very fair distribution, economy-wide mechanism
- Disadvantages: complex implementation, still fairly obscure, perceived opposition to “quota” or “rationing” – implies crisis
- It is possible to make the carbon tax equally fair by distributing revenues evenly across the whole population, but you still can't guarantee that emissions reduction targets will be reached

Five approaches: **Carbon tax**

- Peter has covered the basics
- Carbon tax is the only mechanism that attacks the problem through price rather than firm emissions controls
  - From an economic standpoint, the effect should be the same
    - When prices go up, people use less
    - When less is available to use, prices go up
  - There is such wide variation in the way a carbon tax can be implemented that it can't really be said to be a single method

Five approaches: **Carbon tax**

- Carbon tax variations to consider
  - Scope?
  - Collection point?
  - Revenue neutral?
  - How money returned?

Five approaches:
Carbon tax: Scope?

- Carbon taxes can be sector specific, or even more specific
  - They can apply to large final emitters, similar to what NDP seems to be proposing
  - Where cap-and-trade is in place, carbon taxes are considered to deal with the rest of the economy
  - Our existing excise tax on gasoline is effectively a very specific carbon tax
  - Usually, these days, advocates of carbon tax are calling for an economy-wide approach

Five approaches:
Carbon tax: Collection point?

- Reasons to collect at source
  - Fewer choke points, less slippage
  - Can help prevent fossil fuel industries from using energy before it enters the economy, avoiding taxes
  - This is a serious concern for newer sources – for example tar sands uses energy equivalent of 2 barrels of oil for every 5 barrels produced
  - Fossil fuel extraction is increasingly energy intensive, so it's a growing concern
  - Efficiencies encouraged throughout the economy

Five approaches:
Carbon tax: Collection point?

- Reasons to collect at consumer end
  - Traditionally where taxes are collected
  - Easier to know effect on consumer's pocketbook
  - Can distinguish between uses,
    so smokestacks can be taxed higher than plastics

Five approaches:
Carbon tax: Revenue neutral?

- Reasons to use revenue
  - New revenue stream for government
  - Fund green economy
  - Direct programs towards affected poor people, for example insulating rental housing

Five approaches:
Carbon tax: Revenue neutral?

- Reasons to keep it revenue neutral
  - It proves to the public that it isn't a government cash grab. It's a good idea even if the government gets no money, because it influences choices towards efficiency. People see it as a rebate as much as a tax.
  - It's a sin tax. You want the revenues to go down, so it's a bad idea to depend on it for government services. Creates a conflict of interest for government policy.

Five approaches:
Carbon tax: Revenue neutral?

- Reasons to keep it revenue neutral
  - When you put government in position of picking market winners, they have a history of picking losers with powerful lobbies:
    - ethanol, hydrogen, fission, fusion, sequestration
    - Even government support for efficiencies tends to encourage industry to make more efficient leaf-blowers rather than discouraging leaf-blowers altogether

Five approaches:
Carbon tax: Revenue neutral?

- Reasons to keep it revenue neutral
  - *"Washington likes to spend our tax money line-by-line. Swarms of high-priced lobbyists in alligator shoes help Congress decide where to spend, and in turn the lobbyists' clients provide 'campaign' money.*

    The public must send a message to Washington. Preserve our planet, creation, for our children and grandchildren, but do not use that as an excuse for more tax-and-spend. Let this be our motto: 'One hundred percent dividend or fight!'"
    - *James Hansen, NASA's chief climatologist, June 2008*

Five approaches:
Carbon tax: Revenue neutral?

- Reasons to keep it revenue neutral
  - Offsets financial burden with a direct rebate
    - Rebate enables investment in emission reductions
    - Gives the poorest citizens the means to invest in emissions reductions
    - Allows most vulnerable to choose options the government hasn’t, or that aren't covered by government programmes – for example, the single unemployed mom in rental housing may not be able to take advantage of rebates on efficient cars and appliances of energy retrofits, but a cash influx may allow her to move

Five approaches:
Carbon tax: How money returned?

