The Alberta Genuine Progress Indicator (GPI) Accounts

A Blueprint for the Way We Really Live

“The GNP (gross national product) measures everything...except that which makes life worthwhile”

Robert Kennedy

For distribution and comments

July 4, 2000

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New Study to Measure Genuine Progress and Sustainability of Alberta

Dear Reviewer:

We are pleased to submit for your review and commentary a proposed blueprint for the development of Genuine Progress Indicator (GPI) Accounts for Alberta. We welcome your input at this first stage of the project.

The Pembina Institute, in partnership with Western Economic Diversification Canada (WD), has begun an ambitious research and development project to establish indicators and measure the genuine economic well-being and sustainability of the values Albertans consider most important to their quality of life. The project will develop a Genuine Progress Indicators (GPI) accounting framework that can assess and monitor long-term trends (1960 to 2000) in the overall well-being of Alberta’s households and the environment. The GPI Accounts will yield a set of indicators that show changes in the values most important to Albertans. In addition, the GPI Accounts will provide a more complete set of “economic books” that show the monetary value of Alberta’s most important assets and liabilities along with an analysis of the full costs and benefits associated with those issues that makes life worthwhile. The research, funded by WD, will be undertaken over the next six months by the Pembina Institute’s Green Economics team: Mark Anielski, Stephanie Cairns, Barbara Campbell, Mary Griffiths, David Pollock, Amy Taylor, Sara Wilson and Jeff Wilson.

This leading edge work is an ambitious and unique approach to accounting for sustainability and the well-being of our community. Traditional measures of economic progress, like the GDP (gross domestic product), simply considers the monetary transactions in our economy and tell us little about the genuine well-being of our households (oikos – the root of the word economics) or of nature. In a perverse manner, environmental and social costs, such as the Exxon Valdez oil spill, the Montreal ice storm, and more prisons, actually contribute to a rise in GDP as money changes hands. Environmental and social costs are ignored in the GDP, as is the depreciation costs of depleting oil, gas, and forest resources. As Robert Kennedy once remarked, ‘the GDP measures everything except that which makes life worthwhile.’

The result of this project will be a set of Genuine Progress Indicator (GPI) Accounts for Alberta that will show the overall “state” (in terms of physical and monetary aspects) of our human, social, environmental (natural) and produced (built, financial) capital or wealth. Mark Anielski, Director of the Pembina Institute’s Green Economics Program and co-author of the 1999 US GPI through Redefining Progress (San Francisco), will be leading the work. The Alberta GPI project will build on the experience gained with the US GPI work. We expect to advance the US work to a new level by constructing a ‘balance sheet’ and ‘income statement’ for human, social, environmental and economic, or produced capital (wealth). For example, we plan to examine a wide range of factors that contribute to or detract from the well-being of individuals, society and the environment. Such things as the value of volunteer time, the costs of crime, family breakdown, sustainable forest use, air pollution, and many more values that are currently ignored in the provincial GDP figures. Our Green Economics team will be consulting with Dr. Ron Colman of GPI Atlantic, Statistics Canada, and Alberta government agencies throughout the project.

Data for the Alberta GPI accounts will be drawn from publicly available sources including the Alberta Government, Statistics Canada, academic research and other sources. The project will engage experts, such as yourself, from various disciplines.
Upon completion, this pilot Alberta GPI Account could set an important international benchmark for accounting for the sustainability of the wealth of nations. We feel it’s time the households of the nation had a more accurate account of their well-being, as they experience life.

We would like your reaction and comments on the first phase of this project – the “blueprint” for the Alberta GPI Accounts – and welcome your input and comments as part of a multi-stakeholder, trans-disciplinary research initiative. We would be grateful for your suggestions for improving the GPI “blueprint” as well as identifying sources of information, relevant research studies or suggestions for other contacts with expertise in specific areas of the GPI Accounts (for example, crime, family breakdown, wealth inequality, or air quality). Once the GPI blueprint is developed we will begin construction of the Alberta GPI Accounts to be completed by December 31, 2000.

Please provide your commentary to Mark Anielski by August 31, 2000 either by:
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Sincerely,

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A Blueprint for the Development of Genuine Progress Indicator (GPI) Accounts to Measure Sustainability for Alberta.

About The GPI Report

The Alberta Genuine Progress Indicators (GPI) Accounts is a report to Albertans about the trends in the state or condition of economic, environmental and societal well-being or quality of life over the last 40 years: 1960 to 2000. The GPI Accounts provide indicators to address the question: How has the quality of life changed in Alberta over the past 40 years and are we on a sustainable path? The Alberta GPI is compromised of inter-related “indicator accounts” that track the trends in the qualitative and economic dimensions (full benefits and costs) of environmental, economic and social issues that collectively constitute quality of life for Albertans. The second purpose of the GPI is to develop a measurement framework for assessing progress towards the goals of sustainable development – living today in a fashion that does not compromise the well-being of future generations. Defining and measuring quality of life and sustainable living are complex issues. We, at the Pembina Institute, believe that such an accounting is possible recognizing that all dimensions of quality of life are interrelated in a complex web or system. Thus the GPI accounts are meant to provide a snap shot of the “state of Alberta” as experienced by Albertans in the most transparent way possible and in a fashion that recognizes the interrelated nature of all issues through a systems approach to accounting.

The GPI Accounts provides a “baby step” towards the development of a systems approach—holistic mirrors—for accounting for economic, social and environmental well-being over the past 50 or so years of progress. We can thus look in the “GPI mirror” and ask: Are we better or worse off in 1999 than we were a year ago or in 1960? How has our quality of life changed in 40 years? What is the condition of our environment and the state of our natural capital assets? Are we on a sustainable or unsustainable path? How are we using our most precious resource, time? Looking into the mirror of the past allows us to determine where we might be heading in the future—beyond 2005, Alberta’s 100th birthday. What legacy are we leaving to our grandchildren and their children? Will they inherit conditions that are better or worse than what we enjoy today in the year 2000? While 20-20 foresight is impossible we can at least use the GPI Accounts to consider the “what if” questions of the future.

Introduction

The Alberta Genuine Progress Indicators (GPI) Accounts are meant as a tool for accounting for the trends in the condition of the households, businesses, communities and environment of Alberta, as well as the full economic costs and benefits associated with use of human, manufactured, financial, social and natural capital. The purpose of the GPI Accounts is to provide a full accounting of the trends and costs or benefits associated with the condition or well-being of individuals, households, communities, business and the natural environment. The GPI is an accounting of the original meaning of the word economy.

The Meaning of Economy

The word “economy” comes from the Greek word “oikonomia” (oikos- household; nomos- managing). The dictionary defines economy as:

1) the management of the income, expenditures, etc. of a household, private business, community or government;
2) careful management of wealth, resources, etc.; avoidance of waste by careful planning and use; thrift or thrifty use b) efficient use of one’s materials, technique, etc.'
We could easily extend this definition of economy to include the careful management of the environment and natural resource assets. Thus economics should be concerned with assessing the trends in the frugal (efficient) and careful (effective) management of the human, social, manufactured, money (financial), and natural capital of a community. Some might argue that economics has strayed far from the letter and spirit of the Greek word “economy.”

It is noteworthy to contrast the “oikonomia” with another Greek work which Aristotle called “chrematistics” – “the study of wealth or a particular theory of wealth as measure by money.” Yet you won’t find the word chremastics in most modern dictionaries. This is ironic since we might observe that much of economic research is concerned with the study of money flows in an economy (economic growth (GDP), consumption, trade, financial markets) than with a study of the conditions of the management of households and the environment.

Economist Herman Daly and theologian John Cobb Jr. remind us that:

“It (chrematistics) can be defined as the branch of political economy relating to the manipulation of property and wealth so as to maximize short-term monetary exchange value to the owner. Oikonomia, by contrast, is the management of the household so as to increase its use value to all members of the household over the long run. If we extend the scope of the household to include the larger community of the land, of shared values, resources, biomes, institutions, language, and history, then we have a good definition of ‘economics for community.’” (Daly and Cobb, 1994; 138)

The term economy is thus not about measuring the total monetary value of market goods and services exchanged, as expressed in economic indicators like the GDP (gross domestic product), but about measuring the efficient and effective use of scare human, household and environmental resources – time, household infrastructure, and natural resources.

**Shortcomings of GDP**

The GDP or gross domestic product is the broadest measure of the economic well-being of an economy. The GDP measures the total money value of market goods and services exchanged in a community or nation. It does a great job of accounting for all the money changing hands one year to the next but provides little insight into changes in the true economic condition of households. The GDP thus aligns with the term “chrematistic”, however, it fails to account for the condition and management of the households and environment of a nation. By adding up the monetary transactions in an economy and calling this progress or prosperity obscures an honest accounting of the quality of life and the state of the environment.

Former Senator Robert Kennedy, just prior to his assassination in 1968, summed up the shortcomings of the GNP/GDP best:

“The Gross National Product [and GDP] includes air pollution and advertising for cigarettes, and ambulance to clear our highways of carnage. It counts special locks for our doors, and jails for the people who break them. GNP includes the destruction of the redwoods and the death of Lake Superior. It grows with the production of napalm and missiles and nuclear warheads... And if GNP includes all this, there is much that it does not comprehend. It does not allow for the health of our families, the quality of their education, or the joy of their play. It is indifferent to the decency of our factories and the safety of our streets alike. It does not include the beauty of our poetry or the strength of our marriages, or the intelligence of our public debate or the integrity of our public officials... GNP measures neither our wit nor our courage, neither our wisdom nor our learning, neither our compassion nor our devotion to our country. It measures everything, in short, except that which makes life worthwhile.”
In fairness to those economists that helped develop the GDP, and the System on National Accounts from which the GDP is derived, have long recognized the shortcomings of the GDP as a measure or index of economic well-being. Former economist Simon Kuznets, who won the 1971 Nobel Prize in economics, was at the forefront of development national income accounts and GDP accounting following World War II cautioned in 1965 that:

“the welfare of a nation can scarcely be inferred from a measurement of national income as defined by the GNP...goals for ‘more’ growth should specify of what and for what.”

Former New Zealand Finance Minister and economist Marilyn Waring who has spent years studying the history of the United Nation’s System of National Accounts (UNSNA) presents an stinging indictment of those who use the GDP as a measure of economic progress:

“The successful transmission of propaganda relies heavily on cliché or rhetoric...Mathematical, mechanical and medical anxieties, and other mystifications may represent a deliberate obfuscation; an effort to remove the discipline and its information from the powerless. Such political exclusivity is also useful to disguise vulnerability and to keep from telling the truth. They (people) have heard terms like national income, balance of payments, Gross National Product (GNP) and Gross Domestic Product (GDP), used with seeming alacrity by businessmen, politicans and newspaper editors…it is my distinct impression that, with the exception of those trained in economics, most of these people don’t know what they’re talking about. They bluff it, reliant on human nature, intimidation, and embarrassment to silence those who might be curious to ask just what the national income is.”

Despite these voices of the past and present, the GDP continues to be used as the bragging rights of every nation when comparing national levels of income and economic prosperity. Yet, the GDP embodies many shortcomings:

1) The GDP fails to distinguish between the full costs and benefits of economic activity. It regards every expenditure as an addition to well-being, regardless what that expenditure is for and the effects. By this reasoning an economic hero is a terminal cancer patient going through an expensive divorce, whose car is totaled in a twenty-car pile-up. Also, the costs of cleaning up after an environmental calamity, such as the Montreal ice storm boosts, the provincial and national GDP figures. The economic villain is the healthy person in a solid marriage that cooks at home, walks to work and doesn’t smoke or gamble.

2) The GDP ignores and excludes the functions of the household that lie outside the realm of monetary exchange. GDP excludes the value of the time spent at unpaid housework, childcare, eldercare, volunteer work, and leisure. In the GDP figures these expenditures of life-energy (time) count for nothing, even though they are vital to our well-being and quality of life. Yet when we spend money on daycare for our children, house cleaning services, and eldercare services for our aging parents from the market place this increases the GDP. Paradoxically, the cannibalizing of our life energy (time) and quality of life actually increases economic growth, as measured by the GDP. The GDP growth since the 1960s might actually have come from increased trading of unpaid work time (particularly by women) for money and the replacing these household management services with paid services by other workers. While economic growth is recorded, in reality there may have been no increase in the well-being and quality of life of households as people have less quality time with their children, elders and friends.

