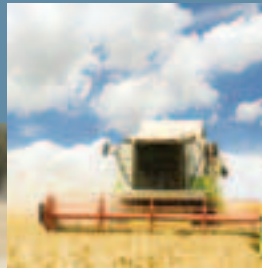


# Ecosystem Services Market Policy Framework:

Integrated Solutions for  
Greening Alberta's Growth



March 2010





## Institute for Agriculture, Forestry and the Environment

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March 18, 2010

Premier Ed Stelmach  
Room 307, Legislature Building  
10800 – 97th Avenue  
Edmonton, Alberta  
T5K 2B6

Dear Mr. Stelmach:

On behalf of the Board of the Institute for Agriculture, Forestry and the Environment (IAFE), I am very pleased to transmit to you the *Ecosystem Services Market Policy Framework: Integrated Solutions for Greening Alberta's Growth*. When implemented, the framework will address all three components of our mandate.

The IAFE Board commends the Government of Alberta for its foresight in moving to a market-based approach for providing ecosystem services. Implementing this policy framework will result in a more competitive and innovative natural resources sector, strengthening Alberta's position of leadership and excellence. It will allow the province's land managers to exhibit their entrepreneurial spirit and innovative nature and to supply ecosystem services and the next generation of consumer-driven products.

Over the past two years, we have engaged many local and international experts with experience in the use of market-based approaches for ecosystem services. In addition to holding an International Think Tank and several workshops, the IAFE has had over 100 meetings with key Alberta stakeholders representing industry, government (provincial, federal and municipal), academic institutions and environmental non-government organizations. The information and advice from these discussions was instrumental in helping us develop the policy framework.

The Board has concluded that introducing a coordinated, integrated market for ecosystem services offers many benefits to the Government of Alberta, to firms doing business in this province, and to Albertans as a whole.

Such a market system will benefit the Government of Alberta by:

- Supporting the Government's vision and goals for sustainable development.
- Enabling enhanced environmental outcomes, improved system efficiencies, reduced duplication and the need for direct government intervention while respecting current budget constraints.
- Encouraging partnerships for ecosystem management within Alberta rather than relying solely on government.
- Enabling existing policy direction and promoting the use of policy instruments that are based on performance or outcome, are verifiable and yield measurable results.

Benefits to Alberta businesses include:

- More investment certainty through a performance-based approach that rewards innovation and improved efficiency.
- A more robust and certain environmental compliance framework for industrial land users, resource-based companies and urban developers.
- A broader stream of resource revenues for firms that enhance their environmental performance and go beyond compliance.

For Albertans as a whole, an ecosystem services market would:

- Create opportunities for new jobs as a result of healthier resource industries, increased investment in Alberta's economy and the formation of new businesses needed to support the market operation.
- Enhance water quality and quantity, wildlife habitat, recreation opportunities, scenic beauty and biodiversity.
- Provide a way to more fully recognize the value of and better protect the essential ecosystem services that contribute to Alberta's high quality of life.

The Ministers of Agriculture and Rural Development (as lead agent), Advanced Education and Technology, Environment, and Sustainable Resource Development were mandated to work together to support the IAFE in its work. The efforts of these departments combined with the contributions of other organizations, inside and outside of government, that worked with us over the past two years are an outstanding example of the creativity and innovative thinking that can emerge from integration and coordination across agencies and disciplines.

As chair of the IAFE Board, I am grateful to have had this opportunity to help enhance Alberta's reputation as an innovator and a leader. I thank my fellow Board members and all those who have contributed their energy, expertise and enthusiasm to this project.

Sincerely,

*[original signed]*

Dr. Ken Nicol

Chair, Institute for Agriculture, Forestry and the Environment

cc: Hon. Jack Hayden  
Hon. Doug Horner  
Hon. Mel Knight  
Hon. Rob Renner

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# Integrated Ecosystem Services Markets — A Transformational Approach

This Ecosystem Services Market Policy Framework is a response to the Government of Alberta's desire for an integrated policy approach that:

- Achieves environmental outcomes.
- Improves industry competitiveness.
- Expands business opportunities and investment in Alberta's agriculture and forestry sectors and in other resource-based industries.

These outcomes are linked, as “[M]any of the nations with top-tier competitiveness rankings also have strong environmental performance scores.”<sup>1</sup> Accepting this approach to the provision of ecosystem services means that government policy should first consider the use of market-based approaches to achieve environmental outcomes that go beyond compliance and result in innovation and improved system efficiency.

A market approach offers flexibility and increased certainty by clearly defining the expected outcomes then leaving it up to businesses to determine the

most innovative and effective ways to meet and, where the market supports it, surpass environmental requirements. This Framework outlines an innovative, high-level process for making informed choices about using the important tools and mechanisms identified in the *Land-use Framework* and other Government of Alberta policies and legislation.<sup>2</sup> The Ecosystem Services Market Policy Framework fosters sustainable development and supports the Government of Alberta's vision — a vision that reflects the significance of natural resources to Alberta's economic, environmental and social well-being:

“An innovative and prosperous province where Albertans enjoy a high quality of life built on vibrant communities and a healthy environment.”<sup>3</sup>

Traditional “command and control” approaches fail to capture the real value of ecosystem services, largely because these services are viewed as being

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- 1 Esty, D. & Porter, M. (2001). Ranking National Environmental Regulation and Performance: A Leading Indicator of Future Competitiveness? In *The Global Competitiveness Report 2001-2002*. (p. 95). New York: Oxford University Press. Available online: <http://www.isc.hbs.edu/soci-environmental.htm>
  - 2 The *Land-use Framework* and the *Alberta Land Stewardship Act* mention conservation offsets, conservation easements, conservation directives, transfer of development credits, and a conservation exchange. Examples of other policies and legislation with potentially applicable mechanisms include *Water for Life*, the *Water Act*, and *Launching Alberta's Energy Future: Provincial Energy Strategy*.
  - 3 Government of Alberta. (2009). *Budget 2009: Government of Alberta Strategic Business Plan*, p. 1. Edmonton: Government of Alberta. Online at <http://www.finance.alberta.ca/publications/budget/budget2009/govbp.pdf>.