- If carbon tax is returned to the public, how is it returned?
  - Tax reductions
    - Income, payroll taxes, etc
  - Supplements
    - For poor, renters, elderly, etc
  - Equal distribution
    - Each person gets an equal share

All market mechanisms: **Import/Export treatment**

- There are potential implications for both imports and exports that may need to be addressed for any market mechanism
  - Imports
    - Imported goods may have high emissions profile and compete with Canadian goods made in an environment where pricing encourages efficiency investments, not fair to Canadian industry
  - Exports
    - Canadian manufacturing for export may be hurt

All market mechanisms: **What gets affected most**

- Keep in mind that the effect of raising the price is economically equivalent to imposing a cap and allowing the price to rise
  - A $10/tonne CO2 carbon tax or a related cap gives
    - Gasoline – goes up 2.4 cents/litre
    - Natural gas – goes up 2 cents/cubic metre
    - Electricity from coal – goes up 1 cent/kwh
  - Compare to market variations in the last year
    - Gasoline prices ranged from $0.91 – $1.37/litre
    - Natural gas ranged from 25-48 cents/cubic metre
    - Electricity from coal – pretty stable at about 7 cents/kwh

All market mechanisms: **What gets affected most**

- Note the percentage change
  - Natural gas goes up 4% of high price
    - 8% of variation in the last year
  - Gasoline goes up 2% of high price
    - 5% of the variation in the last year
  - Electricity from coal goes up 15% of the price
- Electricity from coal is by far the most affected
  - A carbon tax of $70/tonne
    would double the price of coal fired generation

All market mechanisms: **What gets affected most**

- Why does coal get affected most?
  - Partly because fuels get differentially targeted according to how much carbon they release when burned – natural gas releases the least CO_2,

    oil is intermediate, coal is the worst
  - Partly because most energy released in electrical generation is lost as waste heat, some more is lost in transmission, so a lot of coal has to be burned

All market mechanisms: **What gets affected most**

- Why would we want to target coal?
  - Partly because natural gas and oil are cleaner fuels
  - Partly because we are running out of natural gas and oil anyway
  - The existing deposits of the dirtiest fossil fuel are the biggest climate threat

Party positions

- Conservatives
- Liberals
- Bloc
- NDP
- Greens

Party position: **Conservatives**

- PM Harper campaigned against any sort of emissions controls prior to his election.
- *"Kyoto is essentially a socialist scheme to suck money out of wealth-producing nations."*
- In Nairobi in 2006, Canada was negatively portrayed in media as hampering climate progress
- PM Harper changed Environment Minister from Rona Ambrose to John Baird.

Party position:
Conservatives

- Baird then adopted **aspirational intensity targets**
- Aspirational targets are not enforced nor encouraged with consequences in any way
- Intensity-based targets are based on unit of production – emissions can increase as long as more is produced for the same level of emissions.

Party position:
Conservatives

- After a greater spotlight on the issue at Bali conference in December 2007, made **intensity-based targets** mandatory for industry
- Alternative methods for industry compliance are offered – including domestic and foreign trading
- Again, no guarantee that emissions will decrease, willingness to see them rise
- Overall target: 20% below 2006 levels by 2020 (equivalent to slight increase over 1990 levels)

Party position:
Liberals

- Long history of recognizing climate change as a threat
- History of ineffectiveness at tackling it almost as long – under their leadership, emissions rose 27% above 1990 levels
- Signed onto Kyoto, honour Canada's commitments
- Have supported cap-and-trade along with regulatory changes and incentives

Party position:
Liberals

- Brand-new plan in 2008 supports **carbon tax**
- **Economy-wide**, **consumer end**
  - $10 per tonne of CO_2
  - rising to $40 per tonne over 4 years
- Will not affect gas at the pump
  - As they introduce it, will be phasing out the current excise tax on gas, which is about $42 per tonne
- **Tariff** on imports to protect Canadian industry