3) The GDP does not account for the value and depreciation of natural resources and the environment required to sustain current and future economic well-being. As such, inventories of natural resources and the value of natural resources and environmental services count for nothing in the GDP and national income accounts. The GDP ignores the long-term costs of environmental degradation with a focus only on the present consumption of natural capital. The GDP counts the depletion of natural
resources as current income rather than as the liquidation of an asset. Most companies would be out of business if they did not account for the depreciation of their assets. Thus treating natural capital in this manner violates both basic accounting principles and common sense. Furthermore, if the depreciation of natural capital is ignored this does not provide signals to the market that investment in sustaining renewable natural resources is important. Ignoring the depreciation of non-renewable natural resources (oil, gas, coal) also violates basic accounting principles for treatment of assets. Not reinvesting some of the revenues from a finite, nonrenewable resource asset into savings or alternative, sustainable forms of capital will also compromise the incomes of future generations.

4) **The GDP ignores totally the distribution of income, the social costs of inequality and poverty.** Changes in GDP are insensitive to income inequality, poverty and the distribution of personal consumption and wealth. A rising GDP may obscure who is benefiting most from economic growth. We often assume that if an economy is getting bigger all households are benefiting equally.

5) **The GDP contains regrettable intermediate expenditures that do not necessarily contribute to economic welfare.** For example, costs related to crime, auto accidents, commuting to work, and spending on divorce lawyers may be viewed as regrettable expenditures even though they add to the GDP. Government spending, termed “intermediate expenditures”, such as military spending, environmental protection, and spending on prisons may also be viewed as regrettable or not contributing to economic well-being.

6) **The GDP includes expenditures on education, health care, social services and environmental protection that do not necessarily reflect the outcomes or returns on investment from such expenditures.** Such outcomes might include physical well-being (e.g., life expectancy), intellectual and labor market skills, educational attainment, and the quality of the environment.

7) **The GDP does not directly measure the benefits of investment in household, public and social capital.** Social capital includes the investments in the health and wellness of communities, social institutions, and democratic processes.
1. Introduction

Robert Kennedy once noted that the primary economic measure of prosperity, the GDP (gross domestic product) “measures everything except that which makes life worthwhile.” The word economy comes from the Greek oikonomia meaning literally the management of the household (oikos). Economics should thus be concerned with the quality of the lives of families and households. Aristotle made a clear distinction between oikonomia and chrematistics—the science of the wealth of nations (political economy) as expressed in terms of money. Based on the original definition, an economista is literally a housekeeper or one who is concerned about the thrifty and effective management of the household, including time, money, and the land (garden) and natural resources. In contrast, a chrematist (a political economist) is one who studies the science of wealth, including trade and money.\(^1\) This leads us to ask whether economics today is out of touch with understanding the well-being of the household while more concerned with chrematistics, that is the growth and management of money, wealth, production, and consumption.

Is it not time that we account for the genuine well-being of our households and families as we actually experience life? The goal of the Alberta Genuine Progress Indicators (GPI) project is to begin the development of measurement or accounting system (well-being accounts) that would reflect the actual state of our households and the surrounding natural environment. That is, an account of how we are managing income, but also time, (life-energy), intellectual capital, and natural resources. The vision of the Alberta GPI Accounts project is a comprehensive, practical and policy-relevant accounting framework for measuring the well-being and sustainable development of Alberta households.

Terms like “sustainable development” — development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs — and “quality of life” present considerable measurement challenges. In general, we lack a conceptual and practical model or system for accounting for quality of life and for the sustainability of both economy, environment, and society (community). This is partly due to lack of a common vision and definition for quality of life and sustainability; not surprising given that quality of life is defined in the eye of the beholder. Despite such challenges we can make progress towards a measurement system that assesses the state (and trends) of key variables that constitute quality of life and well-being of both the economy and the environment.

The Alberta GPI Accounts project is a first step towards such a well-being and sustainability measurement system. The project entails two major parts: 1) a conceptual “blueprint” for measuring sustainability and well-being, and; 2) a set of accounts that reveal the physical (quantitative and qualitative) and monetary values (costs and benefits) of human, social, natural, and produced (manufactured) capital or wealth. This requires a complete set of “books” or accounts to track Alberta’s genuine well-being and sustainable progress. The Alberta GPI Accounts hope to provide citizens with a “big picture” perspective on their genuine state of well-being, in accordance with their values and life experiences.

The Alberta GPI Accounts project is sponsored by Western Economic Diversification and will be completed by December 31, 2000.

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\(^1\) Chrematist is a rare word (as rare as chrematistic, 1752) that dates back to its earliest use 1845, though the word is of Greek origins and is attributed to Aristotle (see Shorter Oxford English Dictionary (1955)).
2. Background

The word economics comes from the Greek word “oikonomia”, which refers to study of the well-being and stewardship of the household, habitat or natural environment. Aristotle distinguished “oikonomia” from “chrematistics” (almost forgotten in modern dictionaries) which refers to the study of wealth or a particular theory of wealth as measured by money. For more than 50 years we have measured economic well-being using inadequate measures such as the GDP (gross domestic product)—a measure of the flow of monetary transactions in our economy. What we lack is a more complete account of the well-being of the economy, environment and our households in community (society). Most of our economic and fiscal policy is oriented towards management of money and finance and not what might be called “living capital.” The goal of the Alberta GPI Account is to understand the genuine state of “oikonomia” along with the state of “chrematistic.”

2.1 Unfinished Business

In his most recent public address in May 1999, economist John Kenneth Galbraith noted that one of the most important “unfinished business” issues for economics as we approach the new millennium include: the shortcomings of GNP/GDP as an economic measure; economic instability (cycles of boom and bust), and; poverty and income inequality. Galbraith noted that “there is a major flaw in measuring the quality and achievement of life by the total of economic production – (GNP/GDP) – the total of everything we produce and everything we do for money.” Galbraith continues to echo the words of Simon Kuznets by noting that measures such as GNP override and obscure deeper and more important aspects of economic life, failing to “take sufficient account of the value and enjoyment of what is produced.”

Simon Kuznets, one of the earlier pioneers of national income accounting for the US in the 1950s remarked “The welfare of a nation can scarcely be inferred from a measurement of national income as defined (by the GDP) ….Goals for more growth should specify of what and for what.” Robert Kennedy once remarked that “It (GNP or GDP) measures everything, in short, except that which makes life worthwhile.”

Kuznets went so far as to recommend the eventual construction of a single bottom line for national well-being as if foreshadowing the eventual attempts beginning with Tobin and Nordhaus (1971) and advancing with the Index for Sustainable Economic Welfare (1989) and the Genuine Progress Indicator (1994). Kuznets (1965) noted:

“It does seem to me, however, that as customary national income estimates and analysis are extended, and as their coverage includes more and more countries that differ markedly in their industrial structure and form of social organization, investigators interested in quantitative comparisons will have to take greater cognizance of the aspects of economic and social life that do not now enter national income measurement; and that national income concepts will have to be either modified or partly abandoned, in favour of more inclusive measures, less dependent on the appraisals of the market system... The eventual solution would obviously lie in devising a single yardstick that could then be applied to both types of economies – a yardstick that would perhaps lie outside the different economic and social institutions and be grounded in experimental science (of nutrition, warmth, health, shelter, etc.)”

Herman Daly, Professor at the University of Maryland School of Public Affairs, former senior economist at the World Bank, and co-founder of the International Society for Ecological Economics (ISEES) has been one of the most important voices for raising awareness of the shortcomings of modern economics and redefining our notion of economic progress and measurement of sustainable well-being. Daly (1996; 111-112) notes “economic development as it is currently understood and measured is neither sustainable for a
long future nor generalizable to all presently living people….the macroeconomic activity of national economic growth does not conceive of as having an optimum extent…GNP is a conflation of costs, benefits and changes in accumulation, and is no better a guide to determine the optimum level of economic activity than the stock of gold bullion.” Daly (1996; 113) suggests that instead of one income account, the GNP/GDP, nations adopt: 1) a benefit account (measures the value of services yielded by all accumulations); 2) a cost account (measure the value of depletion, pollution and those kinds of labour that are irksome), and; 3) capital accounts (inventory of the accumulation of stocks and funds (produced and natural capital, and ecosystem infrastructure) and their ownership distribution.

2.2 More Growth of What and for Whom?

One of the fundamental challenges in achieving and measuring a sustainable economy is asking the question “more growth of what and for whom?” and “growth?: at what price to the community, quality of life and the environment?.” Conventional economic thinking and measures of economic progress, such as the GDP (Gross Domestic Product) were designed over 50 years ago to measure the overall income, production and consumption of national economies. Simon Kuznets, the U.S. economist and one of the chief architects of the system of national income accounts (and the GDP) following WWII, wrote “the welfare of a nation can scarcely be inferred from a measurement of national income as defined by the GDP.” What started as a measure of productivity of nations, the GDP is now commonly and misleadingly interpreted as a measure of economic health and welfare.

2.3 Shortcomings of GDP

Current economic measures of economic progress (such as the GDP) fail to measure the overall well-being of households and the state of health or sustainability of the environment. The GDP is simply the sum total of all monetary transactions in an economy – the more we spend, consume and produce the more the GDP rises. The GDP makes no distinction between healthy versus regrettable economic activities.

Major deficiencies of the GDP as an economic measure include that it:

• does not track reductions in levels of a country’s stock of natural resources;
• does not account for degradation of the health or integrity of the ecosystem and treats pollution and destruction as economic gain rather a cost or liability to current and future generations;
• does not distinguish between economic activity that improves human welfare from those activities that arise from a reduction in human welfare (for example, cancer treatment that resulted from pollution-induced cancers); and
• does not include changes in value-added transactions, which improve human welfare but occur in the “informal” and unpaid voluntary and household economy, as well as the subsistence economy.
2.4 Alternative Measures of Well-Being and Sustainable Development

The Brundtland Commission coined “sustainable development” in 1987 as “development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs.” Considerable energy and debate has ensued as to how to measure sustainable development that strikes a balance between achieving economic growth while preserving the integrity of environmental, human and social capital.

2.4.1 Indices of Sustainability and Well-Being

According to Redefining Progress (San Francisco) there are now well over 300 initiatives in North America involving indicators of quality of life, economic well-being, sustainable development, and government performance at the national, regional and community level. While there are many common features, no one measurement framework is alike nor is any one more valuable than another. In terms of measuring economic well-being and sustainability beyond traditional measures such as the GDP, a number of measurement frameworks have emerged over the past 30 years including:

- the **Measure of Economic Welfare** (MEW) developed in 1972 by William Nordhaus and James Tobin and estimated for Canada by Statistics Canada;
- the **Index of Sustainable Economic Welfare** (ISEW), developed in 1989 by Clifford Cobb which first appeared in “For the Common Good” by Herman Daly and John Cobb Jr. which has been estimated for British Columbia, most European nations, South Korea and Chile. The ISEW is the predates the GPI.
- the **Genuine Progress Indicator** (GPI), developed in 1995 by Redefining Progress for the U.S. and estimated for Canada by Statistics Canada and for Australia;
- the **Index of Economic Well-Being** (IEWB) developed by the Centre for the Study of Living Standards;
- the **Index of Social Health** (ISH) developed at Fordham University and estimated for Canada and its provinces by Human Resources Development Canada; and
- the **Index of Living Standards** (ILS) produced by the Fraser Institute.
- the **Human Development Index** (HDI) developed by the United Nations Development Program;
- the **Quality of Life Index** (QOL) developed by Ed Diener of the University of Illinois;
- the **Index of Social Progress** (ISP) developed by Richard Estes of the University of Pennsylvania, and;
- the **Edmonton Social Health Index** (ESHI) developed in 1998 by Mark Anielski for the Edmonton Social Planning Council.

While each approach has its own respective strengths, we observe that 1) there is no consensus on a single model for measuring sustainability and quality of life and 2) there is no unifying principle or model that would combine measures of economic well-being (usually expressed in monetary terms) and quality of life indicators (measured in non-monetary terms).

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2 The GPI is an expansion of the original Index of Sustainable Economic Welfare (ISEW) conceived and developed by John B. Cobb, Jr., Clifford Cobb and Herman Daly (see *For the Common Good* by Daly and Cobb, 1989, 1994). The GPI embodies these earlier pioneering efforts. The GPI has been replicated in Australia (Hamilton and Saddler, 1997) and Canada (Messinger and Tarasofsky, 1997 and Colman, 1998, in the case of the Atlantic Canada GPI). The ISEW has been developed for United Kingdom, Germany, Austria, Sweden, Netherlands, Italy, Australia, Chile, and Korea (Jackson and Marks, 1994; Diefenbacher, 1994; Hochreiter et al., 1995 and Stockhammer et.al. 1997; Jackson and Stymne, 1996 and Tammo and Roseburg, 199X; Guenno and Tiezzi, 1996; Hamilton and Saddler, 1997; Castenada, 1997, and Won and Jeong, 1997).
The Alberta GPI Accounts hope to be broad enough to provide the information required to derive many of
the indicators and indices currently in vogue, whether that is the UN’s HDI, the GPI, the ISH or other
indices that emerge in coming years.