“free” and their scarcity is not reflected in existing commodity prices. Market-based approaches identify this value by using market instruments and appropriate policies to incent resource management practices that encourage the protection, maintenance and restoration of ecosystem services, all within a legislative framework that ensures ecological, social and cultural objectives are met. Establishing a functioning marketplace or a market incentive that enables the transparent, simple exchange of new products or services (in this case, ecosystem services) is fundamental to effective and efficient trading. To support these new market approaches and achieve these objectives, enabling legislation is required.

A market approach opens up new business and revenue opportunities in Alberta’s natural resource sectors, including agriculture and forestry. The ecosystem service marketplace provides the pivotal link between those willing to pay for actions that improve and protect the environment, and those who manage the resources and can take the actions that deliver the desired outcome. A marketplace for ecosystem services will shift compliance from a strict business cost or liability to a market opportunity or asset on the balance sheet.

Alberta and Canada have well-established commodity markets built on natural advantages and strengths in diverse resource sectors. Alberta’s experience and willingness to innovate, its significant amount of natural capital, its scale of production, its size of contiguous undisturbed landscape, and its relatively small number of large landholders are all assets that make the proposed marketplace for ecosystem services possible. Alberta also has a strong tradition of leadership and creativity in integrating economic, environmental and social considerations, and is committed to continuing to identify and act on new opportunities to align environmental and business outcomes.

The Ecosystem Services Market Policy Framework is built on a foundation of innovation and entrepreneurial attitude. Successful implementation of the Framework will require innovation at numerous levels. Innovation will encompass the development and application of new and adapted processes, systems, institutions, science and tools that will encourage and enable land managers to achieve the environmental outcomes desired by Albertans.

Entrepreneurial attitude reflects the willingness to evaluate options, take the risks, and reap the rewards of innovation. As the Framework is applied, it will stimulate innovation that:

- Is adaptive and flexible in achieving outcomes.
- Builds and uses collaborative networks to promote opportunity.
- Strengthens entrepreneurship by giving more choice.
- Stimulates ongoing research and development on new instruments and new structures.

Various Alberta policies already support the use of a market-based approach to natural resource management; examples include the *Land-use Framework*, the *Water for Life Strategy*, and *Launching Alberta’s Energy Future*. As a policy tool, the use of markets makes improved outcomes and efficiencies possible, and creates opportunities for innovation. The Government of Alberta acknowledges the continued need to focus on policy integration, cohesion and alignment as well as the importance of ongoing multi-stakeholder involvement.

This Framework is a significant step toward ensuring a sustainable and prosperous future for our province. With the right blend of policies, tools and measures in place, the ecosystem and economic benefits of new products, services and business opportunities can be profound.

# Ecosystem Services

Our world, and the resources and biodiversity it contains, provides many goods and services that are essential for economic prosperity and other aspects of society's well-being. "These 'biological underpinnings' are encompassed in the phrase *ecosystem services*, which refers to a wide range of conditions and processes through which natural ecosystems, and the species that are part of them, help sustain and fulfill human life. These services maintain biodiversity and the production of ecosystem goods, such as seafood, wild game, forage, timber, biomass fuels, natural fibres, and many pharmaceuticals, industrial products, and their precursors. The harvest and trade of these goods represent important and familiar parts of the human economy."<sup>4</sup>

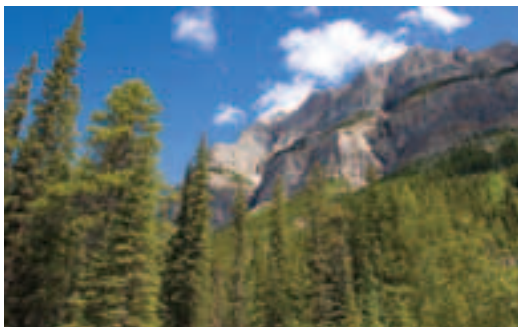
This Framework uses the term "ecosystem services" when describing the benefits that people obtain from the ecosystem. This term is further described in the Millennium Ecosystem Assessment (MEA)<sup>5</sup> and has been adopted internationally to describe the range of goods and services provided by the ecosystem for human benefit.

With the exception of provisioning services (such as food, fibre and fuel) for which markets are established, society greatly undervalues ecosystem services because of the lack of market signals to reflect changes in their supply or condition. Furthermore, few people are aware of the interactive role between ecosystem services that are traded in the marketplace and those that we consider public goods. This lack of awareness helps drive the conversion of non-market ecosystem services (such as wetlands) to human-dominated systems (such as grain fields or urban housing), whose economic value is expressed in standard currency.<sup>6</sup>

4 Daily, G.C., Alexander, S., Ehrlich, P.R., Goulder, L., Lubchenco, J., Matson, P.A., ...Woodwell, G.M. (n.d.) Ecosystem Services Supplied to Human Societies by Natural Ecosystems. Introduction section, para. 2. Online at <http://www.ecology.org/biod/value/EcosystemServices.html>.

