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Supplementary Materials for Report on

Future Expectations of Corporate Environmental Performance

Emerging Ecosystem Services Applications and Tools

BSR's Environmental Services, Tools & Markets Working Group

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About this Report

These supplementary materials were written by Sissel Waage, Kit Armstrong, and Linda Hwang with support from the following corporate members of BSR's Environmental Services, Tools and Markets Working Group: BC Hydro; BG Group; BP; Chevron Corporation; Eni; E. I. du Pont de Nemours and Company; Exxon Mobil Corporation; Freeport McMoRan Copper & Gold Inc.; Rio Tinto, and Shell.

The document is based on a literature review as well as discussions with, and presentations from, thought leaders in the ecosystem services field, who are listed in Annex 1 of the main report. Any errors in the report are those of the authors alone.

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Table 1. Corporate Governance Activities & Potential Ecosystem Services Tool Interface Points

Illustrative Governance Activities	Potential Interface Points with Ecosystem Services	Types of Tools Needed & Tool Application Potential	Tool Attributes Desired for Corporate Governance Applications
Policy and processes which provide a framework for action and setting performance criteria and indicators	» Commits company to address ecosystem service-related considerations in business operations directly or indirectly	Tools specifically designed to: » Help a company assess corporate level risks, liabilities and opportunities (economic, practical, reputational) around ecosystem services generally » Support business case to consider and address ecosystem services, including specific indicators for corporate-level evaluation	» Clear ecosystem services indicators for policy development » Specific ecosystem services parameters that could be added to existing corporate processes/procedures (e.g. impact assessment, risk management, carbon management)
Performance criteria and indicators which includes quantitative/qualitative goals, objectives, targets, and metrics	» Commit company to track specific aspects of corporate performance relating to ecosystem services	Tools that explicitly identify: » Performance criteria and indicators needed for evaluation » Key indicators associated with measuring ecosystem services and their dynamics	» Lists of indicators that can be aggregated above the site level and across the organization, for corporate-wide management
Performance reporting and communication— both internal and external—related to a company's environmental and/or social performance	» Inclusion of ecosystem services parameters in corporate reporting	» Limited potential for tool use except through other governance activities, especially policy and performance criteria/indicators	» Lists of indicators that can be aggregated above the site level and across the organization, for corporate-wide management
Annual planning which provides a regular interval for reviewing the goals, policies, and processes that shape business strategy and operations	» Opportunity to identify need for specific new goals, objectives, and performance targets related to ecosystem services, and provide resources for action through annual budgets	» Limited potential for tool use except through other governance activities discussed above	» Limited potential for tool use, except through other governance activities and key indicators discussed above

Table 2. Corporate Strategy & Potential Ecosystem Services Tool Interface Points

Illustrative Strategy Activities	Potential Interface Points with Ecosystem Services	Types of Tools Needed & Tool Application Potential	Tool Attributes Desired for Corporate Strategy Applications
Mergers & Acquisitions including corporate-level acquisition of, merger with, or divestiture of a company having assets beyond a single facility or operational site	Potential to highlight ecosystem services factors to consider in: » **Negotiating merger and acquisition deals** (e.g. where ecosystem services issues could significantly affect the value of the deal or ability to complete it » **Prioritizing or selecting between new deal opportunities** (e.g., higher priority for least impact on relevant ecosystem services) » **Guiding strategic development approach** (e.g., consideration of whether to put in a single large facility in one location with concentrated impacts, or multiple smaller facilities spread out over multiple parcels)	» Tools that help a company conduct rapid, high-level assessments and valuations of a business and/or property around significant ecosystem services liabilities / risks and benefits / opportunities *Note: This tool application will typically be incorporated into a broader, high-level company strategic environmental and social risk/opportunity assessment process to inform a business decision*	» Spatially explicit information at an appropriate scale » Capability to deal with situations: o requiring rapid, high-level comparison and prioritization of ecosystem services parameters on multiple properties in differing locations o needing identification of any “game changing” or “no go” ecosystem services issues associated with the business opportunity o where the company has access to very limited data about another company and/or properties being evaluated
Asset portfolio review, in order to prioritize assets, particularly properties for retention or sale, identify best uses for different landholdings, evaluate ecological assets, etc.	» **Identifying desired or sustainable uses of a property** (e.g., uses that will maximize benefit/value from ecosystem services, give rise to fewest potential future liabilities, etc.) » **Prioritizing among properties** for sale or retention » **Leveraging greatest value for relevant ecosystem services associated with the property** (e.g., to attract maximum number of potential buyers or set most attractive sales price)	» Help company conduct assessments of multiple properties around significant ecosystem services liabilities / risks and benefits / opportunities	» Spatially explicit information at an appropriate scale