2.4.2 Natural Resource and Environmental Accounts

Natural resource and environmental accounting has emerged as a meaningful approach to accounting for
the physical and monetary dimensions of natural capital sustainability. Several countries, including
Canada, Norway, France, Japan, the Netherlands, China, Chile, Indonesia and Costa Rica have attempted
to construct such accounts. The first resource accounts for Canada were developed for Alberta for forests
(timber) and carbon (Anielski (1991, 1995, 1997), oil and gas (Smith, 1992, Anielski, 1996) and
agricultural soils (Lerohl, 1992). These accounts consider the physical stocks and flows of natural
resources, including environmental quality, and their monetary value. Such accounts provide a useful
framework to expanding into areas of human and social capital accounting.

Most recently, a panel of economists and experts through the US National Research Council issued their
recommendations in Nature’s Numbers (1999) for expanding national income accounts (GDP) to include
natural capital and environmental accounts:

“The panel concludes that developing a set of comprehensive nonmarket economic accounts is a
high priority for the nation. Developing nonmarket accounts to address such concerns as
environmental impacts, the value of nonmarket natural resources, the value of nonmarket work,
the value of investments in human capital, and the uses of people’s time would illuminate a wide
variety of issues concerning the economic state of the nation….the panel concludes that the
development of environmental and natural-resource accounts (and nonmarket accounts) is an
essential investment for the nation.” (Nature’s Numbers, p. 3, 9).

Expressing these quantitative and qualitative accounts in monetary terms (market values) is also an
important tool for natural resource and environmental accounting allowing for potential reconciliation
with national income accounts from which the GDP and other economic indicators of consumption and
production are derived. The natural resource accounting architecture of both physical (quantitative and
qualitative) accounts and monetary accounts are useful tools for assessing progress towards sustainability
as originally defined by the Brundtland Commission. Such accounts provide answers to questions such as:
how much timber do Albertans have left to meet current needs for self-sufficiency and the needs of our
grandchildren? How many years of oil and gas production do we have left? What is the state of our
agricultural lands in terms of soil productivity to produce crops or livestock on a sustainable basis for the
next 20 years? Are we living off nature’s income or drawing down nature’s capital base at a rate that will
compromise a sustainable stream of benefits for human consumption and for ecological integrity? These
are the pragmatic questions to understanding sustainability and well-being, at least from the perspective
of natural wealth. Understanding the state of our natural resource wealth in both physical and monetary
(market value) terms is important to sustainable stewardship for current and future generations.

The natural resource accounts are a useful starting point for extending the accounting of sustainability and
well-being into areas of human, social, financial, and produced (manufactured) capital or wealth. The
construction of such accounts is challenging, though construction of quantitative-qualitative accounts and
full cost-benefit (monetary value) accounts for total wealth or capital is feasible given data availability. It
is conceivable, for example, to construct time-use accounts that would reveal how we invest our time
(life’s energy) to paid work, parenting, leisure, eldercare or volunteerism. Another example, is the
construction of Ecological Footprint accounts that show how our household consumption patterns have
changed over time with respect to how much land and resources our required to meet our demands for
shelter, food, clothing, and transportation. Are we better off or worse off in 2000 compared to 1960 in
terms of leisure time or our ecological footprint? These are important and relevant issues for defining well-being and sustainability of current and future generations. Applying cost or benefit monetary valuation to the quantitative-qualitative accounts would allow decision makers to understand the full economic benefits and costs associated with today’s consumption and production activities so as to provide a more completed picture of economic well-being beyond the traditional GDP metric, that only accounts for the monetary value of transactions (consumption and production) in our economy.

2.4.3. Social Indicators of Quality of Life

Social indicators are typically non-monetary in nature and are generally not comparable given different units of measurement of used. Nevertheless many attempts have been made to standardize or normalize indicators and allow for their aggregation, such as is the case with the UN Human Development Index (HDI) and the Index for Social Health (ISH) (Miringof; Zeesman and Brink). Similar normalization of indicators has been accomplished in the case of Pearce County (Washington state) Quality of Life Indicators. Anielski (1998) applied some of these techniques in the development of the Edmonton Social Health Index for the Edmonton Social Planning Council – the ESHI is a composite index of 15 indicators of health and socioeconomic well-being.

The strength of such methods for standardizing otherwise incomparable indicator data sets, is that they allow for aggregation in the absence of a common unit of measurement like a dollar. Normalizing a data set in order to make one indicator comparable to another involves converting the raw data into a numerical index equivalent, similar to the construction of the Consumer Price Index. For example, a benchmark number is set to 100 basis points against which all other time series figures are compared. There are many challenges including the choice of a benchmark year, which should be consistent across all indicators. Other challenges lie in the decision on whether or not to weight indicators and on what basis.

Notwithstanding these challenges, this approach to comparing indicators that are non-monetary in nature lend themselves to the objective of measuring aspects of social-human sustainability or well-being.

2.4.4 The US GPI Model

While many different models for measuring quality of life and sustainable development have been developed, we feel that the US Genuine Progress Indicator (GPI)\(^3\) (and its predecessor, the Index for Sustainable Economic Welfare (ISEW)) provide the best model for measuring well-being and sustainability.

The GPI-ISEW is intended as a more complete measure of economic, social and environmental well-being. The GPI-ISEW is a kind of “balanced scorecard” for the nation that takes as its starting point the broadest measure of economic progress -- the gross domestic product or GDP – and adjusts for the full benefits and costs related to environmental, social and human capital that are currently ignored in the GDP figures or where the consumption of these forms of capital is treated as income rather than as a regrettable cost or depreciation cost. The GPI, by contrast, begins with personal consumption expenditures (which makes up 65% of US GDP), then makes 24 adjustments (both positive and negative) for the following values:

- adjust for income inequality (that imposes a “cost” on social cohesion)
- add the value of unpaid labour (housework, parenting, and volunteerism)
- add the value of public and household infrastructure (streets and highways, consumer durables)

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3 The GPI was developed by Cobb, Halstead and Rowe for Redefining Progress (San Francisco) in 1995, and updated for 1997 by Anielski and Rowe (1999) and again for 1998 Cobb and Wackernagel for 1998.
• add the value of investments in education and health care
• subtract social welfare costs (crime, family breakdown, commuting, underemployment)
• subtract the value of lost leisure time
• subtract the cost of environmental degradation and pollution (air, water, ozone, climate change, long-term environmental damage)
• subtract the cost of unsustainable resource use (forests, wetlands, farmland)
• subtract the cost of depletion of nonrenewable resources (oil, gas, coal and minerals)
• add or subtract for net capital growth and international investment position (foreign borrowing or lending)

The result is a GPI “sustainable income bottom line” expressed in dollars that can be compared to the GDP over time for a nation, state or province.

The GPI and the ISEW have been replicated for several nations, including a preliminary estimate for Canada by Hans Messinger with Statistics Canada. The strength of the GPI framework is its open and transparent system of accounting for the physical and economic (monetary) dimensions of human, social, environmental and economic (produced, financial) capital or wealth. At the same time, it allows for the development of a single “bottom line” expressed in monetary terms, adding up the full costs and benefits associated with sustainable living. There is considerable room for improving the original GPI framework by considering the relevance of adopting traditional accounting conventions for financial statements that would include physical inventories, balance sheet (assets, liabilities, equity), income statements (revenues and costs) and performance indicators that are derived from the GPI accounts.

2.4.5. Engaging Citizens in Defining Well-being and Quality of Life

Many indicators and public policy performance measurement initiatives fail because top-down processes did not engage or fully consult citizens early on and throughout the measurement process as to their values and issues. A critical step, that should probably precede the development of indicators of sustainable progress, well-being and quality of life for a community, should be a process of engaging and assessing the opinions, values, principles and vision of the “good life” held by citizens in that community. An understanding of the values and objectives citizens hold for sustainability of social, economic and environmental well-being is required for indicators to have any utility to the communities they ultimately serve. Values can be solicited through direct consultation, focus groups and public forums or through opinion surveys. The indicators that are developed could be tied to the values and issues expressed by citizens.

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4 Included in the original ISEW but excluded in the US GPI.
3. An Alberta Blueprint for Measuring Genuine Progress

The Alberta GPI will build upon the original US GPI architecture but extend this model to a more traditional accounting system allowing for the measurement of sustainability of total wealth or capital of a society, bringing together both economic and non-monetary (physical, qualitative) dimensions.

The Alberta GPI initiative would run parallel to the work by Ron Colman of GPI Atlantic in the development of 20 GPI indicators for Nova Scotia. The Alberta GPI project hopes to work in partnership with Colman’s initiative given the importance of their work for advancing GPI accounting methodologies.

Data will be sourced from both provincial and federal governments, along with other third-party sources, as required. Provincial data from indicators and inventory from the Government of Alberta’s Measuring Up and ministerial performance reports (annual reports) will be used along with statistics from Statistics Canada. Every attempt will be made to construct a time series for each of the components of the Alberta GPI dating back to 1960 as the benchmark year. Where data is not available, extrapolation of data points may be necessary, as in the case of the US GPI work.

The Alberta GPI will be distinct amongst past and present GPI/ISEW studies in that we adopt a more conventional accounting framework (ledger, balance sheets and income statements) to account for the sustainability of natural, human, social, produced (manufactured) capital. This will entail the construction of a series of accounts that would show the total physical state and value of natural, human and social wealth as well as the produced and financial capital of a region or nation. The proposed Alberta GPI accounts are similar to the balance sheet and income statement used by accountants to assess the financial well-being of an firm or organization. The “Alberta Balance Sheet” would show the physical and monetary state of our assets, liabilities, and owner’s equity (distribution of wealth). The “Alberta Income Statement” would show the flow of all benefits (revenues) and costs associated with total wealth—human, social, natural, manufactured (built) and financial capital. Both balance sheet and income statements would be expressed in both physical terms (inventory stocks and flows) and monetary terms, allowing decision makers to understand well-being and sustainability in both physical and economic (monetary) terms. The GPI accounts would serve as a “guidance system” by providing a “30,000 foot” perspective on the qualitative and monetary state of the total wealth of the province, to empower better stewardship.

The GPI Accounts should be viewed as an ongoing iterative initiative; like continuous home improvements to an existing structure. The GPI Accounts have an open architecture that allows for adjustments and improvement over time as the values and priorities of citizens and governments change and as more information becomes available to improve the structure.
3.1 Analysis of Values

The first step in the development of the Alberta GPI will be an analysis of the values of Albertans. Indicators of the well-being of the households and environment of Alberta must be relevant and aligned with the values held by Albertans. The Alberta GPI project will include an assessment of changes in values over time – that is what do Albertans consider most important in defining their quality of life and well-being at an individual and household level. What are the issues that make life worthwhile? Opinion polls from various surveys will be assessed, including historical opinion surveys from the University of Alberta’s Population Research Lab as well as publicly available opinion poll results collected by government and pollsters. The values most important to Alberta households might be used to weight or rank components of the GPI Accounts (including monetary and non-monetary indicators of sustainability and well-being). For example, the opinion poll conducted for the 1997 Alberta Growth Summit found that 22% of Albertans considered “nature” as their most important issue or value. This importance could be used to ascribe a weighting on indicators of ecological health (integrity) or used as a basis for reporting on “state” of the most important values to Albertans. While weighting of indicators in notoriously difficult and controversial, this approach may be attractive from a pragmatic perspective and would resonate with citizens.

The GPI Accounts and indicators, that show the current “state of Alberta” and trends over time, might be used to solicit feedback from citizens as to how the evidence makes them “feel” about their well-being. For example, the crime rate indicators might be decreasing, however people may feel more vulnerable about their personal safety.

3.2 Genuine Progress Indicator (GPI) Accounts

Economist Herman Daly (1996) has advocated the adoption of three accounts that could replace the current national income accounts (GNP/GDP) namely: benefit, cost and capital accounts. Our proposed Alberta GPI Accounts is consistent with Daly’s three accounts whereby full benefits and costs would be accounted for in an “income statement” and total wealth or capital in a “balance sheet”—both statements expressed in physical (stock and flow) and monetary value terms. The physical inventory “balance sheets” would reveal the physical and qualitative “stock” and flow of human, social, and natural wealth as well as produced (manufactured) and financial capital. This “inventory” of total wealth and capital would be similar to an oil company maintaining a running inventory of its oil or gas reserves.