5 See Millennium Ecosystem Assessment, online at <http://www.millenniumassessment.org>. The MEA describes four main categories of ecosystem services: supporting, provisioning, regulating and cultural.

6 Daily, G.C., Alexander, S., Ehrlich, P.R., Goulder, L., Lubchenco, J., Matson, P.A., ...Woodwell, G.M. (n.d.) Ecosystem Services Supplied to Human Societies by Natural Ecosystems. Online at <http://www.ecology.org/biod/value/EcosystemServices.html>.







“Command and control” approaches have not succeeded in protecting many ecosystem services, for two main reasons: a) they are generally not dynamic tools and thus are unable to reflect changing outcomes and goals, and b) they require significant attention to compliance activities to ensure success.

An alternative policy approach is to create and develop market mechanisms that integrate the way ecosystem services are used and managed. Viewing ecosystems and the services they provide in this inclusive and integrated manner transforms our ability to focus on and assess priorities and to use the ecosystem services accordingly. It creates an awareness of the trade-offs made between the various ecosystem services provided when land use patterns change, thereby allowing society and land managers to make more informed and profitable choices.

Markets for some ecosystem services are already in place and functioning. Implementing a market approach for other services, such as water quality or quantity, wildlife habitat or biodiversity will expand the options and choices available for profit-seeking businesses.



# Purpose of the Ecosystem Services Market Policy Framework

The policy decision support system described in this Framework brings together and connects the business and environmental outcomes expressed in a range of Government of Alberta policy documents. Implementation of this Framework will:

- Contribute to achieving Alberta's vision, including a high quality of life for our citizens;
- Create opportunities for business innovation, improved competitiveness and investment as environmental compliance aligns with enhanced business efficiency;
- Help Alberta meet its goals for sustainable development and enable industry to go beyond compliance to improve ecosystem performance;
- Direct the Government of Alberta in its policy development so that, where possible, a policy instrument built around a market is used to achieve desired outcomes and legislation is designed to facilitate and support the market, not to tell land managers what they can or cannot do;
- Enable existing policy direction, which is described in the Government's business plan and other policy documents<sup>7</sup> and is being integrated through the regional plans developed under the *Land-use Framework*;
- Protect and improve the capacity of the ecosystem to provide valuable services; and
- Guide the creation of a dynamic, efficient and effective ecosystem services marketplace that adds value for natural resource managers who practice good ecosystem management and document the ecosystem integrity of their products.

<sup>7</sup> Documents in addition to the *Land-use Framework* include, but are not restricted to the *Water for Life* strategy and *Launching Alberta's Energy Future*, the province's energy strategy.



# Critical Assumptions

This policy Framework was guided and informed by the following critical assumptions:

- All Albertans share an ethical responsibility to care for the environment, and have an obligation to protect the land and the ecosystem services it provides.
  - The broad range of ecosystem services provided by nature has value.
  - New economic benefits and value can be derived from public and private natural resources.
  - The market-based approach is innovative and is part of the larger suite of policy tools available to achieve desired ecosystem outcomes.
  - Opportunities for economic growth take into account ecosystem and social outcomes.
  - The Government of Alberta will be responsible and accountable for public assurance of ecosystem protection, including compliance and enforcement, monitoring and public reporting.
- Policy goals and desired ecosystem outcomes will be set by the Government of Alberta through other processes.
  - Marketplace design will
    - Encourage participation, competition, innovation and inclusiveness;
    - Be simple, transparent and accountable; and
    - Recognize and respect the value of pre-existing agreements and allocations.
  - Decisions are made and communicated in a transparent manner.
  - Policy development is aligned, integrated and cohesive.



# Principles

Principles transcend specific goals and are the basis for enduring, consistent action. The Government of Alberta's Strategic Business Plan includes principles that reflect a commitment to sustainability.

Government of Alberta policies and initiatives related to the implementation of this Framework will take direction from the following principles:

- Promote policy instruments that are: performance or outcome-based, verifiable and yield measurable results.
- Acknowledge the costs and benefits of the land-use and resource-use trade-offs associated with ecosystem services.
- Achieve multiple desired outcomes through bundling and integration of ecosystem services on a landscape basis.
- Support and encourage continuous improvement in business performance in the areas of ecosystem services outcomes.
- Ensure that businesses have access to a range of policy instruments, tools and options to facilitate effective participation in the marketplace and that, where possible, all players influencing a specific ecosystem service are incorporated into the market.
- Enable creativity and innovation in systems, processes, research, technology and institutions that add value to Alberta's resource-based industries and the way they enhance ecosystem services, while generating improved economic returns.
- Apply an integrated systems approach to assess and understand the potential implications that policy trade-off choices might have for an ecosystem service or the competitiveness of a sector.



# Building a New Approach to Policy Development

Although market-based tools have been applied in Alberta, the new approach described in this Framework provides policy guidance to facilitate the transition to an innovative and integrated provincial ecosystem services marketplace. This section describes the elements of the new approach.

## Clearly Defined Environmental Objectives

Clearly defined environmental objectives are the basis for determining the best policy approach to achieve the desired environmental and economic outcomes. Ideally, objective-setting processes will be participatory in nature. Although clear objectives are fundamental to the success of the Ecosystem Services Market Policy Framework, setting objectives is outside the scope of the Framework. Alberta has other processes that have developed and continue to develop environmental objectives whose achievement can be aided by the guidance in this Framework; these include the regional plans developed as part of the *Land-use Framework*, objectives in *Water for Life*, and others.

