

# **The Natural Resource Industries as Engines of Economic Diversification**

## **Summary of the Second Banff Innovation Summit**

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**The Banff Centre**

**Banff, Alberta, Canada**

**Organized by:**

**The Centre for Innovation Studies (THECIS)**

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## **Executive Summary of Main Points**

### ***Advantages and disadvantages stemming from our unique history as natural resource producers.***

#### ***Advantages:***

- Most of the educational, technical and management capabilities to innovate and diversify exist already in the region or can be accessed relatively easily by enterprises that stay in the region.
- The resource industries are linked into an already diverse range of neighboring industries that are rooted in the region, offer wide scope for innovative entrepreneurial activity and have the potential to achieve global reach.
- The region supports a growing pool of experience in creating successful globally-competitive high value-added enterprises.
- Resource enterprises have extensive managerial experience and financial experience related to creating value from entrepreneurial risk.
- The region has a limited, but mostly positive history of Government-industry articulation in structuring the development of large-scale innovation initiatives in the resource and allied industries.

#### ***Disadvantages:***

- With few exceptions, most Canadian resource sectors are no longer global technology leaders. Some have climbed down the value chain leading to questions about their viability.
- Many historically productive linkages between the technology (capital goods), manufacturing and resource components of the Canadian economy have been allowed to disintegrate.
- Since the 1960s, Federal governments and many Provincial governments have prioritized employment stabilization strategies over innovation strategies.
- A 'rip-and-ship' mentality – a rush to take commodity prices at the lowest levels of added value – still dominates the resource industries

### ***What can we not do well today that we must be able to do extremely well in 10 years?***

We must achieve the ability to convert threats to our resource-based wealth into opportunities to innovate and diversify.

We must achieve a high degree of coordination and parallel thinking across the region that encompasses both the entire industrial spectrum and the various administrative jurisdictions.

We must develop a sophisticated futures capability employing foresight and life cycle assessments.

We must be in a position where no resource industry in the region is going backwards in the value chain.

***How can the addition of new value to our natural resources best contribute to achieving the vision?***

Look for the unintended consequences of climbing a value chain, or switching to a nearly adjacent chain – exploit the additional opportunities that emerge whenever enterprises change position in a value chain.

By developing innovative business models, multiply experience with production into the ability to make rather than take prices.

Create opportunities within existing value chains by diverging from global norms.

Promote agility over firm size and economies of scale.

Don't assume that you have to change the product in order to add value to it.

***How can we gear up to do the completely unexpected?***

Ground the institutional support mechanisms for innovation and diversification in the dominant industrial characteristics of the region's resource industries rather than in the characteristics of industries that are not yet rooted in the region.

Do not expect high-risk entrepreneurial enterprises to meet the same accountability requirements as established enterprises in mature markets.

Enhance the knowledge transfer environment between companies outside of the R&D and IPR milieu.

Choose a few 'big ideas' that will ensure the future of the resource industries while at the same time delivering high potential to become 'engines of growth' – to encourage innovation in a broad range of complementary industry sectors.

Focus public support more on downstream market-making than on upstream research and invention.

## The Banff Innovation Summits

The Banff Innovation Summits were inaugurated in 2006. The aim was to establish a periodic forum for high-level exchanges of knowledge and experience between senior individuals in industry, government, academia and the community regarding critical issues in innovation policy and strategy that will affect the future prosperity of western Canada.

The Banff Summit format was designed to stimulate free and frank exchange of knowledge within carefully selected groups that would incorporate as broad a range of experience and expertise about particular issues as practically could be assembled in one room at one time. All discussions occurred on a peer-to-peer basis and participants played a direct role in shaping the final outputs, which represent their *consensus view*.

In order to enable Summiteers to disassociate their individual observations and perceptions from the official positions of institutions to which they were affiliated, the Banff Summits adhere strictly to the Chatham House Rule.\*

The First Banff Summit – *Integrating the Creative Capabilities of Western Canada into the Global Innovation System* – was held in September 2006. This inaugural Summit examined regional innovation challenges and opportunities from a broad perspective. The Second Banff Summit focussed specifically upon the natural resource industries – certainly the single most important economic driver in the region.

## Preamble

Western Canada has some of the richest natural resource endowments to be found anywhere in the world. Currently the region is experiencing extraordinary and unprecedented levels of growth and prosperity, which in turn have become a major factor in investment and job creation in Canada as a whole.

But is the extraction and export of resource commodities enough to sustain growth and prosperity? This question largely defines the history of this region, which has been characterized by frequent dramatic shifts between boom and bust, driven typically by external factors. The question is especially pertinent during the current economic downturn and the extreme volatility in global commodity and financial markets. Completely aside from any economic spin-offs and multipliers, it is now much less certain that commodity prices will stay at levels sufficient to sustain the resource industries themselves. Already these industries are experiencing significant declines in investment.

***...sustaining  
resource-based  
prosperity in an  
uncertain world***

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\* Chatham House is home to the Royal Institute of International Affairs. The Chatham House Rule is that "... participants are free to use the information received, but neither the identity nor the affiliation of the speaker(s), nor that of any other participant, may be revealed." (Royal Institute of International Affairs 2002).

It is widely accepted that innovation-driven industrial diversification plays a major role in mitigating the effects of turbulent economic cycles. But there is much debate about the role and influence of the resource industries – for good or ill – in achieving this goal. Some claim that resource endowments fundamentally inhibit the creation of new high value-added enterprises. Others claim exactly the opposite – that the intelligent exploitation of natural resources stimulates innovation and diversification throughout the broad industrial fabric.