The Alberta GPI Accounts would be constructed along three main themes of sustainability: economy, environment and society. The accounts would attempt to extend over time from 1960 to 2000. Figure 2 illustrates the architectural layout of the accounts. Table 1 identifies several sub-accounts, which the Alberta GPI project hopes to develop. The Alberta GPI Accounts would yield: 1) a physical inventory of
stocks and flows (or quantitative/qualitative proxies); 2) monetary accounts (full benefits and costs of both stocks and flows, and; 3) indicators of sustainability or quality of life. Using the language of accounting, a “Alberta GPI balance sheet” and “GPI income statement” will be developed, expressing total wealth or capital in both physical (qualitative) and monetary terms. Thus the accounts are intended to serve two purposes: 1) provide a physical/qualitative account of sustainability and quality of life of Alberta households and; 2) provide a monetary (full cost and benefit) account of total wealth or capital of the province.

These accounts are preliminary in nature and for some readers will reveal gaps or missing accounts. We welcome your input and comments. The GPI Alberta Accounts are meant to solicit input to ensure continuous improvement over time.

**Figure 2**

Genuine Progress Indicators (GPI) Accounts

These three integrated sets of well-being accounts would provide important qualitative and monetary-economic information to citizens and decision-makers on some of the most important questions about quality of life, well-being, and sustainable development such as:

- What defines a sustainable society, economy and ecosystem?
- What is the productive state of our social, ecological, and financial capital?
- What should “the good life” and the “good society” be defined?
- How resilient, sustainable and healthy is the economy, society, and environment?
- How vulnerable is the well-being of businesses and households to conditions of social capital erosion and natural capital depletion and degradation?
- How healthy are our communities, households, and businesses?
- How healthy are we in our lifestyles? How much leisure do we have?
- How sustainable is our stewardship of natural resources?
- Are we living within nature’s carrying capacity? What is our ‘ecological footprint’?
- What is the health and quality of air, water, and land?
Table 1 provides a detailed breakdown of the various components or sub-accounts for the proposed Alberta GPI Accounts. The GPI Accounts would extend from the year 1960 through to 2000, given the constraints of data availability and comparability over time. To many this list may seem incomplete and may reveal our own selection bias. We have attempted to be as comprehensive as possible by considering the original GPI as a starting point, incorporating indicators from the Alberta Government (*Measuring Up* and ministry performance measures), as well as indicators used by other jurisdictions in North America for measuring quality of life and sustainability. The framework is meant to stimulate debate amongst Albertans as to what should be “in” or “out” of a total well-being accounting system. Remember, that the GPI Accounts should ultimately align with the values most important to the households of Alberta.

**Table 1  Genuine Progress Indicators Accounts (1960-2000)**

**Economic Sustainability Indicator Accounts**

The Economic Sustainability Indicators Accounts would account for the overall health of economy, as measured by the GDP (and its components, including trade), income and equity, infrastructure, and transportation. The account would be split into two components: 1) a monetary (economic value) account, and; 2) a non-monetary indicator account. Both sets of monetary and non-monetary accounts would be constructed on the basis of a “balance sheet” (stocks) and “income statement” (flows) of human-social capital.

**Economy**

1. GDP (gross domestic product)
   - Personal Consumer Expenditures
   - Government Expenditures
   - Government Investment in Fixed Capital
   - Business Investment in Fixed Capital
   - Business Investment in Inventories
   - Exports less Imports of Goods and Services

2. Expenditures by type and by households, business and government (indexed)

**Financial**

3. Debt and net foreign lending/borrowing (government, household and business (indexed))
4. Savings (government, household)

**Livelihood: employment and income equity**

5. Employment, unemployment and underemployment (see also *Time Use Accounts*)
6. Income, living wage, and poverty (people living below living wage)

**Equity**

7. Equity: income and wealth inequality (inter- and intra-generational)

**Infrastructure**

8. Household durables (infrastructure)
9. Public infrastructure

**Transportation and Trade**

10. Commuting and public transit
11. Commercial transport and trade

**Economic Sustainability Index**
Societal Sustainability Indicator Accounts

The Societal Sustainability Indicator Accounts would account for the overall health of people and communities. Such an account would be constructed as per Figure 3. This account would be further split into two components: 1) an economic value account (monetary), and; 2) a well-being indicators (non-monetary) account. The economic value account would consider the total costs and benefits associated with each well-being indicator that could be used to reconcile with existing GDP (gross domestic product) and national/regional income accounts.

Time Use
12. Paid work
13. Unpaid work-time
14. Unpaid housework, parenting and eldercare
15. Volunteerism
16. Leisure time
17. Commuting time
18. Employment, involuntary unemployment, underemployment, and overtime

Social Capital
19. Crime and violence
20. Family breakdown
21. Voter participation
22. Democracy (days in legislature and use of closure on debate)

Knowledge Capital
23. Educational attainment

Health and Wellness
24. Life expectancy and quality of living
25. Unhealthy lifestyles
26. Premature mortality
27. Disease
28. Auto accidents
29. Infant mortality and lowbirth weight
30. Teen pregnancy
31. Suicide
32. Aboriginal well-being
33. Substance abuse (drugs, alcohol)
34. Gambling

Social Sustainability Index

Environmental Sustainability Indicator Accounts

The Environmental Sustainability Indicator Account would account for the health and sustainability of natural resources (renewable and nonrenewable resource capital), environmental quality, and ecological systems health. The account would be constructed as per Figure 4. Again, the account would be split into two components: 1) a monetary (economic value) account, and; 2) a non-monetary indicator account. Both sets of monetary and non-monetary accounts would be constructed on the basis of a “balance sheet” (stock) and “income statement” (flow) of human-social capital.

35. Ecological footprint (food, energy, clothing) and industrial footprint (eco-efficiency)

Natural Resource Accounts
36. Nonrenewable energy resources (oil, gas, gas-byproduct) – reserve life
37. Subsoil resources (minerals)
38. Forests (timber and non-timber resources)
39. Wetland
40. Peatland
Environmental Quality Accounts

46. Air quality and greenhouse gas emissions
47. Carbon footprint (deficit/surplus)
48. Water (surface and ground) quality and flow
49. Noise pollution
50. Ozone depletion
51. Toxic waste (production and releases)
52. Solid waste (landfill)

Environmental Sustainability Index

= GPI Index  (a composite of accounts)

3.3 GPI Balance Sheet (Physical and Monetary Stock Accounts)

3.3.1 Physical Balance Sheet
The “GPI balance sheet” (see Table 2) would be constructed as per conventional accounting standards according to assets, liabilities and net worth (equity or distribution of wealth). The GPI “balance sheet” would include a physical (quantitative or qualitative) stock or asset account of the balance of total wealth (natural, human, social) and capital (produced and financial) over time showing additions and depletions of the stock of wealth or capital. The GPI balance sheet would provide a broader perspective of the wealth of nations based on an account of the physical and monetary value of the stock and flow of human, social, natural, manufactured (built) and financial capital. Just as organizations keep track of their assets, depreciation of assets, liabilities and owners equity (net worth, distribution of financial wealth), so too can nations. The accounts would also yield information for developing indicators of sustainability, just as financial statement yield indicators of financial performance (e.g., return on investment (ROI)). An example for natural capital would be a timber sustainability index – the ratio of timber (capital) growth relative to depletions (harvest, industrial development, fire, and insects).

The construction of the GPI balance sheets would follow the structure of natural capital accounting advocated by the US National Research Council (“Nature’s Numbers: Expanding the National Accounts to Include the Environment”, 1999), the United Nations Statistical Office, and Statistics Canada (Econnections). For example, a nonrenewable resource account for oil, gas, and coal energy capital would reveal the current stock or reserves of economically accessible oil and gas as well as the additions (new discoveries or changes in market conditions) and depletions from extraction. These accounts would reveal, for example, the reserve life—the ratio of reserves to current production—as an indicator of how much oil or gas remains.

Developing such accounts for human and social capital is more problematic from an accounting perspective. Proxies for human and social capital will be considered. For example, time use accounts could be constructed that show the total stock of “life-time energy” (i.e., time) embodied potentially available by the people of Alberta and how people invest this time in paid work, volunteerism, parenting, leisure, and elder care. These figures could be derived from life expectancy, premature mortality, infant mortality and other indicators of “life energy.” Stock accounts for produced (manufactured) capital could also be developed that would include the physical stock (and flow) of public and private infrastructure (buildings, homes, automobiles and other stuff). Financial capital (debt, savings) could simply be expressed in monetary terms.
### Table 2  Alberta GPI Balance Sheet (1960-2000)
(physical and monetary stock accounts)

<table>
<thead>
<tr>
<th>Assets</th>
<th>Liabilities</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Natural Capital</strong></td>
<td><strong>Environmental</strong></td>
</tr>
<tr>
<td>Renewable resources</td>
<td>Ecological Footprint</td>
</tr>
<tr>
<td>- Forests</td>
<td>Industrial Footprint</td>
</tr>
<tr>
<td>- Agriculture</td>
<td>Toxic waste stocks</td>
</tr>
<tr>
<td>- Wildlife and fisheries</td>
<td></td>
</tr>
<tr>
<td>- Water</td>
<td></td>
</tr>
<tr>
<td>- Air</td>
<td></td>
</tr>
<tr>
<td>Nonrenewable resources</td>
<td><strong>Human-Social</strong></td>
</tr>
<tr>
<td>- Oil and gas</td>
<td>Equity and inequality (income, poverty)</td>
</tr>
<tr>
<td>- Minerals</td>
<td></td>
</tr>
<tr>
<td>Ecosystem functions</td>
<td><strong>Produced Capital</strong></td>
</tr>
<tr>
<td>- Carrying capacity</td>
<td>Infrastructure liabilities</td>
</tr>
<tr>
<td>- Carbon sequestration</td>
<td></td>
</tr>
<tr>
<td><strong>Human Capital</strong></td>
<td><strong>Financial</strong></td>
</tr>
<tr>
<td>Time (life-time)</td>
<td>Debt</td>
</tr>
<tr>
<td>Health</td>
<td></td>
</tr>
<tr>
<td>Knowledge (education)</td>
<td><strong>Net Worth (equity)</strong></td>
</tr>
<tr>
<td>Hope and joy (job satisfaction, quality of life)</td>
<td>Distribution of wealth (assets)</td>
</tr>
<tr>
<td>Compass</td>
<td></td>
</tr>
<tr>
<td><strong>Social Capital</strong></td>
<td></td>
</tr>
<tr>
<td>Social institutions</td>
<td></td>
</tr>
<tr>
<td>Political processes</td>
<td></td>
</tr>
<tr>
<td><strong>Produced Capital</strong></td>
<td></td>
</tr>
<tr>
<td>Real estate</td>
<td></td>
</tr>
<tr>
<td>Consumer durables</td>
<td></td>
</tr>
<tr>
<td>Plant and equipment</td>
<td></td>
</tr>
<tr>
<td>Infrastructure (public and private)</td>
<td></td>
</tr>
<tr>
<td><strong>Financial Capital</strong></td>
<td></td>
</tr>
<tr>
<td>Savings</td>
<td></td>
</tr>
</tbody>
</table>

#### 3.3.2 Monetary GPI Balance Sheet
Sustainability can be measured in both physical and monetary terms. Much of our economy is defined in terms of money (chrematistics) or exchange values as a proxy for real wealth that is being consumed, traded or converted into produced capital. Ideally, sustainability should be measured in terms of both physical (quantitative and qualitative) and monetary terms in order to ensure complete accounting of well-being since many aspects of well-being (e.g., ecological integrity or value of longevity) lie outside of a market place where exchange value is revealed.
The monetary “GPI Balance Sheet” would be developed by assigning the full costs and benefits to the stock and flow parameters of the physical (quantitative and qualitative) accounts. Various alternative valuation methods could be used including current market values for good/services, economic rents (market price less production costs) for public resources, actual government/household/business expenditures, and estimated risk premiums (monetary) associated with liabilities related to well-being and sustainability. Each GPI Account parameter would have a physical and monetary expression. The GPI monetary accounts would reveal the full benefit-cost associated with the consumption (and production) of natural, human, social, produced and financial wealth, expressing sustainability and well-being in monetary terms (that is exchange value, as opposed to “use-value”).

The complete GPI Balance Sheet, that contains both physical and monetary values for respective wealth and capital categories. Such a Balance Sheet would reveal the current physical, qualitative and monetary state of “wealth” of Alberta or the nation. The GPI Balance Sheet would provide a complete account of the physical stock and/or qualitative state of the total wealth of the province in accordance with the values held by society, as well as their monetary or market value (costs). This would differ from the current national income accounts and GDP figures, which measure primarily the monetary value of all goods and services bought and sold in the economy. In a sense it provides an account of the health of the “foundation” of “Alberta household.” The GPI Balance Sheet would provide us a mirror on the current state of human, social, natural, produced and financial capital, expressed in terms of physical volume and monetary (market) value. Historical balance sheets would allow us to assess change in the true wealth of the province or nation. Are we better or worse off in the year 2000 than we were in 1960 or 1900?