## Understanding the Need for Policy Intervention

The context for potential policy intervention related to an ecosystem service or environmental issue must be clearly understood in order to select the most appropriate policy instrument. This context should include:

- Issue definition, which includes developing goals, objectives and thresholds.
- An assessment of trends to determine the current status and projected future status of the environmental issue or desired change in an ecosystem service, as well as potential development pressures on the ecosystem.
- Identification of the policy or market drivers that are causing ecosystem service indicators to change.
- An assessment of potential economic opportunities associated with management's actions to provide ecosystem services.







- An assessment of how the local or regional community is being affected by an environmental issue and how it is likely to respond to changes brought about by the policy instrument being considered to address the issue. This includes identifying community values and assets and groups that are being affected, as well as assessing the community's resilience to the potential impact of a new ecosystem policy.
- An understanding of the possible policy choices, including costs and benefits, and the implications.
- A determination of the risks associated with a policy change, including who will own, manage and finance the risk.

As demand for ecosystem services increases, there is a growing need for policy to support more effective management of these services. To justify intervention, governments need to be able to assess the advantages and disadvantages of alternative policy and management options. Cost-benefit analysis is one method of doing this. When ecosystem services are quantified and bought and sold in a market, a value is placed on the service that allows it to be appropriately accounted for in the cost-benefit calculation.

## Policy Objectives and Responses

The nature, context and risks to the ecosystem service(s) along with clearly defined objectives will determine which policy response is chosen.<sup>8</sup> Adopting this Framework means that government policy should first consider the use of market-based approaches to achieve environmental outcomes that go beyond simple compliance, resulting in innovation and improved system efficiency.

In some situations, a market may not be the most appropriate policy choice; in such cases, alternative or traditional tools should be used. For example, if rapid and decisive action is needed due to a threat to human health, then command and control is likely to be the most effective approach.

Market-based approaches can be used effectively if both a measurable, tradable unit and the associated management response can be quantified. The following questions should be considered:

- Who are the buyers and who are the sellers and are there enough of them?
- Are there gains to ecosystem service integrity from trade?
- How is the value of the ecosystem service determined?
- How is the willingness-to-exchange expressed?
- How does the marketplace operate to determine price and give integrity to the exchange?
- Are credible measurement, reporting, compliance monitoring and dispute resolution systems in place?

<sup>8</sup> Parts of this section are adapted from Alberta Environment's online tool guide; <http://www.environment.alberta.ca/2020.html>



## Choosing the Right Policy Instrument

The policy options for providing ecosystem services include a variety of instruments that can be categorized according to the approach selected. These approaches along with some of the most relevant instruments are shown in Table 1.

**Table 1 — Examples of Policy Approaches, Types and Instruments for Providing Ecosystem Services**

Approach	Description of Instrument	Examples of Instrument
<b>Market Based</b>	Market creation (quantity-based) instruments establish a property right on a unit basis and that unit is what will be traded or purchased.	<ul style="list-style-type: none"> <li>• Tradable permits or credits</li> <li>• Tradable disturbance rights</li> <li>• Compliance or voluntary offsets</li> </ul>
	Market shifting (price based) instruments influence the market by using a specific mechanism to incorporate the environmental benefit or cost of particular activities.	<ul style="list-style-type: none"> <li>• Environmental taxes</li> <li>• User fees</li> <li>• Payment schemes</li> <li>• Tax credits</li> </ul>
	Market shifting (market friction) instruments remove obstacles to ecosystem service market formation or growth.	<ul style="list-style-type: none"> <li>• Performance based insurance premiums</li> <li>• Performance based or risk management-based interest rates</li> <li>• Consumer information</li> </ul>
<b>Command and Control</b>	So-called “quantity-based” instruments are used to set aside designated land for particular uses.	<ul style="list-style-type: none"> <li>• Land use planning</li> <li>• Protected areas</li> <li>• Conservation directives</li> <li>• Covenants</li> </ul>
	Performance-based instruments provide flexibility in meeting clear environmental objectives.	<ul style="list-style-type: none"> <li>• Management plans</li> <li>• Compulsory best management practices</li> <li>• Licensing</li> </ul>
<b>Supporting Policies</b>	Suasive instruments and voluntary approaches seek to change behaviour in support of achieving an objective by raising awareness and providing information.	<ul style="list-style-type: none"> <li>• Awareness and information programs</li> <li>• Education programs</li> </ul>

Figure 1 illustrates how stakeholders and policy makers can begin to work through the range of issues associated with choosing an appropriate policy instrument. It also reflects the complexity involved in choosing the appropriate instruments for specific local, regional or provincial contexts. Key decision points appear in dark blue boxes and are described in more detail below the figure. Light blue boxes present the results of the decision points. Green boxes note the resulting policy option that should be considered for further assessment. In working through this figure, after each decision point the policy maker should assess the outcome of the resulting policy option chosen against: (i) whether the policy objective has been achieved, and (ii) the performance of the policy option against specific policy evaluation criteria. The range of issues associated with choosing a policy instrument will be context specific. Relying on Figure 1 alone is not sufficient to choose a specific policy instrument.