***...resource industries as enablers or inhibitors***

What is known for certain is that the resource endowment will not cease to be a major factor in the western Provincial economies anytime soon – regardless of whether commodity markets go up or down. What is understood far less well is how the resource extraction industries are or could be integrated into regional capabilities to innovate and diversify.

***...the importance of resource industries will not diminish***

Uniquely among Canada's major industries, the nature and extent of innovation in the resource sectors is mostly invisible to the standard economic indicators. In large measure this is because the indicator regime defines innovation narrowly in terms of R&D-intensive companies in manufacturing industries. In Canada, innovation is measured largely according to the take up of Scientific Research & Experimental Development tax credits (SR&ED). This is a major problem given that the resource industries are predominantly *capital* intensive. Clearly they also innovate, but in different ways and perhaps for different reasons. Much of their innovative activity is known to occur 'on-site' rather than in the laboratory, thus typically it is not even eligible for SR&ED credits, much less captured by these metrics.

***...the innovation characteristics of the resource industries are invisible to most indicators***

Lack of knowledge about how and why these industries innovate presents many challenges for diversification strategies and policies in the region. Is it enough simply to divert some of the public and private revenues from resource extraction into high technology industries? Should we focus instead on exploiting more of the value-added potential within the resource supply chain itself? Or are there more integrated solutions and strategies?

***...understanding these dynamics is essential to understanding the overall innovation dynamics of the region***

Finding answers to questions like these requires that we greatly improve our understanding of the roles of the resource industries in our overall industrial structure. As a first step, we need to tap into the existing pool of experience

with this problem which exists at many levels of industry and government.

### ***The Goals of the Second Banff Innovation Summit:***

Our **first goal** was to capture, combine and assimilate as much expert knowledge as possible about the innovation characteristics and dynamics of the natural resource industries, especially as concerns their current and potential roles in western economic diversification.

Our **second goal** was to achieve a reasonable consensus about the best options for leveraging the dynamics of innovation in the natural resource sectors in order to motivate and support generally effective diversification policies and strategies in the region.

### ***The participants:***

The Summit brought together a hand-picked group of executives from key resource industry companies, entrepreneurs, senior officials from industry associations and from major National and Provincial research agencies, leading scholars and senior civil servants from Provincial and Federal government departments and agencies.

### ***The structure:***

The Summit was structured around four '**conversations**', each of which explored a different dimension of the innovation and diversification issue.

These were sequenced such that the Summit as a whole would progress from a discussion of where the resource-rich western Provinces stand at present in terms of innovation and diversification, and where they would like to be - or where it may be necessary for them to go – in the next 10-20 years.

The **FIRST CONVERSATION** re-examined critically some of the dynamics that usually are considered to reflect the **status quo** in the resource-producing Provinces.

The **SECOND CONVERSATION** set out a **vision of 'sustainable diversified prosperity'** in the region over a ten to twenty year timeframe and explored the internal and external factors that might shape these outcomes.

The **THIRD CONVERSATION** explored various ways of attaining the vision by **adding new value** to resource-based commodities.

The **FOURTH CONVERSATION** explored the possibilities and pitfalls of **striking out in entirely new directions** – getting involved in industries that have no necessary long-term association with resource extraction as such.

Each conversation was motivated by an invited **Challenger** whose task was to question conventional wisdom and encourage Summiteers to think out-of-the-

box. The Challengers were:

*David Layzell PhD*, Director, Institute for Sustainable Energy, Environment & Economy (SEE), University of Calgary.

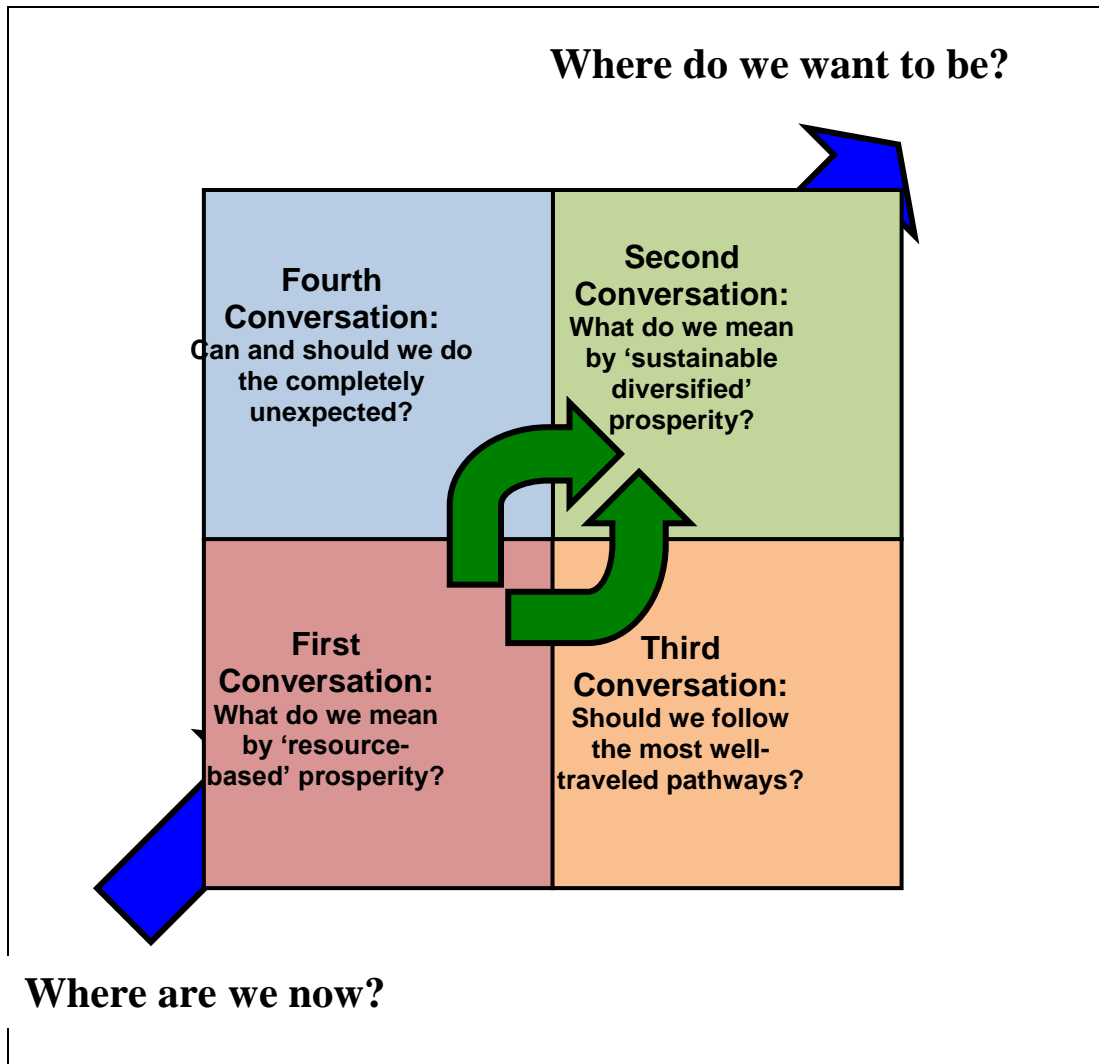
*Peter Phillips PhD*, Professor and Head of the Department of Political Studies, University of Saskatchewan.