What is immediately apparent from the GPI Balance Sheet prototype is the many challenges for both inventory and monetary valuation of assets, liabilities and net worth. Some categories can be readily derived from existing information, for example produced and financial capital. Others, such as human, social and some forms of natural capital assets will present significant challenges. Also challenging will be the “liabilities” associated with the erosion of social or human capital, the depletion of natural resources, such as oil, gas, coal or forests, and the “costs” of climate change due in part to petroleum production and use. How should these liabilities be measured in physical, qualitative or monetary terms? Yet, estimating liabilities is important for understanding intergenerational equity issues. Are we incurring environmental and social liabilities whose burden will be felt by our children or grandchildren?

Perhaps the most controversial is the measurement of “net worth”, equity or the distribution of wealth in the GPI Balance Sheet. How evenly is wealth and ownership of assets distributed? Who has title or rights to Alberta’s natural resource capital? Just as incorporation documents reveal the directors and distribution of shares in a company, the Alberta GPI account would reveal the distribution of ownership of wealth by Albertans. The distribution of wealth and ownership is critical to understanding the balance of power in the province. Inequality of wealth, income and power can have important impacts on social cohesion and a sense of community.
3.4. GPI Income Statement (Physical and Monetary Flow Accounts)

The “GPI Income Statement” would consist of a physical flow account and a monetary (full benefit and cost) account. The proposed Alberta GPI Income Statement (see Table 3) would complement the GPI Balance Sheet providing information on the annual flows (physical use, additions, qualitative changes) and their monetary (market) value associated with all forms of wealth in an economy and natural environment. The benefit account would measure the value of all goods and services transacted in an economy that are derived or realized from the accumulation of all forms of capital (as Herman Daly notes, “not just those rented during the accounting period, but also those used in production that is enjoyable and self-fulfilling”).” The cost account would measure the value of depreciation of produced, social, human, environmental and social capital, specifically the cost of depletion, pollution and “disutility of those kinds of labor that are irksome” (Daly, 1996). As Daly notes, with both a benefit and cost account we could occasionally ask whether the extra benefits or costs of further accumulation of capital or the depletion of capital to fuel growth were worth the extra costs.

Table 3 Alberta GPI Income Statement, 1960-2000 ($ millions)

Revenues (Benefits)

- GDP - Gross Domestic Product (expenditure-based\(^5\), at market prices):
  - Personal Consumer Expenditures
  - Government Expenditures
    - Intermediate Expenditures/Investment in Human Social and Environmental Capital
  - Government Investment in Fixed Capital
  - Business Investment in Fixed Capital
  - Business Investment in Inventories
  - Exports less Imports of Goods and Services

Unaccounted Benefits

- Value of Unpaid Work
  - Volunteerism
  - Parenting and Eldercare
  - Subsistence Living
- Value of Services from Public Infrastructure
- Value of Services from Consumer, Household, and Business Durables
- Value of Ecosystem Services
  - Forests
  - Peat lands
  - Wetlands
  - Carbon Sequestration

Costs/Expenditures

- Expenditures (regrettable)
  - Cost of crime (expenditures)
  - Cost of substance abuse (Drugs, Alcohol)
  - Cost of unhealthy lifestyles
  - Cost of gambling
  - Cost of family violence and breakdown
  - Cost of auto accidents (expenditures)
  - Public and private environmental clean-up costs
  - Cost of toxic waste management
  - Cost of household waste management
  - Personal (household) and business pollution control costs

\(^5\) May also consider a Sustainable Income Account on an income-based GDP basis to highlight the breakdown of sources of income contributing to Yukon GDP.
Depreciation/degradation costs

- ‘Cost’ of income inequality (GINI coefficient)
- Depreciation cost of public infrastructure
- Depreciation cost of consumer, household, and business durables
- Value of loss of leisure time
- Depreciation cost of nonrenewable resource use
- Cost of long-term environmental damage from fossil fuel use
- Cost of unsustainable forest resource use
- Cost of loss of farmland
- Cost of loss of wetlands
- Cost of loss of wildlife and fisheries
- Cost of ecosystem service losses
- Cost of air pollution
- Cost of water pollution
- Cost of noise pollution
- Cost of ozone depletion
- Change in net financial position (external debt)

= GPI Net Sustainable Income

Just as firms or organizations keep track of their revenues and expenditures, so should nations track the flow of benefits and costs associated with the households of the nation or region. Organizations account for their revenues and costs to provide managers and creditors with relevant information to assess the financial well-being of the organization. The income statement is critical to effective management of cash flow and to determining the taxable net income upon which taxes are levied by government.

The GPI Income Statement would be distinguished from traditional income statements in that it would provide total benefit and cost account associated with the consumption and production of wealth or “living capital” as well as the well-being of households. The bottom line derived from a GPI Income Statement is essentially the “net sustainable income” bottom line; this is the basis of the original US GPI accounting framework.

The GPI net sustainable income starts with the GDP. GDP is like the gross revenues in a firm’s income statement (before expenses and depreciation costs). The GDP is the sum total of the monetary value of expenditures or income by households, government and businesses. The GDP is “gross” in the same way “revenues” (before expenses) are gross for any organization. The GDP does not net out depreciation costs on human, social, or natural capital, nor does it distinguish between expenditures or income that might be deemed regrettable or undesirable for genuine well-being.

Unaccounted benefits (e.g., value of volunteerism) are added to the GDP while depreciation costs and regrettable costs (expenditures) associated with human, social, natural wealth and produced and financial capital are deducted. There are some value or benefits, which the GDP ignores. These include 1) the value of unpaid work (the value of time spent at housework, parenting, elder care and volunteerism), 2) the value of benefits from public infrastructure, 3) the value of ecosystem services and 4) the value of services from household, business and government durables and infrastructure (e.g., appliances, homes, structures). These would have to be included or added to GDP to provide a more comprehensive picture of the stream of benefits related to well-being.

The unaccounted full costs (some regrettable expenditures) and depreciation costs on capital would be deducted in the GPI Income Statement. Organizations track costs largely to manage cash flow and to reduce taxable income netting these out of income. However, there is much a society does not track in terms of costs. For example, we do not estimate the total or full cost of crime or the full cost of fossil fuel production. A society is also interested in tracking the actual costs or expenditures made by households,
government or business but mostly for assessing the magnitude and trends in these costs. More important to a community or society is assessing well-being from the perspective of whether human, social, and environmental well-being is being degraded or eroded over time. That is, what is the “depreciation cost” of depleting natural resources, environmental quality along with social and human capital? Are there expenditures made by households, governments and business that we might deem “regrettable”, “unsustainable” or “undesirable?”

The “GPI net sustainable income” bottom line tells us whether we are running an annual “surplus” or “deficit” in genuine progress; whether we are living sustainability off the interest of total capital or eroding the capital stock. The GPI net sustainable income line can be compared with Alberta’s GDP figures to show, as with the US GPI, the gap between economic throughput and genuine, sustainable well-being.

The key challenge in the GPI Income Statement, as with GPI accounting in general, is the debate over whether a value being accounted for is a regrettable “cost” or true “depreciation” of wealth, capital, or well-being. For example, some people might view commuting to work as a desirable expenditure of their life energy (time) while others might find commuting regrettable and undesirable. Each person and household will hold different value sets yet a GPI at a regional scale should reflect the values held in common by most households, recognizing there will always be differences of opinion and values.

Each of the three GPI accounts — economy, environment and society — would be broken into sub-accounts, ledgers or wealth categories, as shown in Table 1. These GPI components are meant to stimulate discussion as to what is the appropriate list of components appropriate for measuring sustainability and well-being for Alberta. While certainly not complete, it represents a starting point in a process of constructing and improving such GPI accounts over time and in accordance with changes in the value of Albertans.

3.5. Sustainability Indicators, Indices and Composite GPI Index

From the GPI Accounts, key sustainability indicators could be derived to track sustainability and economic welfare at the national or regional level. For example, the forest account could yield a “timber sustainability index” that would show the trends in the sustainability of timber supply. The oil and gas account could yield an indicator of number of years of reserves remaining. The crime account would reveal crime rates and incidents of domestic violence. The time account would reveal an index of leisure time and life expectancy. These indicators, in combination with the balance sheet and income statement would be used as means of informing public policy decision making and engaging citizens about sustainability and well-being, as citizens experience life. Some of these indicators have already been developed in Alberta through the government’s performance measures (Measuring Up and ministry performance measures). What is lacking, however, is a an accounting framework in which these indicators could be used to understand sustainability and well-being in a holistic fashion. The proposed GPI Accounts provide a potential conceptual framework for accounting for both the qualitative/quantitative and economic (monetary) aspects of sustainability and well-being.

Raw data from the sustainability indicators can be converted into indices that show trends over time. Indexing involves establishing a benchmark or starting year or showing percentage change in an index against a predefined target. Indexing indicators also allow for aggregation of many indicators into a composite. The strength of composite indices is that they provide a very broad perspective of changes in a number of various indicators. Examples of such aggregate indicators include:

- The Index for Social Health (ISH) by Miringoff and adopted for Canada;
- The Edmonton Social Health Index (ESH), developed by Mark Anielski (1998) for the Edmonton Social Planning Council;
• The Pierce County (Washington) Quality of Life Benchmarks;
• The Minnesota Progress Indicators based, in part on the GPI model, and;
• The *Compass of Sustainability* for Orlando, Florida developed by Alan AtKisson.

An example of is the Edmonton Social Health Index (ESHI), developed by the Edmonton Social Planning Council, is a composite index of 15 key indicators of social health (see Figure 3). Pierce County (Washington) has adapted a similar system of indexing some 80 measures of Quality of Life into QoL index. The ESHI takes 15 distinct indicators and aggregates these into a single index, using equal weighting for each indicator. A base year, 1993 is selected as the benchmark year against which future progress (or regress) is measured.

**Figure 3**

![Edmonton Social Health Index (1993=100)](image)

The raw data indicator time series is used to develop indices by taking the ratio of any raw value indicator data point in any year ‘x’ relative to the benchmark year 1990 raw value indicator data. For all indicators, the year 1993 is set at a 100 basis points, against which future declines or improvements can be gauged. The benchmark year does not represent a target but rather a comparative value against which subsequent change can be compared. The higher the values (greater than 100) indicates an improvement in social health while a value less than 100 indicates a decline.

The GPI Accounts would provide information for indexing that would be useful for showing trends in individual indicators, a sub-aggregate of indicators, or aggregate indicators along the lines of economy, environment, and society. The indicators could reveal the change in key oikonomia and chrematistic variables over time and relative to a benchmark year. The indices would provide information on changes over time relative to some starting point and in relation to some sustainability or well-being target. Indices can be weighted according to the values of society or simply aggregated using equal weighting where relative importance cannot be discerned.

Even, a composite GPI Index is possible, that would reveal trends in overall genuine progress, from a qualitative perspective. Alberta GPI sustainability indicators, indices and a composite GPI index would provide citizens and decision makers a broad “state of the union” picture of current generational well-being and trends towards (or away from) sustainability and well-being objectives. The GPI indicators also allow decision makers to construct “what if” scenarios of future sustainability and welfare outcomes based on current trends.
4. Putting it all together: The forest account as example

Putting all the Alberta GPI Account pieces together might look like the following example, using the forest account as an example (see Table 4). This is meant to illustrate how a ledger (account), balance sheet, income statement, and indicators might be developed to account for sustainability of forest capital. The figures used in these tables are simply meant to illustrate how components of the accounts would relate to each other, just as accountants understand how the balance sheet and income statement relate to one another.

The forest account shows changes in both the area and volume of forest land, timber capital and non-timber resources. The income statement shows the flow of forest capital, including the annual growth rate that adds to timber capital stocks and depletions (harvesting, fire, insect, mortality, industrial development), which reduce timber stocks. The accounts can be expressed in both physical and monetary terms (either using market value of timber or economic rent estimates, where rent is the difference between the price of forest products less production costs). A “net sustainable income” would be revealed as would an index of timber sustainability (the ratio of growth to depletions) telling us whether we are consuming more or less than the “interest” (growth) of the timber capital stock.