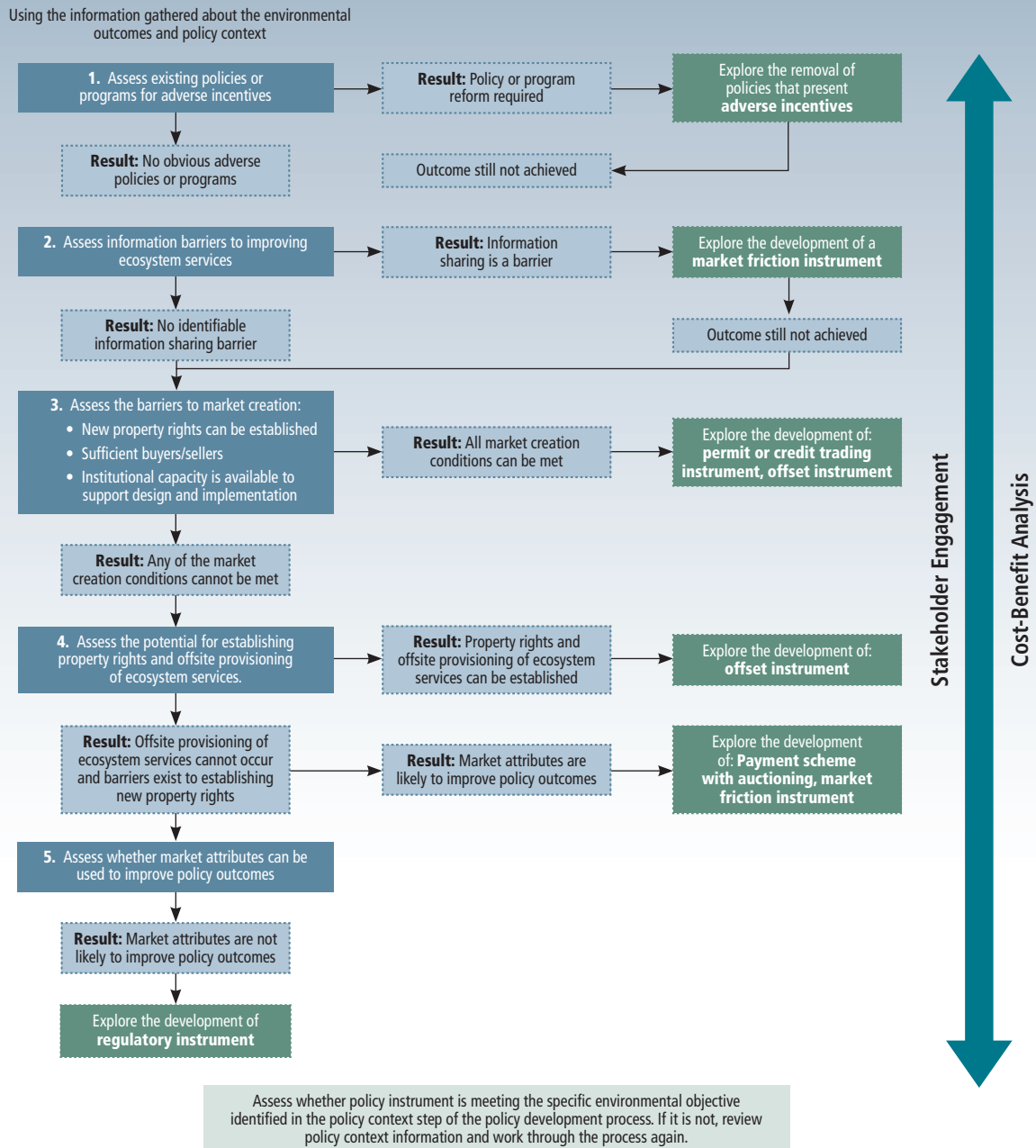
The policy choice framework in Figure 1 focuses on a range of potential market instruments. If the results do not support the use of market instruments, a regulatory instrument could be considered.

Before starting to use the policy choice framework, the environmental outcomes must be clearly defined, and the context within which the particular policy is to be developed and applied needs to be understood. Input and guidance from experts at each step in the policy choice framework is required to ensure that decisions are integrated, grounded and well-informed. The process is intended to be applied using multi-disciplinary expert teams to ensure integration, systems thinking and thorough evaluation of consequences and implications.





### Figure 1 — Policy Choice Framework





### **Step 1: Assess existing policies or programs for adverse incentives.**

A number of policies exist to encourage provisioning services (commodity production). Many of these policies are established for social or economic reasons but they may also be supporting actions that negatively affect the provision of other ecosystem services. If such policies are not removed or reformed before new market-based instruments are introduced, the efficiency of the market-based approach may be compromised.

The following questions should be asked as part of the assessment of current policies and programs and their impact on ecosystem services:

- What actions are causing adverse ecosystem service outcomes?
- Are current policies influencing these actions?
- What is the potential for reforming the policies that support actions that are degrading ecosystem services? Political, social and economic dimensions should be considered when examining the potential for reforming existing policies, and policy makers should undertake this task in an integrated manner.
- Will reforming policies that have an adverse impact on ecosystem services provide the necessary change in behaviour on the land base to move towards the identified environmental outcomes?

Once existing policies and programs have been assessed for adverse incentives, policy makers must decide whether ecosystem service policy goals can be achieved by eliminating or reforming an existing policy. If not, the policy maker should move to Step 2.