*Jeremy Hall PhD*, Associate Professor, Faculty of Business Administration, Simon Fraser University.

*Richard Hawkins PhD*, Professor and Canada Research Chair in Science, Technology and Innovation Policy, University of Calgary.

Each conversation was led by an **Animator**, drawn from among the Summit participants. The Animator's task was to ensure that a balanced range of opinions emerged from all of the stakeholder constituencies

## The Structure of the Second Banff Innovation Summit





## Summary of Proceedings

The following summary outlines the key observations that emerged from each of the four conversations.

The first pair of conversations yielded an expert assessment our present position with respect to innovation and diversification in the region. They also defined a realistic vision of where we need to be in order to sustain and enhance the levels of prosperity to which we have become accustomed.

The second pair of conversations explored various conventional and non-conventional routes to achieving this vision.

For each conversation, we present first a synopsis of the motivating observations made by the Challenger. We then we summarize key observations, issues and ways forward as discussed by the Summiteers.

### I. Defining Our Goals

#### The First Conversation

##### What do we mean by ‘resource-based’ prosperity?

##### ***Challenging the conventional wisdom:***

Richard Hawkins (*Canada Research Chair in Science, Technology & Innovation Policy at the University of Calgary*) challenged Summiteers to re-evaluate how they perceive the relationship with the resource base. He proposed that the economies of the western Provinces are historically intertwined with natural resource extraction, and that this fact inevitably will continue to shape innovation and diversification policies and strategies.

***... need to re-evaluate the relationship with the resource base***

But he stressed that this region is not a ‘resource’ economy as normally understood. Rather, it is highly diversified already and becoming more so. If currently the region exports resource commodities at a too low level of value, it is because this is expedient, if short sighted. It is not as with most other resource-rich parts of the world because the region is incapable of adding value to them or of integrating resource-based wealth with a much broader base of local industries and services.

***...western Canada is not a typical resource-based economy***

Thus, Dr Hawkins proposed that the problem is not really how to overcome the so-called ‘resource curse’. He questioned whether there was really a ‘new’ economic paradigm that would simply replace *natural* resources with *knowledge* resources. Rather, he proposed that the more realistic goal will be to grow and sustain innovation and diversity *alongside* and *within* the resource base, in ways

***...no ‘new economy’ – need to focus within and alongside the resource sectors***

that make *all* economic sectors more resilient in the face of fluctuations in global commodity markets. Only in this way could globally competitive high value-added industries be anchored in resource producing regions.

Dr Hawkins entreated Summiteers not to view resource wealth simply as a pool of cash that eventually must be re-invested in the generation of knowledge-based industries. Rather, he proposed that we need to regard the intelligent exploitation of our resources as being possible only by integrating the resource industries much more fully with an already highly diversified regional and national economy. A diverse range of regional industrial capabilities vastly increases the possibilities for leveraging much more value from our resource endowments, and for making this value stick in the region.

***...building upon existing diversity***

### ***Observations and insights:***

Summiteers concurred that historically there has been an opportunistic relationship between natural resources, innovation and diversification in Canada. The problem has been that until recently most of the significant innovation initiatives have been pursued outside of the resource producing regions; the added value being imported back into these regions.

***...an opportunistic relationship between natural resources and diversification***

In the past, Canada has benefited enormously from this arrangement, at one time being a world leader not only in commodity production but also in the associated technologies and marketing infrastructures. Summiteers noted that this synergy has largely deteriorated for most resource sectors, the initiative having moved decisively to the global level. They were broadly agreed also that this dynamic is having as many negative implications for Canada's historical manufacturing heartland as it is for the resource-producing regions.

***...a deteriorating synergy***

But there are significant exceptions that may indicate a re-balancing of innovative capabilities. In the oil & gas sector, for example, substantial new value is now generated by exports of advanced exploration, recovery and processing technologies that have been developed in the region, as well as by the now substantial international markets for western Canadian engineering and professional services. New ventures have been created also from technologies developed originally in the resource context but subsequently spun-out to other markets.