Party position:
Liberals

- **Revenue neutral**, part of comprehensive tax restructuring
  - Money returned through income tax reductions
  - Greatest reductions in lowest tax brackets, smaller reductions for middle tax brackets, no reductions for highest tax brackets
  - Additional employment credits, income tax benefit, support for rural, northern and Canadians with disabilities, boost to Guaranteed Income Supplement, new Guaranteed Family Supplement, raising income limit for child tax benefit, etc

Party position:
Liberals

- **Cap-and-trade** for large final emitters, as well
- Overall target:
  80% reduction by 2050 below 1990 levels

Party position:
Bloc

- **Cap-and-trade** for large final emitters
- Overall target:
  80% reduction by 2050 below 1990 levels

Party position:
NDP

- *"Layton had said a carbon tax would punish consumers, particularly seniors and the poor, for buying essentials such as gas, home heating fuel and electricity."*
  - CTV, May 2008
- NDP has consistently attacked the carbon tax because it would hurt the poor

Party position:
NDP

- *"NDP Leader Jack Layton was joined by a number of NDP candidates from across Canada with environmental backgrounds today to outline why a cap-and-trade system is the best option for fighting climate change in Canada."*
  - NDP statement "Pricing Carbon Reducing Pollution", May 2008
- NDP has repeatedly promoted "**cap-and-trade**"
- Unclear that what they mean is what we've defined here

Party position:
NDP

- *"All of these funds would be invested in developing green technologies and making them affordable for the average consumer."*
  - NDP statement "Pricing Carbon Reducing Pollution", May 2008
- Problem with that statement is that in a cap-and-trade system, there are no revenues for government to invest

Party position:
NDP

- *“auctioning credits would generate at least $2.5-billion”*
  - NDP statement “Pricing Carbon Reducing Pollution”, May 2008
- NDP statements have repeatedly used the term “auction”
- So perhaps they mean **cap-and-auction**?

Party position:
NDP

- *"Under the NDP's plan, the initial sale of carbon credits to industry would be set at approximately $35 per tonne."*
  - Jack Layton, National Post, June 2008
- *"Layton's alternative 'cap-and-trade' plan would force big polluters – which account for half of Canada's greenhouse gas emissions – to pay $35 per ton of carbon emitted."*
  - CTV, May 2008
- A set price is a **carbon tax**, not cap-and-trade or cap-and-auction

Party position:
NDP

- What has been clear in all of NDP releases is that their programme is **not revenue neutral**
  - "*To help workers adapt to the shifting employment sectors in the new energy economy, one billion dollars of the fund would be dedicated to training. The rest of the fund would be dedicated to making it more affordable for middle and lower income families to make sustainable purchases, such as fuel-efficient vehicles and low-consumption home appliances, and to retrofit their homes to reduce heating costs.*"
    - NDP statement "Pricing Carbon Reducing Pollution", May 2008
  - Unclear how this programme would benefit poorest citizens more than giving them a direct rebate.
- Overall target:
  80% reduction by 2050 below 1990 levels

Party position:
Greens

- Long-time plan, refined over last few years
- **Economy-wide carbon tax**, **at source**, where carbon enters the economy (not consumer end)
  - Starting at $50 per tonne of CO_2
  - Rising to $100 by 2020 if necessary
- **Revenue neutral**
  - Money returned through income and payroll taxes
  - Income tax restructuring to allow income splitting
  - Rebate for rural and seniors

Party position:
Greens

- Policy convention coming up ... I've put in a policy proposal to distribute the funds equally to each person instead of current plan
- Will fund transition to green economy with money gained from removing perverse subsidies to automobile and oil industries, etc.
- **Cap-and-trade** for large final emitters, as well
- Overall target:
  80% reduction by 2050 below 1990 levels