Table 4

<table>
<thead>
<tr>
<th>LEDGERS</th>
<th>PHYSICAL</th>
<th>MONETARY</th>
</tr>
</thead>
<tbody>
<tr>
<td>FOREST RESOURCE</td>
<td>Beg. Year stock</td>
<td>Additions/ Growth</td>
</tr>
<tr>
<td>Timber Volume (million cubic metres; millions of dollars)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Timber volume (total)</td>
<td>2,150</td>
<td>45</td>
</tr>
<tr>
<td>Commercial timber volume</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Forest Area (million hectares; millions of dollars)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Forest (ha)</td>
<td>38,000</td>
<td>0</td>
</tr>
<tr>
<td>Productive and managed forest (ha)</td>
<td>22,500</td>
<td>0</td>
</tr>
<tr>
<td>Unproductive forest (ha)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Protected forest (ha)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Forest Recreation resources (ha)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Some figures provided as examples are based on 1994 figures for Alberta taken from the Alberta timber resource accounts (Anielski, 1996); others are hypothetical figures included for illustrative purposes. Natural growth or natural regeneration in both managed and unmanaged areas, and managed growth through reforestation and silviculture treatment. Depletions include harvesting (production), intentional industrial depletions (including clearing forest land for agricultural and energy (oil, gas, coal) development), and natural depletions (including fire, pests/disease, natural mortality). Note: some activities deplete the timber capital forest resource, others remove the land base from current and future forest use. Monetary value assumes an arbitrary $10/cubic metre for illustrative purposes.
Non-timber resources (various unit-of-volume measures)

<table>
<thead>
<tr>
<th>Resource</th>
<th>1,500</th>
<th>100</th>
<th>300</th>
<th>1,300</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total non-timber forest resources</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Watersheds</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Soils (including peat land)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Carbon</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Berries and plants</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wildlife</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Biodiversity (forest fragmentation)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**BALANCE SHEET**

**ASSETS**

<table>
<thead>
<tr>
<th>Natural Capital - Forests</th>
<th>Physical</th>
<th>Monetary</th>
<th>Liabilities</th>
<th>Physical</th>
<th>Monetary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Timber</td>
<td>2,178</td>
<td>21,780</td>
<td>Not Satisfactorily Restocking&lt;sup&gt;11&lt;/sup&gt;</td>
<td>51.5</td>
<td>515</td>
</tr>
<tr>
<td>Non-timber</td>
<td>1,300</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total forest</td>
<td>23,080</td>
<td></td>
<td>Total Liability, &amp; Net Worth&lt;sup&gt;12&lt;/sup&gt;</td>
<td></td>
<td>23,080</td>
</tr>
</tbody>
</table>

**INCOME STATEMENT**

<table>
<thead>
<tr>
<th>Category</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>GDP (value of timber/product sales)&lt;sup&gt;13&lt;/sup&gt;</td>
<td>150</td>
</tr>
<tr>
<td>+ unaccounted benefits (e.g., natural regeneration)</td>
<td>+ 100</td>
</tr>
<tr>
<td>+ carbon fixation benefits</td>
<td>+ 100</td>
</tr>
<tr>
<td>- regrettable expenditures (e.g., habitat, watershed, and slope restoration)</td>
<td>- 20</td>
</tr>
<tr>
<td>- depletion (e.g., land use transfers)&lt;sup&gt;14&lt;/sup&gt;</td>
<td>- 80</td>
</tr>
<tr>
<td>- depletion (loss of non-timber resources)</td>
<td>- 70</td>
</tr>
<tr>
<td>GPI (for the forest resource account)</td>
<td>180</td>
</tr>
</tbody>
</table>

<sup>10</sup> if this were to be included, then the value of recreation areas could be calculated using the Travel Cost Method of visitor expenditures or other non-market valuation methods.

<sup>11</sup> arbitrarily assumes a $10/m³ restocking charge

<sup>12</sup> this net worth figure implicitly includes the net income from the year that is reinvested in the forest resource on behalf of ‘shareholders’ (citizens, companies) and shows up in the assets

<sup>13</sup> this would include the sale of timber and other forest products. In this example, 15 of the 17 depletion amount was for harvest, and a $10/m³ price was assumed

<sup>14</sup> the volume and value of timber sold is included here, to show the depletion of the resource in exchange for an increase in GDP sales
INDICATORS and INDEXES

<table>
<thead>
<tr>
<th>numerator</th>
<th>denominator</th>
<th>ratio index</th>
</tr>
</thead>
<tbody>
<tr>
<td>Timber sustainability index (TSI)</td>
<td>17</td>
<td>45</td>
</tr>
<tr>
<td>Forest fragmentation index (FFI)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Return on Investment (ROI)</td>
<td>225</td>
<td>23,080</td>
</tr>
<tr>
<td>Benefit/Cost ratio, and/or NPV</td>
<td>595</td>
<td>370</td>
</tr>
</tbody>
</table>

The following Figure 4 shows by way of example the portrayal of the Alberta Forest Sustainability Index over time (taken from the Accounting for the Sustainability of Alberta’s Forests – 1995 Timber Account by Anielski (1996)).

Figure 4

The Timber Sustainability Index is the ratio of the volume of all forest depletions (harvesting, fire, land deletions) to the productive or sustainable capacity of the forest to provide timber supplies.

15 Selected indexes for the forest resource would then roll up into the composite indexes for: timber sustainability index, natural resources, environmental sustainability, and the GPI index (see diagrams within body of this document)
16 depletions divided by additions for the year
17 The forest fragmentation index would show the extent of disturbance of the forest land base over time due to harvesting, oil and gas activity, agriculture and other industrial activities on the forest land base over time (e.g., 1950 to 2000). The index be based on a percentage of forest land that remains in a state of “integrity” without fragmentation (based on World Resources Institute study of Canada’s forests and previous studies by Alberta Environment).
18 Net income for the year divided by net investment (net equity, or net worth)
19 A benefit/cost ratio can be derived, and/or an NPV based on a future stream of annual costs subtracted from a future stream of annual benefits, discounted over the years.
5. **The Details**

In Appendix 1 you will find a more detailed description of the individual components of the proposed Alberta GPI Accounts. We would welcome your review of these details if you have a particular interest or can offer words of advice on sources of information, studies or general guidance on how to proceed in measuring both the non-monetary and monetary aspects of each of the sub-accounts.

6. **Next Steps**

The next steps in the Alberta GPI accounting project will be to include your input to refine and improve the proposed Alberta GPI blueprint and then begin construction of the GPI Accounts. We are currently in the process of reviewing literature, data sources, methodologies, and consulting with experts in order to construct the pilot set of GPI Accounts for the period 1960-2000 (where feasible). The second stage of the project will extend from July 1, 2000 through to completion of the Alberta GPI accounts by December 31, 2000.

**GPI Blueprint**: The desired outcome is a blueprint or framework for accounting for sustainability and well-being for assessing the genuine progress of Alberta. The blueprint is intended to become the basis for constructing the first GPI Account for Alberta, which we hope, will be viewed as a process for continual improvement over time. The accounting system will be able to monitor both the qualitative-quantitative aspects of sustainability and the economic or monetary aspects (the total costs, benefits and productivity associated with total capital). The result will be a robust accounting system from which can be derived so-called “triple-bottom-lines” or trilogies of social, ecological and economic well-being or sustainability.

**Research of methods and indicators**: Canadian and international research, methodologies and indicators for the measuring the economic (monetary benefits and costs) and non-monetary aspects of sustainable development – social, ecological and economic capital – suitable for Alberta will be identified. GPI accounting methods already developed by *GPI Atlantic* and natural resource accounts for forests, nonrenewable energy resources, soils, carbon, air and water developed by Anielski and other researchers for Alberta will be considered. These accounts will updated or modified for purposes of the GPI Alberta project. Existing indicators and measures of sustainability currently monitored or reported by the Alberta Government and other federal government agencies will also be considered. Expenditure and cost data from government sources will be used (Statistics Canada, Government of Alberta public accounts) while other cost-benefit information not otherwise available from government sources will be drawn from other organizations and studies. This will also include an assessment of the types and nature of expenditures that currently make up the provincial GDP and economic/income accounts; attempting to distinguish between the expenditures by households, business and government that contribute to genuine and sustainable progress (and income) and those which are regrettable, undesirable or represent unsustainable practices.

**Consultation with stakeholders and researchers**: The Pembina Institute will consult with key stakeholders and researchers throughout the construction of the GPI account to ensure the best possible framework, methods, and data for accounting for sustainability and well-being. Researchers will be consulted for their input and opinions on appropriate methodologies and application of their respective research to the Alberta GPI account.

**Identification of experts and appropriate methodologies**: Leading Canadian and international researchers and policy analysts, who were identified in Phase I for their research work, will be contacted and consulted for the suitability of the results of their work to the construction of a pilot GPI Account for
Alberta. In addition, Statistics Canada and Alberta Government agencies will be consulted for statistical information and methodological advice to ensure appropriate methods for valuation, use of statistical data, and for the appropriate methods for indicator development that are reconcilable with national income accounting practices. Statistics Canada is currently working closely with Dr. Ron Colman providing advice to the GPI Atlantic initiative.

Data collection and analysis: Data for the construction of the Alberta pilot GPI Account will be collected from various sources including Statistics Canada and provincial government agencies. As noted, Statistics Canada will be consulted both for statistical information and for advice on measurement methodologies. The Pembina Institute will also consult with other government ministries, both federal and provincial, in gathering relevant statistical data for the construction of the account. Where possible a times series of data from 1960 to 1999 will be developed.

Construction of the Genuine Progress Indicator account: The GPI Account will be constructed with three sub-accounts—economic, social and ecological capital sub-accounts. Each sub-account will contain non-monetary (qualitative) indicators and monetary values (total costs and benefits) associated with the various indicators of sustainability contained in these accounts. From each sub-account a composite qualitative index of sustainability and a monetary “bottom line”, that accounts for the total costs and benefits of social, economic or ecological capital, will be derived. The three sub-accounts could potentially be integrated into a composite Sustainable Progress Index, expressed in both qualitative and monetary terms.

Models for scenario analysis: Potential analytical models or tools that would allow decision makers and policy analysts to assess the “whole systems” interrelationships between indicators within accounts and between accounts will be examined. For example, the use of Stella analytical software may be considered as a future step in the design of tools that allow users to query the GPI Account and to explore relationships between components of the Account as well as conducting “what-if” scenario analysis of sustainability outcomes using the historical GPI Accounts. Such tools would provide policy decision makers with the capacity to assess current and future sustainability outcomes that are linked to goals for the quality of life and well-being of Albertans.

Please email, mail or fax your comments to:

Mark Anielski (anielski@ualberta.ca)  
9847 - 90 Avenue, Edmonton, Alberta, Canada, T6E 2T2  
Tel: 780-491-0696 Fax: 780-492-3325
Appendix 1: Details of the Alberta GPI Accounts

For the benefit of reviewers of the Alberta GPI Accounts we provide a preliminary outline to how the GPI Accounts will be constructed. We welcome your input or suggestions for data and studies that would support the development of these accounts. Each account would contain physical (quantitative, qualitative) data as well as a full cost/benefit estimate (where appropriate).

A. Economic Sustainability Indicators Account

_Economy_

1. GDP (gross domestic product)
   - Personal Consumer Expenditures
   - Government Expenditures
   - Government Investment in Fixed Capital
   - Business Investment in Fixed Capital
   - Business Investment in Inventories
   - Exports less Imports of Goods and Services

The GDP is a useful measure of the “gross” expenditures or income in an economy. The original GPI begins with GDP, specifically personal consumption expenditures by households on goods and services by households, which constitutes the majority of the GDP. Data is available from Statistics Canada and from the Alberta Economic Accounts produced by Alberta Treasury, providing sufficient details. Trade data should also be analyzed including the value and physical volume of exports and imports for Alberta. Data would be reflected both in terms of a GDP index (converting monetary values to an index showing trends) as well as the monetary expression of the GDP statistics.

2. Expenditures by type and by households, business and government (indexed)

The expenditure account will examine trends in the spending patterns of households. Are expenditures on housing, transportation, and recreation rising over time relative to other expenditures? Is there an intergenerational difference in spending and what does this suggest about future well-being and economic capacity for young Albertans? Data for household expenditures is available from Alberta Economic Accounts with detailed expenditure breakdown for Edmonton and Calgary from FAMEX data. Expenditures by business are also available from the Alberta Economic Accounts. This household expenditure data is also critical for estimating the “ecological footprint” of household consumption practices (identified later in the GPI Account). Government expenditure data that expresses intermediate investments in human, social and environmental well-being are available through assessment of Alberta’s Public Accounts, revealed expenditures (investments) by ministerial portfolio.