***...resource industries are also significant producers of new value***

On the whole, however, Summiteers did not regard the problems of the manufacturing industries (regardless of where they are located) to be mainly a consequence of external factors like energy prices or global competition. Rather, they observed that too much diversification in Canada since the 1960s has been in the direction of industry clusters in which the total level of value that might be added by indigenous Canadian companies is inherently limited – the auto industry being probably the most egregious example.

***...diversifying in the wrong directions***

Thus, all of Canada is hampered by policies that de-link resource commodity production from the industrial base and that prefer job stabilization strategies over value-added strategies. Summiteers were agreed that this holds all of us hostage-to-fortune as and when global conditions change.

***...emphasizing re-integration over job stabilization***

By the same token, however, many questions were raised about the continued viability of some of the resource industries themselves, even where the resources on which they are based were not depleted. In some parts of the region, for example, forestry and agricultural commodities are now economically marginal, sometimes because of foreign competition or trade barriers, but sometimes because of competition from producers in other parts of the region.

***...not all existing resource industry models are viable***

Clearly the future of these enterprises will not depend upon simple measures like lowering production costs, but on radically changing their relationships to the commodities they produce. Especially in these cases, it was agreed that the pervasive ‘rip-and-ship’ mentality as noted by one of the Summiteers was perhaps the biggest single obstacle to envisaging any such goals, let alone achieving them.

***...getting rid of the ‘rip-and-ship’ mentality***

Summiteers agreed that important as it was to upgrade the value directly from natural resources, it was just as important to innovate and diversify in areas that are not primarily linked to resources. In such cases it was noted that there are many opportunities to transfer knowledge and skills from the resource industries to new contexts that currently are not exploited and in some cases not even recognized.

***...transferring resource-based knowledge and skills to new contexts***

There was broad consensus that all innovation and diversification initiatives come down to risk. Here it was noted that resource enterprises are probably the most experienced risk-takers in our industrial fabric. Many regional financial institutions are especially experienced at

***...redirecting risk-taking capabilities***

financing and managing high-risk ventures. The issue as Summiteers saw it was to refocus the financial apparatus such that it is comfortable taking on new and unfamiliar sources of risk, both within the resource sectors themselves and concerning entirely new kinds of ventures.

It was acknowledged in this regard that government investments have been catalytic to almost every significant diversification effort in the region and that most of these initiatives have been successful. However, there was concern that too much emphasis was being placed on re-investing public income from resource royalties and not enough on leveraging the procurement power of resource industries as receptors for new products from new kinds of enterprises.

*...re-conceptualizing  
the role of  
government*

***In pursuing innovation and diversification goals, what advantages and disadvantages stem from our unique history as natural resource producers?***

***Advantages:***

Most of the educational, technical and management capabilities to innovate and diversify exist already in the region or can be accessed relatively easily by enterprises that stay in the region.

The resource industries are linked into an already diverse range of neighboring industries that are rooted in the region, offer wide scope for innovative entrepreneurial activity and have the potential to achieve global reach.

The region supports a growing pool of experience in creating successful globally-competitive high value-added enterprises.

Resource enterprises have extensive managerial experience and financial experience related to creating value from entrepreneurial risk.

The region has a limited, but mostly positive history of Government-industry articulation in structuring the development of large-scale innovation initiatives in the resource and allied industries.

***Disadvantages:***

With few exceptions, most Canadian resource sectors are no longer global technology leaders. Some have climbed down the value chain leading to questions about their viability.

Many historically productive linkages between the technology (capital goods), manufacturing and resource components of the Canadian economy have been allowed to disintegrate.

Since the 1960s, Federal governments and many Provincial governments have prioritized employment stabilization strategies over innovation strategies.

A 'rip-and-ship' mentality – a rush to take commodity prices at the lowest levels of added value – still dominates the resource industries.

Few mechanisms exist to encourage the transfer of knowledge and expertise from the resource sectors into new types of value-added enterprise.

## **The Second Conversation**

### **What do we mean by 'sustainable diversified' prosperity?**

#### ***Challenging the conventional wisdom:***

David Layzell (*Director of the Institute for Sustainable Energy, Environment & Economy at the University of Calgary*) challenged Summiters with a vision of what the industrial landscape of the western Provinces would have to look like if current levels of prosperity were to be sustained or increased. But he stressed that achieving this vision was linked critically to decisions that must be made almost immediately – within the next few months and years.

***...the urgent need for action***

Central to his vision of future prosperity was the evolving nature of our relationship with energy. Although the range and variety of natural resources in western Canada is vast, Dr Layzell argued that the fate of all of them was linked directly and inevitably to the fate of just one of them – namely, to the dynamics of world energy supply and its environmental implications.

***...energy is the key prosperity issue***

Thus, Dr Layzell's vision of a region in which diversified and sustainable prosperity is a reality, is a vision of a region that

***...a vision***

- will have built creatively and boldly upon its history as a resource producer;
- will have acquired new comparative advantages in world resource markets generally by embracing the energy challenges specifically;
- will be exploiting these challenges positively in order to leverage new investment in new capabilities that will transform the region into a *genuine resource superpower* – i.e. becoming at least as significant in defining *how* resources are extracted, processed and deployed as it is as a producer of resource commodities.

Dr Layzell envisaged the next 20 year period as one of intense innovation worldwide in virtually every industry, geared to mitigating recurrent crises in energy prices. This situation will define a 'brave new world' with which as yet no

***...coping with a 'brave new world'***

one has any experience. It will provide many new opportunities, but our resource industries will have to re-position themselves if they are to take advantage of them.