We need to work together

- All pricing mechanisms should have a beneficial effect on reducing emissions
- We can promote our own ideas,
  but recognize the value of other ideas as well
- We should not stand in the way of any pricing mechanism, the planet doesn't have time to wait while we sort through our differences

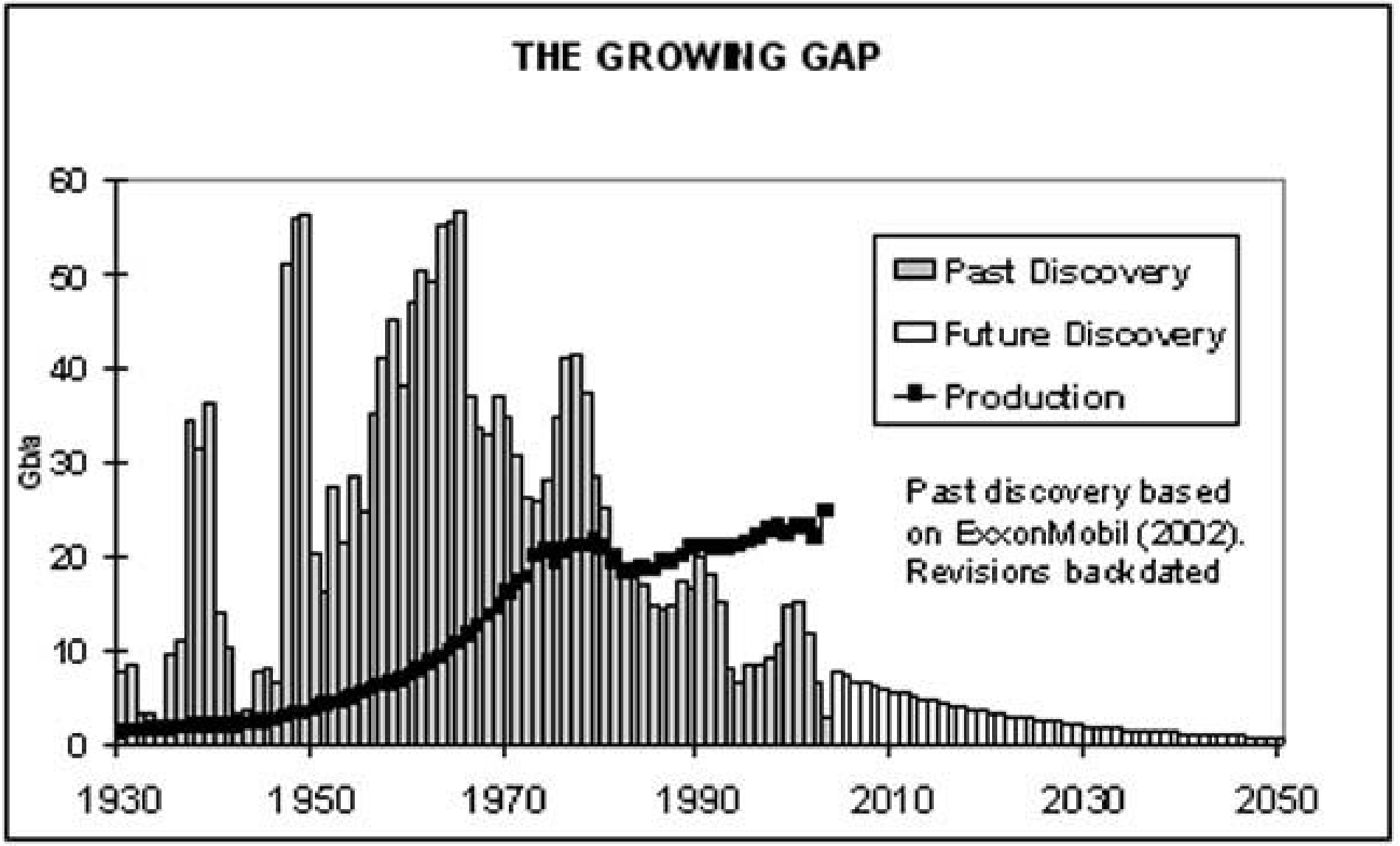
Extras

- Extra stuff below

Green Party tax shift summary