_Financial_

3. Debt and net foreign borrowing: government, household and business (indexed)

Financial debt and indebtedness to foreigners imposes a constraint to Alberta households, business and government. Total debt and the amount of interest paid on debt of government, households and business will be assessed, data permitting. We are uncertain whether data on actual interest payments on household and business debt exists on all forms of debt (mortgages, car loans, business loans, credit cards, student loans). Statistics Canada and Bank of Canada data will be reviewed. Debt servicing exacts a significant toll on human capital (time) and natural capital in the fashion that debt repayment must come from the consumption of both time (labour) and natural capital that grows more onerous a burden over time through the impacts of compounding debt. While the issue of debt and money creation (through debt instruments, i.e. loans and bonds) is one of the most significant liabilities for sustainability it is the least understood and most obfuscated issue in the sustainability debate. We will also examine the net debt position of the Alberta Government taken from Measuring Up and other government sources.
4. **Savings (government, household)**

The degree of savings by households and governments is one determinant of the financial health of a society and economy. The savings account will examine savings rates by Alberta households and the savings rate by the Alberta Government from oil and gas royalties into the Heritage Trust Fund. Questions might be asked such as “did the province earn a sufficient return on their oil and gas capital (royalties and taxes) and was a sufficient amount saved over time to yield a stock of financial capital (savings) to provide a sustainable income stream for future generations when the oil and gas run out?”

**Livelihood: employment and income equity**

5. **Employment, unemployment and underemployment (see also Time Use Accounts)**

Full versus part-time employment is an important indicator of the livelihood of households. Unemployment and underemployment are also critical since they impose a cost of the well-being of both individual households impacted and on the community. Underemployment means a loss of productive human energy available to do meaningful work. Underemployment, as in the US GPI, will be estimated both in terms of total hours of underemployment (relative to total hours of employment) and the economic cost of underemployed workers. Data will be drawn from a more comprehensive estimates of time use accounts.

6. **Income, living wage, and poverty (people living below living wage)**

Sufficient income to meet basic needs is critical to a sense of well-being by individual households and to the community. This account will examine trends in median and average income (by family type) drawing from Alberta Government (Measuring Up) and Statistics Canada sources. We know, for example, that average income of single moms is low and has declining since 1981 making these families/households more vulnerable to poverty than others. This account will also attempt to work towards an estimate of a “living wage” based on methods used in some US measurement initiatives. A living wage is the amount of money (per hour or day) required to achieve a level of existence and full participation in a community (beyond simply basic needs). Also, trends in poverty will be examined looking at newly emerging government measures of poverty using the MBM (market basket measure) approach for defining a “basic needs” poverty line.

**Equity**

7. **Equity: income and wealth inequality (inter- and intra-generational)**

An egalitarian society whereby the gap between rich and poor is narrowest may exhibit social and human capital dividends (e.g., higher life expectancies) that go unaccounted for. Growing inequality of income (and wealth), for example in the US, suggests a growing liability or cost to social cohesion, a sense of community and connectedness. A number of methods for measuring inequality will be examined including the conventional Gini coefficient of inequality, used in the US GP and a common measure of income inequality.

**Infrastructure**

8. **Household durables (infrastructure)**

The money households spend on durable goods, such as a car, a refrigerator and other appliances, is not a good measure of the actual value received from the services these goods provide. The GDP does not account for the value of services derived from such household durable goods. It is also important to account for the life span of such durables as a furnace, car, or dishwasher. For example, when we buy such items we do not “consume” them in one year; yet this is how GDP accounts for such purchases. The car or dishwasher provides the household with services for a number of years. If it breaks down, then the durable is repaired or replaced. Both repairs and replacement drive up the GDP. Often durables wear out faster than they probably should requiring more frequent replacement of durables had they been manufactured for longer service life. Thus households would have been better off, getting more value, if the appliance had been engineered for higher quality and a longer service life.
The GPI Accounts treat the services of durables, such as appliances, as benefits and the initial purchase prices as a cost. The annual services that are derived from the use of these consumer durables are added up, which economic theory defines as the sum of the depreciation rate and the interest rate. The GPI would estimate the value of services derived from the initial benefits of the purchase of a stock of consumer/household durable goods (e.g., appliances, furnace, dishwasher) whose annual services are valued consistent with the sum of the depreciation rate and the interest rate of such goods and services as economic theory defines (i.e. the opportunity cost of income invested). To avoid double counting, an adjustment is made for the cost of these consumer durables by subtracting in the GPI the actual expenditures on consumer durables. Focusing on the net annual service that household appliances and equipment provide rather than on the purchase price, corrects the way GDP treats money spent as if it were the same as the value received from the durable good.

9. Public infrastructure

The value of services to households and businesses from public infrastructure, such as streets and highways, bridges, hospitals, schools and other public works are ignored in the GDP figures. The GPI Accounts would attempt to measure the economic value of services to persons from various forms of public infrastructure, expanding beyond the US GPI estimates for streets and highways.

Transportation and Trade

Transportation is a critical factor in our trade-oriented economy. In fact, transportation-related expenditures are the second most important expenditure item for Alberta households after housing. Yet the full costs of transportation are not considered in the GDP and national income accounts. The transportation accounts would take their lead from current work by Statistics Canada and GPI Atlantic in pioneering this work. Various tools exist for measuring transportation costs including:

- A 1996 KPMG study of the full cost analysis of transportation for Edmonton
- Victoria’s “Transportation Cost Analysis” analytical software
- The BC Ministry of Transportation and Highway’s “Monetization of Environmental Impacts of Roads” (March 1997)
- the Canadian Automobile Association’s estimates of fixed and variable automobile costs

There are many aspects to transportation account, which may overlap with other accounts requiring careful attention to avoid double-counting. Included in the transportation accounts would be:

- the non-environmental benefits and costs like the services of highways and roads
- the cost of automobile accidents
- commuting time and the cost of commuting
- public transit use and the full costs/benefits
- commercial transportation both in terms of volume and full cost/benefits

10. Commuting and public transit

Commuting time to and from work or in running errands is an important investment of our life’s energy yet no account is made of the value lost due to time spent commuting. The GPI Account, like the US GPI, would examine trends in commuting time and use of public transit, including a full cost analysis of commuting both in terms of the value of time and other social and human costs.

11. Commercial transport

The above noted studies and analytical tools will be examined to determine how appropriate they are for full costing of commercial transportation of goods and services. Are we efficient in terms of transportation and does this trade flow in fact lead to a sustainable, self-reliant future?
**Economic Sustainability Index**

A composite index of economic sustainability will be estimated based on a composite of the above subaccounts expressed in both non-monetary and monetary terms.

**B. Societal Sustainability Indicator Account**

**Time Use**

The time-use accounts would examine trends in how Albertans invest their time (life-time energy) according to the following categories:

12. **Paid work**
13. **Unpaid work-time**
14. **Unpaid housework, parenting and eldercare**
15. **Volunteerism**
16. **Leisure time**
17. **Commuting time**
18. **Employment, involuntary unemployment, underemployment, and overtime**

How do Albertans invest their time? Are we working more than ever before from the perspective of the household? Do we have more or less leisure time than in 1960? Are we spending more time commuting to and from work? Are some of us underemployed while others are working excessive overtime? What are the full costs and benefits associated with these issues and how should we value time? These are the many issues addressed in the time use accounts. Much of our investment of time in unpaid housework, parenting, eldercare and volunteerism goes unmeasured as a benefit in the Alberta GDP accounts, yet this investment of time is significant. Preliminary estimates for Alberta show that volunteerism contributes roughly $4.2 billion in economic value (based on replacement cost of labour) or more than 4% of the value of Alberta’s 1998 GDP. The replacement value of these forms of unpaid work will be considered using time-use survey studies by Statistics Canada and the works of leading scholars in Canada and US. Also, **leisure time** is not measured as such nor is the cost of lost leisure time for household well-being considered. **Commuting time** is also an important investment of life-time energy for many households but is not accounted for as a cost to household well-being in the GDP. The trends in employment, unemployment and underemployment as well as the quality of work (and satisfaction) will be examined.

**Social Capital**

Social capital is critical to the sense of well-being and community experienced by households. The state of social cohesion is critical to a sense of personal safety, freedom and overall quality of life. There are many social costs that are counted as benefits in the GDP. For example, the cost of incarceration and building new prisons actually increases GDP rather than being considered as a regrettable social cost. Family breakdown (divorce) contributes to the GDP as two parties part ways, hire lawyers and counselors and establish two separate households.

19. **Crime and violence**

The trends in crime and violence will be assessed over time as well as estimates of the full costs of crime. Much of the pioneering work in this area has been done by Ron Colman and his GPI Atlantic team in their cost of crime studies for Nova Scotia. The Alberta GPI hopes to build upon this benchmark work and develop a full cost/benefit account of crime and violence for Alberta considering such things as the true cost of incarceration and the potential benefits from alternative dispute resolution processes that would mitigate traditional costs.

20. **Family breakdown**

Divorce and breakdown of relationships contributes enormously to the GDP yet it is questionable whether such expenditures should be considered as contributing to economic progress or be considered a regrettable expense. Most of us who have experienced family breakdown would lament the costs of cleaning up after our broken relationships – the legal fees, counseling and immeasurable cost to our health of stress and anxiety. And the mental and social costs to our children impacted by family breakdown. The Alberta GPI will examine both trends in family
breakdown and estimate the full cost to households. Based on our experience with the US GPI, these estimates are notoriously difficult and controversial.

21. Voter participation
22. Democracy (days in legislature and use of closure on debate)

*Freedom and democracy contribute to the sense of well-being and social capital. Trends in voter participation and in democratic process (days in the legislature and public policy debate) are two potential indicators of the health of democracy. How inclusive and empowered citizens feel in shaping public policy is also critical to a sense of freedom and stewardship of the well-being of the community. However, putting an economic value on democracy is difficult.*

Knowledge Capital

23. Educational attainment

Knowledge or intellectual capital is an increasing important cornerstone of a strong and resilient economy. Proxies for knowledge capital include the level of education attained by Albertans. Many of these indicators are already being measured by the Alberta Government in Measuring Up and ministry performance measures. The GPI Account intends to extend these indicators back to the 1960s or 70s. The value of knowledge capital is difficult to ascertain, though data shows that a highly educated workforce receive higher wages, as is the case in Alberta.

Health and Wellness

24. Life expectancy and quality of living
25. Unhealthy lifestyles
26. Premature mortality
27. Disease
28. Auto accidents
29. Infant mortality and low birth weight
30. Teen pregnancy
31. Suicide
32. Aboriginal well-being
33. Substance abuse (drugs, alcohol)
34. Gambling

Health and wellness encompasses a broad range of issues. The GPI Accounts will attempt to develop time series for each of the above categories showing both the trends (quantitative/qualitative) and estimate the full costs to health and wellness from such things as unhealthy lifestyles (obesity), auto accidents, substance abuse and gambling. Issues such as Aboriginal (First Nations) well-being are critical even if we are focusing on a subset of society and households. Many of these accounts have an existing data set established by the Alberta Government, Health Canada or other government agencies. We will draw on these data sets to establish longitudinal accounts of changes over time and develop full cost/benefit estimates where appropriate and available data/studies exist.

*Social Sustainability Index*

An overall index for societal sustainability can be derived summing up the indices for each of the above components. In addition a full cost/benefit analysis of social parameters can be estimated from the GPI Accounts yielding a “societal well-being bottom line.”

C. Environmental Sustainability Indicators Account

The environmental and natural capital accounts will be constructed on the basis of natural capital accounting standards that have emerged in the last 10 years through Statistics Canada’s *Econnections* national natural resource accounting initiative, the United Nations expanding system of national accounts to include environmental assets, the World Banks’ total wealth accounting initiative, and based on the recent US National Research Council’s recommendations in *Nature’s Numbers*. The construction of a completed set of natural capital and environmental accounts for Alberta will require more time and a sustained commitment by government.
35. Ecological footprint (food, energy, clothing) and industrial footprint (eco-efficiency)

The Ecological Footprint (EF) developed by Bill Rees and Mathis Wackernagel provides a meaningful estimate how much land and resources are required to meet our current demands for energy, food, transportation, and other household needs. The EF analysis is based on household expenditure data from Statistics Canada. Jeff Wilson, who estimated the EF for Nova Scotia will be constructing the EF for Alberta. Attempts will be made to develop an industrial footprint for industry that examines the amount of energy and materials consumed by Alberta industry (including agriculture). Issues of resource or eco-efficiency will be examined.