***...no silver bullet – silver ‘buckshot’***

This new world also will mandate much closer integration between every sector in the economy. For Dr Layzell, future policies and strategies will not accommodate the ‘silver bullet’ mentality. We will not be looking for ‘one big solution’ that will drive innovation and diversification. Instead, we will use ‘silver buckshot’ – the coordinated engagement of every sector in the region.

### ***Observations and insights:***

Summiteers agreed that any ‘vision’ of a diversified sustainable future that did not involve innovation across the entire industry spectrum was no vision at all. The necessity was to create a framework that would integrate and aggregate the value of these activities without creating cumbersome structures and rules that might inhibit innovation.

***... integration without inhibition***

But Summiteers were firm in their view that we should be realistic in evaluating where we are and how far we have to go. Recognizing that diversification necessarily would be the product of many different industries, they noted first of all that not all innovation in every industry would necessarily pull in the same direction. Innovators always look for new opportunities of a kind that usually destabilize existing industries and markets.

***...innovation is disruptive and not every industry will pull in the same direction***

This destabilization phenomenon occurs within the resource sectors themselves. For example, price volatility for fossil fuels when coupled with climate change in the arctic suggests new entrepreneurial opportunities to exploit polar oil reserves at more competitive costs. It also opens up the possibility of exploiting methane hydrates as a source of natural gas for the first time. But the immediate impacts of such developments in our region may be to deflect investment from bitumen processing, where we now have a decided comparative advantage in technology and know-how, to activities where our advantage is far less exclusive, or where we may have no advantage at all.

***...we cannot count on established comparative advantages***

It was noted also that innovation is not always the same thing as diversification and that it does not always lead to diversification in the sense of spawning entirely new industries. Particularly in the resource sector, many observed that innovation mostly occurs within existing

***...not all innovation is diversification – it occurs within value chains too***

processes driven mainly by competitive pressures on producers. Thus, it is more often the case that these innovations or their spin-offs are not exploited outside of the specific supply or value chain that generated them in the first place.

For most resource enterprises, diversification implies moving into additional or alternative product streams. This can involve new ways of exploiting existing resources, e.g. upgrading. Or it can involve the substitution of one resource with another, e.g. substituting bio-fuels for petroleum, or using hydrogen from nuclear power plants instead of hydrogen from reformed methane. In yet other cases, it can involve the commercialization of new technologies as products in their own right.

***...additional and alternative streams***

One of the key concerns of Summiteers in this regard was that already there have been many previous opportunities to diversify in the region that had not been taken up. There were also cases where diversification had been promoted for the wrong reasons with the wrong technology. In the case of forestry, diversification into processing and forest management technologies was even reversed. As prices for raw timber rose, the incentive to innovate and diversify receded and our technological leadership was lost.

***...failures to exploit previous opportunities***

Thus, Summiteers expressed concern about the actual commitment to innovation and diversification, over and above the ubiquitous rhetoric from both government and industry. Blunt questions were posed as to why the region would choose to pursue a vision based upon diversification. Mostly these boiled down to one motivating question: *'What is it that we actually want that can come only from diversification?'*

***...do we have realistic goals?***

Summiteers offered a variety of responses. Some saw diversification mainly as a hedge against risk – as a way of increasing the number of options in an ever changing world. But others suggested that the real benefits from diversification were more indirect, linked to maintaining a quality of life in the region that would generate opportunities.

***...to 'hedge' or to create a better 'quality of life'?***

There was general agreement that whatever its strategic advantages might be, diversification was always the key to attracting the range of individuals, enterprises, resources and skills required to make a region attractive as a place for people to live and prosper. To paraphrase one Summiteer, bright, highly motivated people naturally seek out environments where things can happen, as defined by the

***...diversification is a talent attractor***

presence of other bright, highly motivated people.

Summiteers also grappled with the strategic issues of how to stimulate opportunities and prioritize human and financial resources. Many were of the opinion that a greater emphasis on life-cycle analysis would strengthen our strategic outlook in terms of integrating our resource base with our entrepreneurial sector. This would involve looking at changes in the costs of key elements in the resource production systems as new technologies, scientific discoveries, regulations, social pressures and alternatives (conventional or unconventional) came on stream.

***... need to improve strategic planning capabilities***

If applied routinely, Summiteers were agreed that various forms of futures analysis – life cycle, foresight, road-mapping etc. – could be very effective at turning ‘threats’ to existing practice into the kinds of entrepreneurial opportunities that would underpin the vision. But they also questioned whether at this point the region has the human resources to apply such a strategy.

Summiteers were agreed that achieving the vision of a diversified sustainable future will involve learning to think about innovation and diversification opportunities in new ways. They noted especially the need for parallel thinking – e.g. the ability to envisage the energy problem also as a water problem, a transport infrastructure problem, an urban planning problem, and an educational problem. They stressed also the need to think about solutions ‘at scale’ – to ‘think big’ about the whole solution – and then to *act* at scale – e.g. to change the paradigm for energy and other resource consumption strategies by linking them more directly and aggressively to urban planning, small business support and knowledge transfer strategies.

***...imperative for parallel thinking***

***...imperative to think at the scale of the problem***

In the end, Summiteers concurred that innovation is a contact sport. The vision set out by Dr Layzell was achievable, but only by breaking down silos, learning to think in new paradigms and working in collaborative structures which could involve inter-industry, inter-provincial and inter-national consortia.

***...innovation is a ‘contact sport’***

### ***What can we not do well today that we must be able to do extremely well in 10 years?***

We must achieve the ability to convert threats to our resource-based wealth into opportunities to innovate and diversify.