Household Income	Tax Benefit	Carbon tax impact
$10,000.00	$515.00	$260.00
$15,000.00	$1,829.00	$442.00
$50,000.00	$1,327.00	$1,421.00
$55,000.00	$807.00	$1,166.00
$65,000.00	$1,101.00	$1,274.00
$115,000.00	$2,113.00	$1,277.00
$140,000.00	$1,367.00	$1,590.00
$140,000.00	$3,352.00	$1,645.00
$140,000.00	$3,352.00	$2,273.00

Oil discoveries vs production



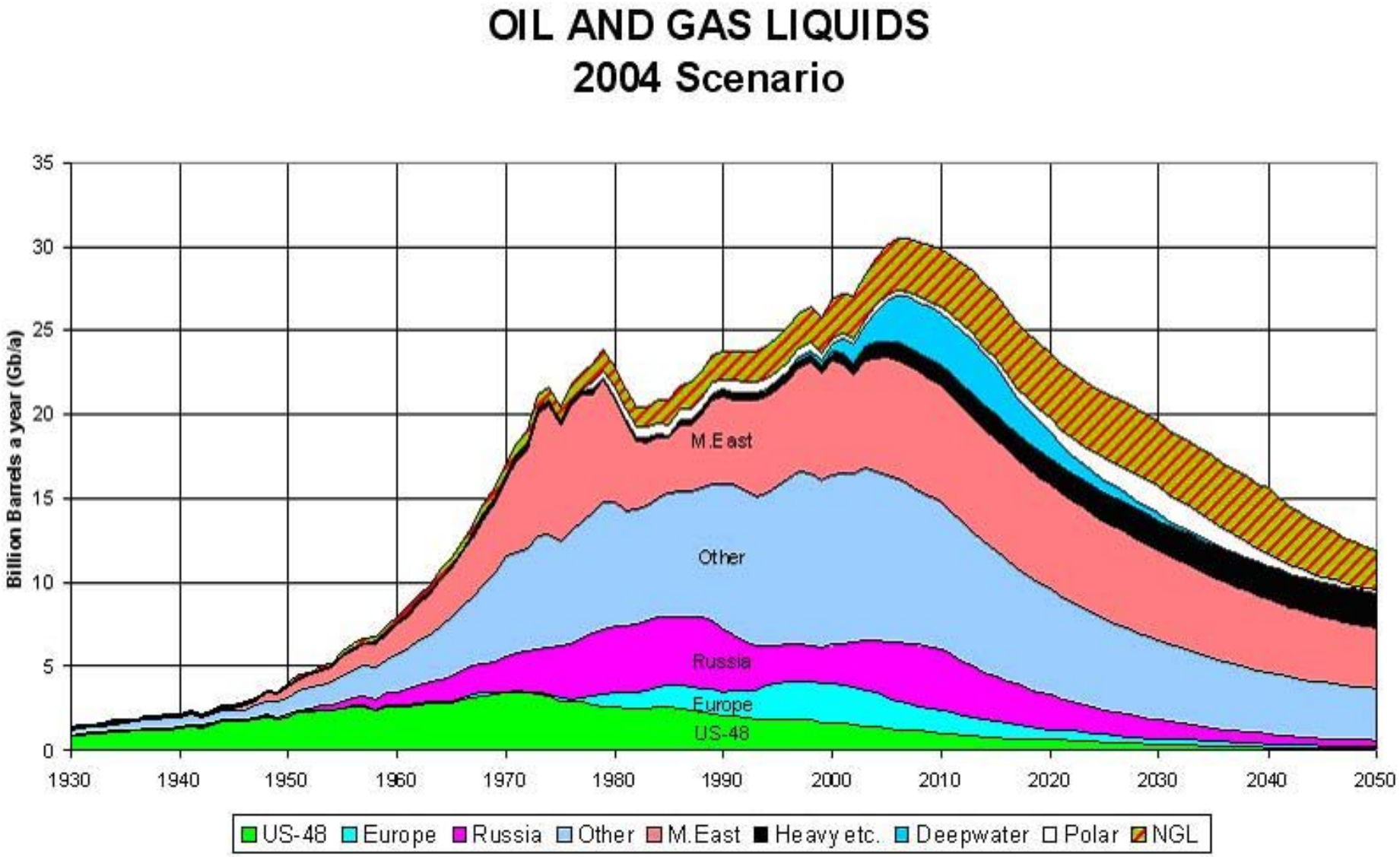
Is there even that much oil?