Natural Resource Accounts

36. Nonrenewable energy resources (oil, gas, gas-byproduct) – reserve life

How many years of oil and natural gas remain? How long will the oil sands and coal resources last? Are Albertans receiving a fair share of the profits from consuming oil and gas natural capital? Are sufficient provisions being made to for sustainable income flows when the oil and gas run out? What are the full environmental costs of producing oil and gas resources? How energy efficient is oil and gas production? The nonrenewable energy resource accounts will examine the stock, flow, and reserve life of oil, gas, gas-byproducts and coal resources. The monetary values of this most important natural capital will be estimated. Also, issues of sufficient resource rent collection (royalties and taxes) and reinvestment of these revenues into government savings accounts (i.e. Heritage Savings and Trust Fund) will also be examined.

37. Subsoil resources (minerals)

Minerals such as diamonds are also increasingly valuable as a form of natural capital. The mineral accounts will attempt to assess the stock, flow and market value of this natural capital.

38. Forests (timber and non-timber resources)

Forests cover over 55% of Alberta’s land base and provide timber capital for Alberta’s forest industry providing financial and employment benefits to Alberta businesses and communities. In addition forests provide other ecological service benefits including watersheds, carbon sinks, wildlife habitat, forest recreation, and clean air. But are Alberta’s forests sustainable for both timber and ecological services? What are the long liabilities of forest fragmentation due to oil and gas development to ecosystem health and timber supply? What are the full costs of forest harvesting and loss of old growth forests? What is the real rate of return on each tree harvested? What are the carbon sequestration benefits of forest to address climate change? Forest and carbon accounts previously developed by Mark Anielski in 1992 and 1996 will be updated, adding to the accounts the strength of nontimber values identified in the GPI Atlantic forest accounts being completed by Sara Wilson (who will join the Alberta GPI team in August).

39. Wetlands

Wetlands play an important ecological service in terms of water regimes and habitat for wildlife. What is the status of wetlands? How much have we lost over time? What are the full economic benefits and costs associated with wetlands? Total benefits of wetlands were estimated by Costanza et. al. for the value of ecosystem services, which were used in estimating the value of lost wetlands in the US GPI. The Alberta GPI Account would consider the same methodologies attempting to adjust for relative values of wetlands in the case of Alberta.

40. Peat land

Peat land plays a vital ecological service both as a filtration system for clean water and as a massive store of carbon. Indeed, there is more carbon embodied in peat lands than in forests or other biomass. The peat land account hopes to examine some critical questions such as: What is the current state of Alberta’s peat lands? How much is being
mined for horticultural purposes, windrowed for agricultural development, or burnt as a source of biomass fuel? How much carbon do peat lands sequester on an annual basis? What are the full benefits of these ecological services and what are the full costs of degrading Alberta’s peat land?

41. Soils and agricultural land (erosion, productivity)

The quality and productivity of agricultural and other soils is critical to sustained harvest of crops, livestock production and forest management. Yet what do we know of the current state of soils in Alberta? Are they being degraded or sustained in terms of their integrity and productivity? How would we measure soil productivity? Current measures for land sustainability use crop production per unit of land area as a proxy (see Alberta Government’s *Measuring Up*) but is this adequate? What is happening to the organic layer of agricultural land? How much fertilizer and pesticide do farmers apply every year to the land to maintain yields and what impact does this have on ground water quality and long-term soil productivity? How does organic agriculture compare with non-organic agriculture both in terms of magnitude and the full benefits and costs? Dr. Mel Lerohl’s 1992 study to develop soil erosion accounts for Alberta dating back to 1900 would be used along with more current studies of soil productivity. The account will draw from early knowledge gained in the soil productivity studies undertaken most recently by Agriculture Canada and Alberta Agriculture, Food and Rural Development. Mention current efforts by Agriculture Canada and Alberta Agriculture in establishing soil quality plots to monitor changes in soil quality and productivity. Consider other proxies like organic layers and yields (crop, livestock) as proxies of productivity. Also, look at loss of prime agricultural land to urban and industrial development. These are some of the critical issues that need to be examined in a soil and agriculture account.

42. Carbon

Carbon has become an important and strategic “resource” to be managed with regards to global climate change. What are the current carbon dynamics in the province comparing total anthropogenic (industrial, household, government) emissions of carbon and GHG (green house gases) versus the capacity of natural systems (forests, soils, peat lands) to sequester any of this additional carbon? What is Alberta’s carbon “deficit” or “carbon trade surplus” or “carbon footprint?” on Canada and on North America? How will this be impacted by the massive expansion of oil sands and natural gas production? What is the full cost and benefit of carbon sequestration services by natural systems? These are some of the issues to be addressed.

43. Fish and wildlife (populations, endangered status, species diversity, and habitat integrity)

The fish and wildlife accounts would examine a wide range of issues of status of wildlife, integrity of habitat and population health. Studies by the federal/provincial governments into the economic importance of wildlife to Canadians demonstrate that fish and wildlife do provide important economic benefits. While it may difficult to impute a full cost/benefit value attributed to fish and wildlife, it is important to Albertans to understand the health of our natural wildlife populations and the impact that our consumption and resource development is having on their quality of life.

44. Parks and wilderness

The parks and wilderness account would be a subset of other land accounts (forests, agriculture) that would examine the change in area designated as parks, wilderness or area under protected status. Drawing from various sources, this account will examine the trends over time. The economic value of parks and wilderness will also be examined using various studies that have addressed the issue of comparing a unit of land for parks versus other industrial use, like forestry or oil and gas development.

45. Ecosystem integrity (fragmentation)

One of the most challenging accounts is estimating ecosystem integrity or biodiversity. What is the current health or status of Alberta’s ecosystems? How does forest fragmentation affect ecosystem health and does this impose a long-term liability for ecological services? What are the full costs of resource development if one considers long-term costs of degradation of ecosystem integrity? These are challenging questions that will take years to resolve and to fully understand.
Environmental Quality Accounts

46. Air quality and GHG emissions (long-term environmental costs)

Air quality and GHG (green house gas emission) accounts will examine trends in ambient air quality (as measured by government standards) as well as examine trends in total emissions by type of emission. Emissions trends would consider all emissions, including carbon dioxide and water vapour estimates from industrial processes. The long-term environmental damage (costs) and liabilities due to air emissions and from petroleum, other industrial and household production will be considered (as per the US GPI account). This cost relates to the long-term costs of global warming linked to current consumption of fossil fuels whereby long-term costs is estimated by multiplying a per barrel equivalent price (a tax) on current production of non-renewable energy to compensate future generations for economic damage of global warming. What is the full cost of air pollution on human and ecosystem health? A recent study by the Ontario Medical Association attributes significant economic cost and 5,000 human lives lost per year to air pollution. What are the costs to Albertans? The air quality accounts will follow the US GPI account as a model with consideration of a more expanded account of the total costs of emissions.

47. Water account (surface and ground) quality and flow

The water accounts would address issues such as trends in the quantity, flow and quality of both surface (rivers, streams) and ground water. What are the full costs to recreation, aesthetics, ecological and property values, plus the quality of household and commercial water supplies adjusted annually by changes in water quality and siltation rates.

48. Noise pollution

Noise pollution is perhaps one of the least accounted for issues yet it impacts everyone. Noise can be an important factor for quality of life particularly in urban settings. The damage caused by noise pollution in the U.S. in 1972 was estimated at $4 billion ($12.0 billion in 1992 chained dollars) by the World Health Organization (see 1972 Congressional Quarterly Almanac, p. 980). What are the true costs of noise pollution to auditory health and how does proximity to noisy streets and corridors affect both property values and our feeling of well being? At this stage, we have no knowledge of noise pollution estimates for Alberta.

49. Ozone depletion

The historical use of CFCs and other ozone-depleting substances has had long-lasting impacts on the earth’s ozone layer. The US GPI for 1998 reported that “From November 1978 to October 1986, the amount of ozone in the stratosphere above the mid-northern hemisphere declined by somewhere between 4.4 percent and 7.4 percent (David Health of NASA’s Goddard Space Flight Center, testimony in Ozone Layer Depletion, p. 32). The resulting increase in ultraviolet radiation will cause a higher incidence of skin cancer, particularly among fair-skinned people. The risk of malignant melanoma is already rising: from a lifetime risk factor of 1 in 600 in 1950 to 1 in 135 in 1987 (Darrel Rigel, testimony in Ozone Layer Depletion, pp. 70-80). Yet, human skin cancer represents the least ecologically significant effect of increased UV radiation. Unlike humans, plants and animals (such as frogs) cannot readily protect themselves from these higher levels. The ecological effects could be catastrophic.” What impact Alberta has on the earth’s ozone layer is not clear and will be explored in this subaccount.

50. Toxic waste (production and releases)

How much toxic waste do Alberta’s households, industry and government produce each year? What is the accumulated stock of toxic waste in the province, either in storage (deep well and other) or awaiting destruction through the Bovar facility? What are the long-term liabilities (costs) of toxic waste production and stocks? These are some of the issues the toxic waste account will address.
51. Solid waste (landfill)

How much solid waste does the households, businesses and governments of Alberta produce each year? How much is diverted from landfills and recycled? What are the long-term environmental costs (liability) of existing landfills to health and environmental quality? The solid waste account would be closely tied to the ecological footprint analysis given that it relates directly to the volume of goods we consume and process through our households.

Environmental Sustainability Index
A composite index, both in monetary and nonmonetary terms will be estimated based on the above accounts.

= GPI Index (composite)

The composite GPI Index would be expressed both in monetary terms (like the US GPI) and in non-monetary (indexed) terms using equal weighting for each parameter will allowances for sensitivity analysis based on values expressed by Albertans to help discern the relative importance of each component in the GPI Account.
Appendix 2: GPI Alberta Advisors and Reviewers

The following figure shows a preliminary list of advisors and contributors to the Alberta GPI project. Mark Anielski has contacted many of you during the past year. Some of you might be called “Friends of GPI.” The list of advisors include experts in national income accounting, economists, accountants, sociologist, human ecologist, biologists, foresters, criminologists, demographers, consultants, politicians, theologians and government policy advisors. We welcome as many contributors as possible to the construction of the “Alberta GPI House” given that many hands and minds will make the journey light.

Alberta Genuine Progress Indicators Pilot Project
Network and Advisors

Pembina Alberta GPI Team:
- Mark Anielski (Project Leader)
- Mary Griffiths (Senior Researcher)
- Amy Taylor (Senior Researcher)
- Barbara Campbell (Senior Researcher)
- David Pellock (Senior Advisor)
- Sara Wilson (Contract Researcher)
- Jeff Wilson (Contract Researcher)
- Stephanie Cairns (Advisor)

Advisors:
- Dr. Harvey Krahn (demographics)
- Dr. Tom Noseworthy (health)
- Dr. Chris Soskolne (environment & health)
- Sharon Mathias (health)
- Dr. Kim Travers (nutrition-health)
- Dr. Laura Shanner (bioethics)
- Dr. Allan Tupper (political science)
- Dr. Jane Ross (crime and law)
- Dr. Tim Hartnagel (crime)
- Dr. Janet Fast (value of unpaid work)
- Dr. Gary Smith (gambling)
- Dr. Sandra Niessen (human ecology)
- Dr. Sharon Jamieson (education)
- Dr. John Cobb (theologian)
- Dr. Marilyn Waring (New Zealand)
- Dr. Vic Adamowicz (nonmarket values)
- Dr. Ray Rasmussen (environment-business)
- Dr. Terry Veeman (sustainable development)
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- Dr. Vic Adamowicz (economy & environment)
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Christopher Smith
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Grant Smith
Robert Smith
Roger Smith
Chelsea Somerville
Colin Soskolne
Kim Speers
Sherrelle Steele
Brad Stelfox
Harry Stelfox
Chuck Sterling
Brian Stocks
Thom Stubbs
Paul Swann (UK)
John Thompson
Kim Travers
Marvin Trimble
Adepeju Tunji (Nigeria)
Dan Tunstall (US)
Allan Tupper
Wayne Tymchuk
Casey van Kooten
David Van Seters
Terry Veeman
2 Webster’s Third International Dictionary, 1976.
6 “Aristotle made a very important distinction between “oikonomia” and “chrematistics.” The former, of course, is the root from which our word “economics” derives. Chrematistics is a word that these days are found mainly in unabridged dictionaries. It (chrematistics) can be defined as the branch of political economy relating to the manipulation of property and wealth so as to maximize short-term monetary exchange value to the owner. Oikonomia, by contrast, is the management of the household so as to increase its use value to all members of the household over the long run. If we extend the scope of the household to include the larger community of the land, of shared values, resources, biomes, institutions, language, and history, then we have a good definition of ‘economics for community.’” (Daly and Cobb, 1994; 138)
8 In The New Republic, October 20, 1962