We must achieve a high degree of coordination and parallel thinking across the region that encompasses both the entire industrial spectrum and the various



administrative jurisdictions.

We must develop a sophisticated futures capability employing foresight and life cycle assessments.

We must be in a position where no resource industry in the region is going backwards in the value chain.

## II. Making the Transitions

### The Third Conversation:

**Should we follow the most well-travelled pathways?**

#### ***Challenging the conventional wisdom:***

It is usually assumed that the most straightforward way to innovate and create new levels of value from natural resources is to diversify into adjacent industries. Thus, agriculture moves toward bio-fuels, forestry to fibres and oil & gas to chemicals. Jeremy Hall (*Associate Professor, Faculty of Business Administration, Simon Fraser University*) saw many opportunities for this strategy in the region, but challenged Summiteers to abandon the idea that we have any natural advantages in pursuing these transitions.

***...we have no natural advantages***

In trying to benchmark our performance in innovation and diversification, we are used to comparing ourselves to regions that have roughly similar socio-economic characteristics to our own. In contrast, by drawing upon his extensive knowledge of industrial transformation in Brazil, Dr Hall illustrated the many challenges inherent in exploiting neighbouring value-added strategies in a fresh and vivid way. Brazil has very different socio-economic characteristics, but nevertheless has a 20-30 year head-start on us when it comes to bio-fuel technology and is already a major competitor to Canada in several high value-added and high-technology industries (e.g. automobiles and aerospace).

***...we may be benchmarking ourselves against the wrong models***

Dr Hall stressed that there are dangers should we come to depend too heavily or exclusively upon the most closely adjacent opportunities in order to innovate and diversify. As most of our peer economic regions are not significant producers of natural resources (apart from agricultural commodities), the competition we face with such a strategy may well come from ambitious countries like Brazil. Several such countries can now keep pace with or surpass our production of raw-materials, while at the same time being

***...competition will come from new and unanticipated sources***

able to develop their own base of advanced technologies for transforming and upgrading these materials.

**Observations and insights:**

Summiteers were generally agreed that no region can be good at everything and that inevitably there would be a tendency to exploit closely neighbouring diversification opportunities before exploiting more distant goals. In this respect, the resource endowment does sustain a powerful path dependency that may not be possible, or advisable, to circumvent. However, Summiteers noted also that this path dependency presented several quite different kinds of neighbouring opportunities.

*...allowing for path dependencies*

Resource enterprises can climb *existing value chains* and add the same kinds of value to the same commodities as are added in other regions, as when raw timber is turned into dimensioned lumber. They can also enter *closely neighbouring value chains*, as when agricultural commodities are diverted from consumption as food to consumption as fuel. Or they can create *new chains*, as for example occurred when we began to manufacture oil from sand.

*...climbing many value chains*

Likewise for non-resource industries, Summiteers noted that the most immediately attractive opportunities in resource-producing regions would include opportunities to sell existing products or services to resource companies, to adapt their product profiles for this market, or to develop entirely new products and services.

*...new entrants to resource markets*

In grappling with the problem of how to understand which paths will be chosen by various resource and non-resource enterprises, Summiteers agreed that in one crucial respect no closely neighbouring opportunity to add value is ever wholly 'conventional'. This is because every action to innovate and diversify has *unforeseen* or *unintended* outcomes.

*...no diversification opportunity is ever really 'conventional'*

They speculated that whether in western Canada or Brazil, the ultimate source of advantage would come from being able to recognize and respond to these *additional* opportunities that usually emerge whenever enterprises choose to change positions in their existing value-chains.

Two significant examples were explored of how experience with a commodity at the production level could be multiplied successfully into a much higher value relationship, even though the product itself did not change. It was noted that

*...climbing the value chain by anchoring markets*

the global marketplace for beer was now anchored in Belgium, even though Belgian brewers themselves produced only a tiny proportion of global output. Similarly, the Netherlands anchors the global market for ornamental horticultural products, even though production of these commodities has now shifted decisively offshore.

Both of these examples demonstrated for Summiteers how a local reputation for producing and marketing a particular commodity could be leveraged into a globally dominant *business* position independently of domestic production capacity. Many were of the view that because of our historical position as price takers with respect to resource commodities, our business culture may not be attuned closely enough to such price *making* opportunities.

***...levering a production capability into a market-making opportunity***

Summiteers also engaged in a lively debate as to whether the decisive advantage in innovation and diversification stemmed from convergence upon global trends and 'best practice' or from *divergence*. Most were agreed that although much can be learned by observing other jurisdictions, there are no magic models to copy. Successful jurisdictions tend to be so because they have developed models that suit their particular socio-economic histories and characteristics – so must we.

***...diverging from 'best practice'***

Following this line, Summiteers were generally positive that many of the best opportunities for innovators in our region have arisen in the least expected places. They noted that especially for smaller entrepreneurial companies, some of the biggest successes have occurred where barriers to entry are the highest and where no one expects a competitor from this region to emerge, let alone succeed.

***...the strategic advantage of coming out of nowhere***

Moreover, referring back to the Belgian and Dutch examples, many of the innovations underpinning these entrepreneurial opportunities have not involved new technology (or not exclusively), but rather new business models and arbitrating structures aimed at placing resource commodities from western Canada in new markets in new ways.

***...new business models over new technology***

Many Summiteers stressed the essential requirement for adaptability, noting that those resource sectors that have become less viable in the region are precisely those that have climbed *down* the value chain – e.g. by getting out of R&D or by not exploring alternative markets and associated diversification opportunities.