SPURIOUS RESERVE REVISIONS

	Abu Dhabi	Dubai	Iran	Iraq	Kuwait	Neutral Zone	Saudi Arabia	Venezuela
1980	28.0	1.4	58.0	31.0	65.4	6.1	163.4	17.9
1981	29.0	1.4	57.5	30.0	65.9	6.0	165.0	18.0
1982	30.6	1.3	57.0	29.7	64.5	5.9	164.6	20.3
1983	30.5	1.4	55.3	41.0	64.2	5.7	162.4	21.5
1984	30.4	1.4	51.0	43.0	63.9	5.6	166.0	24.9
1985	30.5	1.4	48.5	44.5	90.0	5.4	169.0	25.9
1986	30.0	1.4	47.9	44.1	89.8	5.4	168.8	25.6
1987	31.0	1.4	48.8	47.1	91.9	5.3	166.6	25.0
1988	92.2	4.0	92.9	100.0	91.9	5.2	167.0	56.3
1989	92.2	4.0	92.9	100.0	91.9	5.2	170.0	58.1
1990	92.2	4.0	92.9	100.0	91.9	5.0	257.5	59.1
1991	92.2	4.0	92.9	100.0	94.5	5.0	257.5	59.1
1992	92.2	4.0	92.9	100.0	94.0	5.0	257.9	62.7
1993	92.2	4.0	92.9	100.0	94.0	5.0	258.7	63.3
1994	92.2	4.3	89.3	100.0	94.0	5.0	258.7	64.5
1995	92.2	4.3	88.2	100.0	94.0	5.0	258.7	64.9
1996	92.2	4.0	93.0	112.0	94.0	5.0	259.0	64.9
1997	92.2	4.0	93.0	112.5	94.0	5.0	259.0	71.7
1998	92.2	4.0	89.7	112.5	94.0	5.0	259.0	72.6
1999	92.2	4.0	89.7	112.5	94.0	5.0	261.0	72.6
2000	92.2	4.0	89.7	112.5	94.0	5.0	259.2	76.9
2001	92.2	4.0	89.7	112.5	94.0	5.0	259.3	77.7
2002	92.2	4.0	89.7	112.5	94.0	5.0	259.3	77.8