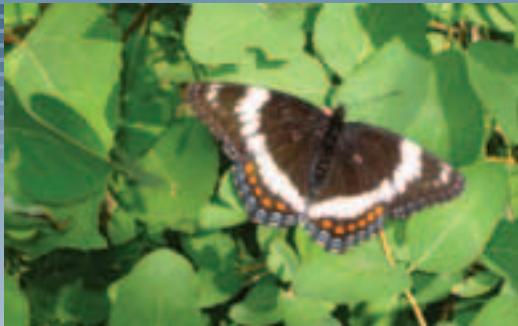
### **Step 2: Assess information barriers to improving ecosystem services**

Information and information sharing play important roles in improving market efficacy, so it is necessary to assess whether alleviating barriers to information sharing can improve the functioning of existing markets. If information barriers can be overcome, this approach can be a more cost-effective solution than developing new policy instruments. Although alleviating information barriers is important, this policy option alone is unlikely to induce enough behavioural change to achieve the desired ecosystem services outcomes.

Information barriers can be reduced through the use of market shifting instruments or education and information programs. For example, information about how a firm is affecting an ecosystem service or how a firm performs relative to its competitors often provides internal motivation for companies to reduce their impact.<sup>9</sup> Further, making this type of information available to the public creates an incentive for those who are having a negative environmental impact to reform. Alleviating information barriers can also enhance the performance of voluntary markets, some of which now exist for ecosystem services in Alberta, by more effectively bringing together buyers and sellers for exchange and promoting the transparency in trade and reporting.

If there are no identifiable information-sharing barriers or if market friction instruments do not bring about the desired outcomes, policy makers should move to Step 3.

<sup>9</sup> Thaler R. & Sunstein, C. (2009). *Nudge*. New Haven, Connecticut: Yale University Press.



### **Step 3: Assess the barriers to market creation.**

To facilitate market creation, a number of pre-conditions should be met, including:

- The environmental outcomes are clearly reflected in public policy development.
- Property rights for the services can be cost-effectively created.
- There are many potential market participants (buyers and sellers) and no one firm has the ability to set market prices.
- The tradable commodity is quantifiable and has a direct link to the desired ecosystem service.
- There is sufficient institutional capacity (that is, organizational skills, culture and administrative capacity) to support the market.
- Government is willing to legitimize a market that transfers liability to those damaging ecosystem services, and transfers benefits to those who improve ecosystem services.

If all market creation conditions can be met, the development of a permit or credit trading instrument or an offset instrument should be explored. If any of the market conditions cannot be met, policy makers should move to step 4.

### **Step 4: Assess the potential for establishing property rights and offsite provisioning of ecosystem services.**

In this step, policy makers should consider whether the ecosystem services objectives can be met by establishing property rights that could be traded to fund and create offsite ecosystem services. This means that property rights would first need to be established for specific ecosystem services in the form of a measurable, tradable unit. This provides an opportunity for the impacts of a development activity in one place to be offset by securing a similar ecosystem service, such as wetlands or habitat, in another location. If this condition can be met, the development of an offset instrument should be explored. If offsite provisioning of ecosystem services cannot occur or barriers exist to establishing new property rights, policy makers should consider Step 5.

### **Step 5: Assess whether market attributes can be used to improve policy outcomes.**

In this step, policy makers should assess the potential to use market attributes to lower transaction costs, introduce additional efficiency to the chosen policy instrument and provide additional incentives or disincentives to produce a given outcome. A range of instruments can be considered at this stage. Price-based instruments such as levies, charges, tax credits or payment schemes are examples. Market friction instruments such as auctions, risk-based insurance schemes and outcome-based support are also potential examples. In reaching this step, policy makers have determined that most other market-based instruments are not appropriate, so exploring the use of the instruments described in step 5 seeks to introduce principles of cost-effectiveness and efficiency to regulation.

# Critical Components for a Successful Market-Based System

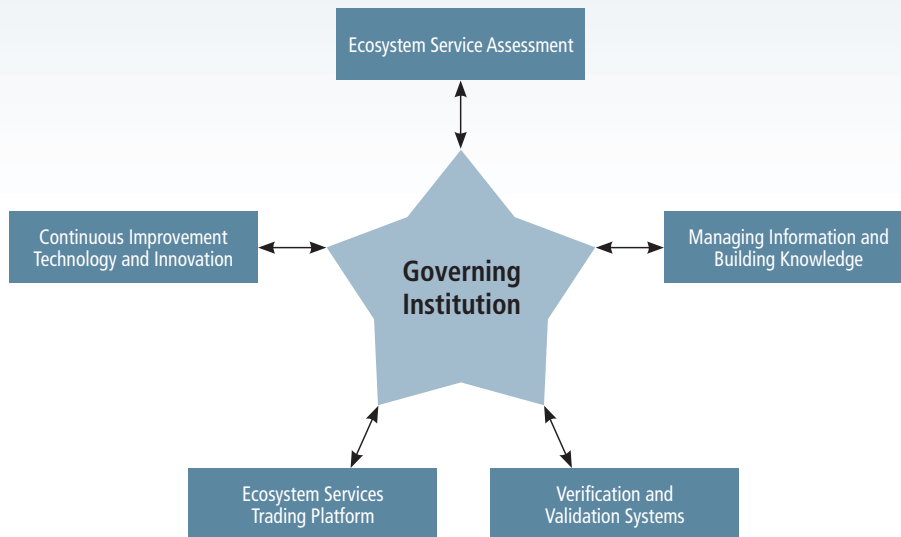
To achieve an efficient and functioning marketplace for ecosystem services a number of critical components must be established to facilitate the following functions and activities:

- Continuous improvement in the management of public, private and common pool resources.
- The coming together of specialists, market actors and policy advisors in a creative and effective environment.
- Development of comprehensive biophysical, community and policy context information.
- Assurance related to tradable units, environmental improvements and cost-effective use of compliance and non-compliance funds.
- Transactions between buyers and sellers.