***...going down the value chain is not an option***

Others cautioned in this regard that aggressive applications

of economies-of-scale doctrines in regions like ours may actually stifle innovation. Summiteers recognized the importance of developing a more diversified range of large companies in the region, but questioned whether it was really necessary to grow very many companies to high capitalization levels in order to exploit emerging niches effectively.

*...it may not be necessary to grow many large enterprises*

### ***How can the addition of new value to our natural resources best contribute to achieving the vision?***

Look for the unintended consequences of climbing a value chain, or switching to a nearly adjacent chain – exploit the additional opportunities that emerge whenever enterprises change position in a value chain.

By developing innovative business models, multiply experience with production into the ability to make rather than take prices.

Create opportunities within existing value chains by diverging from global norms.

Promote agility over firm size and economies of scale.

Don't assume that you have to change the product in order to add value to it.

### **The Fourth Conversation:**

#### **Can and should we do the completely unexpected?**

#### ***Challenging the conventional wisdom:***

The other routes to diversification involve doing things that have no necessary association with any particular region or historical industrial capability. Peter Phillips (*Professor and Head of the Department of Political Studies, University of Saskatchewan*) challenged Summiteers not to underestimate this strategy, but to consider that the success or failure of such ventures is likely going to be linked also in some way to our natural resources.

*...even radical shifts to new industries cannot avoid linkage with the resource base*

Dr Phillips observed that historically our diversification options have been perceived in terms of three more-or-less alternative scenarios:

*Firstly*, we can simply move from one resource pool to another as each successive pool is depleted. This strategy requires the lowest amount of intervention by governments and only minimal strategic reorientation by companies, but it also has the lowest long term yield.

*...some common alternative scenarios*

*Secondly*, we can add new forms of value, both upstream and downstream of our core resources. But

historically this has left us hostage to fortune; either vulnerable to declines in the economic viability of the core resource, or victims of competition from lower cost producers.

*Thirdly*, we can invest in entirely new activities that have no fixed or exclusive relationship to our resource base. To some extent, the risks can be mitigated by spreading our 'bets' in diverse investment portfolios.

This third strategy is usually associated with transitions to higher technology industries. It has yielded many successes in our region, but it has also typically required the highest amount of public investment. But often it is debatable whether an equivalent public investment in the resource base itself would have yielded equal or greater returns.

Dr Phillips proposed that there is actually a *fourth option* – namely to capture some of the advantages of each of the above options as part of an integrated transition strategy. He pointed out that most of the region's success stories – in terms of ventures that eventually found independently sustainable global markets – began life in markets associated with the resource industries. In most cases, their independence was gained by exploiting those parts of the value chain that are not as vulnerable to outside forces – e.g. product differentiation, business model franchising or the development of high-value niches in global supply systems.

*...the 'fourth option'*

Dr Phillips proposed that achieving these outcomes is dependent less upon specific measures aimed at specific industries or technologies, and more upon general initiatives to transform the region into an 'innovative culture' which rewards risk taking, mitigates failures and penalizes complacency.

*...building an innovative culture*

### ***Observations and insights:***

Throughout their previous discussions, Summiteers frequently noted the linkage between competitive advantage and doing the unexpected. Many historical examples were given of radical transformations that originated in obscure places. Edinburgh was the least likely origin for the ideas that led to the 'Enlightenment'. Minneapolis was the least likely place to emerge as a center for super computing. Korea is a country that diversified successfully and quickly by always doing well what experts nearly always said they had no business doing at all.

*...the need to do the unexpected*

But Summiteers conceded that this so-called 'black swan' effect presented major difficulties for policy and strategy. Opportunities to do more with what you already have are like 'white swans'. They are predictable so to some degree and it is at least possible to plan for them and to set priorities. Breakthroughs are 'black swans'. They are virtually impossible to anticipate and usually cannot be stimulated or managed in any pre-existing framework. At the same time, however, black swans can yield enormous returns rapidly and create critical knowledge niches that, arguably, are easier to secure and sustain in the particular locale where the swan first appeared.

***...breakthroughs  
create knowledge  
niches that stick***

This problem focussed the attention of Summiteers upon the organizational and institutional framework that surrounds innovation and diversification objectives, both in the western Provinces and nationally. In the private sector, Summiteers noted that the highly distributed nature of incremental innovations among many companies in a typical resource project created significant knowledge capture and management problems for resource companies. In the public sector, they noted that although there was a vast array of agencies and programs, few if any of them seemed to be oriented towards the unique dynamics of innovation and diversification in resource-rich regions.

***...resource  
industries offer a  
special knowledge  
management  
challenge***

Assuming that resource development is not incompatible with innovation and diversification, Summiteers noted many discrepancies between how they observed these dynamics to operate and what they saw in both public and private sector initiatives intended to stimulate innovation and diversification. Summiteers stopped short of offering prescriptions, instead noting where at some point prescriptions may be needed.

***...innovation  
programs and  
agencies are not  
oriented to the  
special challenges  
posed by resource  
industries***

The first issue harkened back to the discussion about convergence or divergence. The converged global view as to what innovation and diversification are and how they can best be achieved revolves very much around industries that produce technology goods. Most of these industries are R&D intensive and most of their business models involve the exploitation of discrete Intellectual Property Rights (IPR), usually in venture capital portfolios.

***...resource  
industries are not  
IPR oriented***

Summiteers pointed out that although certainly enterprises in western Canada have shown that they can succeed in this paradigm, the attributes of this region bestow no special advantages upon them. And indeed, many noted that the

***...innovation  
initiatives that  
involve the resource***

most ubiquitous business model for local entrepreneurs is to sell out quickly to interests outside the region. However, opportunities to innovate and diversify that involve relationships with resource-based industries cannot be shifted out of the region as easily.