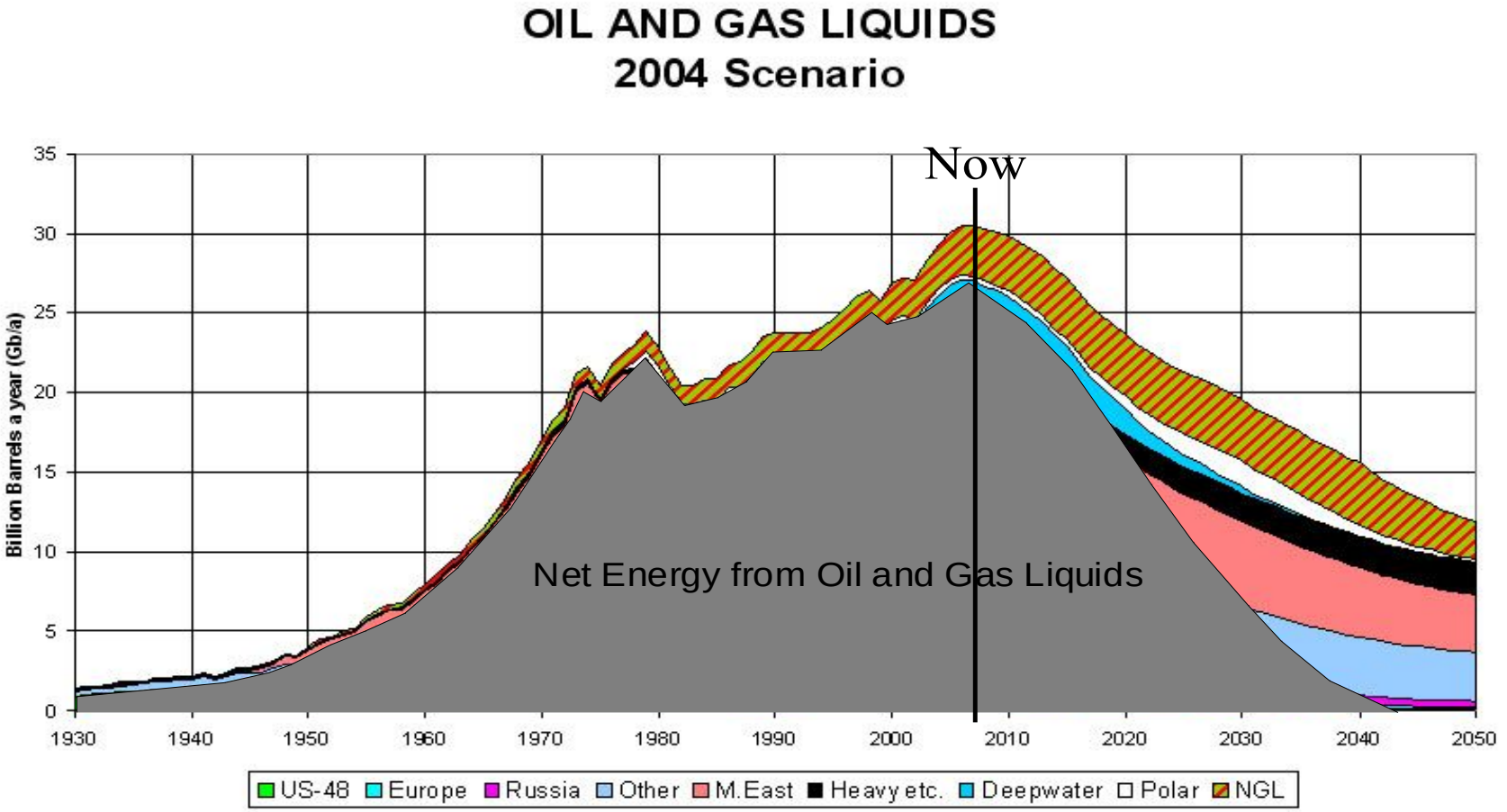
Anomalous increase underlined. Note also implausible unchanged estimates.

Total oil and gas liquids



Net energy remaining

OIL AND GAS LIQUIDS 2004 Scenario
Updated by Colin J. Campbell, 2004-05-15



Canadian Natural Gas projected to decline

CALGARY – Deliverability of Canadian natural gas will decline by seven to 15 per cent during 2007-2009, says a National Energy Board (NEB) report released today.

The report, Short-term Canadian Natural Gas Deliverability 2007-2009, says gas deliverability will decrease from 483 million cubic metres per day (m3/d) or 17.1 billion cubic feet per day (Bcf/d) at the end of 2006, to a lower range between 410 and 449 million m3/d in 2009 (14.5 to 15.8 Bcf/d).

"The drilling pace that sustained Canadian natural gas deliverability is gone, for the moment," said National Energy Board Chair Gaétan Caron.

Canadian natural gas production energy return on investment