- Integration of multiple policy instruments to support the achievement of environmental outcomes.
- Advances in the use and effectiveness of existing and future policy instruments.

The key components for a successful market-based system are illustrated in Figure 2. The multi-stakeholder, arm's length body designated as the “governing institution” will manage and coordinate the components of the system and will have other important responsibilities associated with risk management, financing, cost-benefit analysis, stakeholder engagement and creation of effective and collaborative partnerships.

Figure 2 — Critical Components for a Successful Market-Based System





## Ecosystem Service Assessment

An accepted, methodical way of assessing ecosystem services underpins the ecosystem services market system. Assessments are done to identify the ecosystem services available and determine the condition and extent of each of the ecosystem services in Alberta and within a given region.

The ecosystem service assessment, based on sound science, enables the establishment of metrics and currencies to facilitate identification and registration of ecosystem service units. Its focus is to facilitate the following marketplace measurement functions:<sup>10</sup>

- Estimating the quantity and quality of ecosystem service units.
- Identifying and describing the spatial relationship between management actions and ecosystem change in a region and the expected impact on ecosystem services.
- Establishing baselines against which to measure future changes in ecosystem services.
- Assessing the location of ecosystem service outcomes and their relative value to adjacent communities.
- Assessing the timing of ecosystem service outcomes.
- Assessing the risk and certainty of management outcomes based on predicted human and natural factors.
- Enabling the alignment of ecosystem service outcomes to assess the positive and negative impacts for other markets and large-scale ecosystem functions.

This information provides baselines against which future changes can be measured and transactions verified. The assessment system must be integrated across provincial, regional and local scales and must enable prioritization and assignment of a value (or currency) to the particular ecosystem service attached to the area.

## Managing Information and Building Knowledge

Managing information and building knowledge is critical to the development of the ecosystem service marketplace. This component of the marketplace system involves two key functions: a robust information management system and a collaborative knowledge network.

A robust information management system is based on collaboration, cooperation, transparency and data sharing among all stakeholders and partners to achieve high efficiency and effectiveness. A solid foundation of collaboration and cooperation between government, business and communities will change the way solutions are developed for complex environmental issues. Shared participation and collaboration across all resource management sectors will help to bring about a new environmental management paradigm and brand Alberta as an environmental leader. This Framework recognizes the significance of supporting collaboration by ensuring that the institutional infrastructure and tools are in place to promote open innovation and build capacity.

<sup>10</sup> Whitten, S., van Bueren, M., & Collins, D. (2009). "Market-based instruments for ecosystem services in a regional context." Rural Industries Research and Development Corporation, Canberra, Australia.



The main components of the information management system include:

- A spatial ecosystem service inventory.
- An ecosystem service indicator database to provide an understanding of trends in ecosystem services provincially, regionally and sub-regionally.
- An economic valuation database to identify local and regional benefits.

Connected with information management is the need to build a distributed knowledge infrastructure that supports an understanding of the opportunities for ecosystem service markets, data management, policy instrument evaluation and the integrity of marketplace transaction and institutional networks. This infrastructure in turn will promote buy-in and build capacity in personnel, science, research and innovation, and policy analysis management to ensure the functioning of individual instruments and the overall ecosystem service marketplace.

Collecting and sharing information needed to support land-use planning and decision making is critical to success of the ecosystem services market; thus creating an integrated system to ensure decision makers have access to the information they need is fundamental.

## Ecosystem Services Trading Platform

A trading platform to facilitate and register transactions in the marketplace is required. A properly operating provincial platform provides credibility and transparency, is efficient and should yield a starting point for building on and interacting with international market exchange platforms.

The ecosystem service trading platform serves as a central point for buyers and sellers to exchange ecosystem service units. The trading platform will be robust enough to incorporate a range of potential functions including:

- Bilateral trades: where one-on-one negotiations are undertaken through a bargaining process and market participants need only register the traded ecosystem service units.
- Exchanges: a public forum where buyers and sellers can meet and exchange ecosystem service units in a transparent pricing environment.





Along with facilitating transactions, the ecosystem services trading platform will include the management or coordination of the following components:

- **Data inventory:** Ecosystem services baselines need to be calculated for each regulated component and, overall, for an ecosystem. Baselines help identify appropriate ecosystem targets and monitor change.
- **Registry:** A registry acts as an exchange-recording entity and a custodial system for credits. A registry enhances the credibility and transparency of environmental transactions and provides confidence to the marketplace, reducing risk and facilitating lower transaction costs.
- **Common protocols:** Use of internationally accepted ecosystem services accounting methodologies increases the interchangeability of credits and the legitimacy of the program.
- **Determination of initial allocation:** Fair and clearly defined allocation of credits and limits of credits are integral to reducing uncertainty for regulated parties. This forms the basis for initial ownership for ecosystem services as recorded in the registry.
- **Public reporting:** Public reporting encourages transparency and accountability of the trading platform.

## Verification and Validation Systems

With the establishment of a marketplace for ecosystem services, the entity that oversees the marketplace will also need to verify that the exchanges between buyers and sellers are valid and based on sound science. This will mean developing specific protocols to ensure that those who assess the exchanges are proficient and fully understand the metrics involved so that the correct credits are associated with the action. “Correct” in this context includes validation of both quantity and quality of credits.<sup>11</sup>

Documenting ecosystem service outcomes is based on the use of quantitative methods to measure the ecosystem services achieved by applying a particular instrument and verifying that the action directly achieves or connects to the broader ecosystem outcomes. To facilitate global recognition, acceptance and participation, the ecosystem services marketplace will rely on globally recognized third-party verification systems for documenting the integrity of ecosystem service units.