***sector are more likely to stick in the region***

Because of the dispersed and relatively uncoordinated nature of much of the innovation in resource industries, the overall pace at which new ideas are applied can seem slow and haphazard. Moreover, the overall capacity of the industry to detect and diffuse these changes at an industry-wide scale is limited. The pattern is one of continual trial-and-error, resulting in a steady stream of incremental improvements in efficiency and productivity, punctuated by significant but infrequent shifts.

***...innovation is mainly incremental and haphazard***

Summiteers noted that this is *not* an ideal environment for the quick-return hi-tech venture capital models of the 1980s and 1990s. Technology acquisition in resource industries comes more thorough procurement than through R&D and few segments of these industries operate business models oriented to the exploitation of patents. To the extent that public sector initiatives to promote innovation are focussed mainly upon R&D and patenting strategies, they may be ill equipped to spot and exploit diversification opportunities that emerge within and around the resource sectors.

***...hi-tech venture capital models are inappropriate***

Summiteers were broadly agreed that in order to pursue Peter Phillips' integrated 'fourth strategy', it would be necessary to build a much more broadly based innovative *culture* in the region. However, they were clear that building such a culture was not just a matter of letting every flower bloom. Rather it would require concerted action at three levels.

***...need for concerted action***

First, at the level of individual entrepreneurial enterprises, bold departures from accepted practice may be necessary. Particularly regarding public sector initiatives, Summiteers noted troubling discrepancies between the management and accountability regimes that were emerging in this environment and the very nature of entrepreneurship. Although all recognized the need for reasonable accountability, they recognized also that the fastest way to kill off innovative initiatives is to impose an accountability regime that is geared more to companies in stable existing markets rather than in inherently unstable emerging ones. Summiteers from industry in noted that innovators will never behave the way accountants want them to, and that the increasing Return-On-Investment emphasis of public policy

***...innovators never conform well to norms of accountability and ROI***

is counterproductive given the unpredictable and often lengthy lead-times required to translate new ideas into viable commercial implementations.

A positive alternative could be to focus more upon the project management aspect of entrepreneurial enterprises. Summiteers observed that an innovative culture would require many types of creativity and that different ‘creatives’ are needed at different stages of the business-making process. All were agreed that the inventor is most often *not* the person best able to take the idea to market. Others suggested more emphasis on risk mitigation strategies – using project management to keep failures small, and, where necessary, to wind non-viable ventures up before they fail outright, perhaps transferring their knowledge assets to other ventures.

***... an innovative culture requires many kinds of creativity***

At a second level, Summiteers observed that more coordination will be required *between* innovative enterprises. They noted that most government initiatives tended to focus upon individual enterprises and specific new ideas, often in an environment oriented to creating temporary knowledge monopolies involving IPR. If a venture fails, and many do, the knowledge is often lost. In more open consortium constructions (including funders, research services providers and implementing companies), there are many more opportunities to learn from failures and build upon successes.

***...effective knowledge coordination is often inhibited by IPR***

One Summiteer likened the issue to a waste management problem – suggesting that we need to enhance our ability to recycle good ideas whose time has not yet come. In this respect, Summiteers emphasized the value of talent aggregation and creating large pools of ideas that are attached more to ‘know-how’ than to IPR. This would help ensure that good ideas do not disappear just because they are not exploited quickly enough.

***...coordination keeps good ideas circulating***

At a third level, however, Summiteers proposed that we should be far less averse in the region to organizing our skills and resources around some ‘big ideas’ that would attract substantial amounts of both public and private finance and would encompass an inherently diverse range of knowledge and skills. In the resource context, big ideas about environmental and logistical issues could be prime candidates. Summiteers noted that such strategies were pursued with vigour in every jurisdiction around the world which we compete or hope to compete. But they encouraged stakeholders not to view these ‘flagship’

***...engines of growth – organizing around ‘big ideas’***

***...flagships to stimulate innovation across the industry***



initiatives as self-standing projects, but rather as engines of growth that could stimulate entrepreneurship across a wide cross-section of industries.

*spectrum*

At all levels, there was wide agreement that the focus of innovation and diversification strategies needs to change at some point from far upstream to further downstream. Basic research and the 'R' part of R&D are essential, but they also involve rather modest resources and are inherently low risk, especially politically. All were agreed that innovation and diversification strategies need to focus much more on the 'D' part of R&D which is where new markets are created. Summiteers were agreed that although this is politically risky, it is also the only political investment that really pays off over the long haul.

*...moving the strategic focus downstream – focusing on the 'D' in R&D*

Thus, the discussion culminated in general agreement that creating opportunities to build a sustainable base of diverse and innovative enterprises that will stick and prosper in our particular region will likely involve measures that *diverge* from some of the currently accepted norms, and that play more to the unique industrial environment of this region.

*...playing to our unique industry environment*

### ***How can we gear up to do the completely unexpected?***

Ground the institutional support mechanisms for innovation and diversification in the dominant industrial characteristics of the region's resource industries rather than in the characteristics of industries that are not yet rooted in the region.

Do not expect high-risk entrepreneurial enterprises to meet the same accountability requirements as established enterprises in mature markets.

Enhance the knowledge transfer environment between companies outside of the R&D and IPR milieu.

Choose a few 'big ideas' that will ensure the future of the resource industries while at the same time delivering high potential to become 'engines of growth' – to encourage innovation in a broad range of complementary industry sectors.

Focus public support more on downstream market-making than on upstream research and invention.