The system provides opportunities for traditional commodity producers to use tools like eco-labelling or branding to tell consumers when a product has met specific environmental standards. A credible, globally recognized validation system will assure Albertans and global consumers that desired ecosystem outcomes and transactions are being achieved and that product claims made in the marketplace are legitimate.

<sup>11</sup> For more information, see the work of the Willamette Partnership, described at <http://www.willamettepartnership.org/>

The intent of the Framework is to build on the good work already done by the Government of Alberta in establishing clear outcomes and baselines with validation protocols built around ecosystem services outcomes. Once a price is placed on ecosystem services and it is possible to verify that the desired ecosystem outcomes are being achieved, companies and resource managers will receive positive or negative price-based feedback on their management practices. This fosters enhanced opportunities for creative and innovative solutions that lead to development and commercialization of new, more sustainable approaches as businesses seek to improve their economic prospects.

### **Continuous Improvement**

Continuous improvement is essential to effective policy development and application and to making the ecosystem services market system better. Responding to changing economic conditions and societal preferences is a reality for all complex economies, but such challenges can lead to innovative solutions. As Alberta becomes more experienced with market-based instruments, properly formulated systems that support the marketplace will be able to respond and adapt to allow for continuous improvement in approaches, components, the system as a whole, and environmental and economic outcomes.

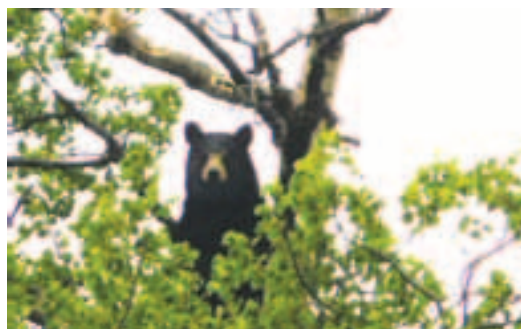


Regular policy management is a necessary component of good governance; it enables decision makers to determine if the policy is doing what it was intended to do and if it fulfills its public assurance duty.

A thorough evaluation of the proposed market-based approach for ecosystem services would determine if:

- The policy is achieving the desired environmental outcomes;
- The market-based approach is more efficient and effective than command and control;
- The market, the outcomes and the costs align with international standards and approaches;
- The policy is providing sufficient flexibility for business performance to go beyond compliance and be rewarded for this action;
- There are any unintended impacts of the policy on business competitiveness; and
- There are opportunities for adjustments and adaptive management in the face of unexpected outcomes, and for innovative solutions.

Evaluation would recommend if improvements to the overall market based approach are needed.





# Governance Model

A good governance structure with clear delineation of decision making and of the roles and responsibilities of government, business and other stakeholders is critical to the success of a market-based approach for providing ecosystem services.

Governance refers to the process of making decisions and the process by which decisions are implemented. Among other things, good governance is participatory, accountable, transparent, responsive, effective and efficient, equitable and inclusive, and follows the rule of law. It is reasonable to expect that the policy direction envisioned in this Framework would have the characteristics of good governance. With a market-based policy approach, the Government of Alberta will continue to be responsible and accountable for the public assurance component of ecosystem management, including compliance with and monitoring of outcomes.

The Government of Alberta recognizes that “Individuals, communities, industry, municipalities and non-profit organizations all have an important role to play in achieving our vision for Alberta.”<sup>12</sup> These roles, as they pertain to ecosystem services markets, should be clearly described and communicated. Opportunities for timely stakeholder engagement also need to be provided at key decision points while markets and potential market instruments are being considered, developed and evaluated.

At a minimum, there will be specific governance roles for buyers and sellers of ecosystem services, for the marketplace regulator, and for government in ensuring market and policy efficiency and effectiveness. Implementing the Framework is best achieved through an independent, multi-stakeholder

body, acting in the public interest, to coordinate and to provide oversight and executive management functions to support the market. This body would be accountable to the Government of Alberta, which is responsible for public assurance related to the province’s natural resources, and would report to the Government and to Albertans on a regular basis.

Governance of a functioning marketplace must be supported by:

- Coordination and management of the components to ensure a functioning market system;
- Undertaking of appropriate evaluation and analysis of costs and benefits to help inform decision making;
- Adopting risk management and mitigation strategies;
- Stakeholder engagement and partnership development;
- Creation and maintenance of distributed networks;
- Capacity building;
- Communications and reporting activities; and
- Financing and funding of the market structure.

A strong governance structure built on a foundation of innovative institutions, processes and systems is essential for effective functioning of a credible marketplace. Such a structure will have all the attributes described above for good governance, but will also encourage and support creativity in solving problems and identifying new opportunities. It will recognize the value of existing institutions and processes and will build on or improve them where necessary.

<sup>12</sup> Government of Alberta. (2009). *Budget 2009: Government of Alberta Strategic Business Plan*. p. 1. Online at <http://www.finance.alberta.ca/publications/budget/budget2009/govbp.pdf>.

# Conclusion

Effective application of the Ecosystem Services Market Policy Framework will be a significant step toward enabling a sustainable and prosperous future for Alberta. Implemented with the right blend of policies, tools and measures, it will facilitate the achievement of desired ecosystem outcomes and promote economic benefits through innovative new products and business opportunities. Its adoption stands to position Alberta as a recognized world leader in the development and application of innovative systems and institutions that integrate ecosystem and business planning and management through market-based policy.

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