Table 3. Corporate Operations & Potential Ecosystem Services Tool Interface Points

Illustrative Operational Components	Potential Interface Points with Ecosystem Services	Types of Tools Needed & Tool Application Potential	Tool Attributes Desired
Ongoing management of activities and facilities	» Complying with current or future regulatory requirements » Exploring impact mitigation (e.g. on ecosystem services used by operations or local communities) » Identifying and managing key operational dependencies on ecosystem services and external threats » Providing new operational value (e.g. mitigation banking for permit credits or revenue) » Maintaining or improving operational efficiency » Management supply chain for long-term stability (e.g., with contractors, suppliers, customers, etc.) » Engaging in operational planning and assessment of impacts and opportunities, including around eventual asset retirement	Tools that will: » Support ongoing implementation of monitoring, mitigation, enhancement, and other measures in ESHIA Management Plans » Identify alternative approaches to compliance with regulatory requirements based on ecosystem services considerations » Contribute to periodic environmental and social risk assessments for the operations (e.g., to identify ES-related impacts, risks, dependencies, vulnerabilities, etc.) » Identify operational approaches and practices (e.g. to avoid/manage impacts, maximize operational benefits/positive effects, avoid/minimize potential future costs or liabilities associated with end of operations and asset retirement) » Establish/adapt site-specific indicators, targets, etc. for monitoring and measuring operational impacts and management approaches relating to ES » Identify and manage operational efficiency and supply chain issues	» Tools adaptable and effective for use in a wide diversity of operational activities, locations, environmental , social and economic contexts
Life cycle evaluation and management of new	Anywhere along the product, technology or service lifecycle where activities could have	Tools that integrate easily with pre-existing:	» Tools adaptable and effective for use in a wide diversity of

technology, product and service, such as "Cradle to Grave" assessment and management of risks, impacts, opportunities and benefits from development of a new product, technology and service	direct or indirect effects on ecosystem services, such as: » Competition for a crop to become biofuel vs. food use » Toxic waste or emissions from new ore processing technology » Risks to fish from new dam intake design » Water pollution from transportation or storage of new vehicle fuel » Capability for a new chemical or equipment for a new technology to be recycled, reused or disposed of without negative ecosystem service impacts	» High level risk/opportunity assessment approaches relating to decisions whether to invest in a potential new product, technology or service » Situation-specific assessments of implications of activities/decisions throughout the product, technology or service lifecycle, (e.g. design, manufacture, distribution; company, customer or 3rd party use; end-state management through recycle, reuse or disposal)	operational activities, locations, environmental , social and economic contexts
Asset Retirement at end of operational life - to prepare site for conversion to actual / potential alternative uses, and for long-term retention and management or for transfer (e.g. sale, concession/license relinquishment), such as: » Decommissioning/removal of physical facilities » Site rehabilitation » Documentation of environmental baseline conditions *[Note: end-of-life planning and management often begins as early as initial project planning and continues through operational life of asset.]*	Factoring ecosystem services into assessment of options related to: » Physical asset retirement activities (e.g.facility dismantling, road/utility removal, re-contouring of land, site clean-up, etc.) » Potential future uses of property » Value or liability associated with property retention or sale/transfer	Tools that: » Assist with ecosystem service identification, condition/vulnerability assessment and valuation » Help assess/compare ecosystem services-related impacts and benefits associated with different potential choices of clean-up, rehabilitation and restoration approaches/activities (e.g. environmental and social cost-benefit evaluations associated with site remediation under RCRA, Superfund, NRDA, etc.)	Tools adaptable and useful in a wide range of asset retirement activities

Table 4. New Projects & Ecosystem Services Details

Note:
Tools will likely be used within Environmental, Social and Health Impact Assessment Process (ESHIA) activities, including activities such as: (1) scoping (including key focus issues and project area of influence for assessment); (2) stakeholder engagement; (3) baseline information collection; (4) project description, including alternatives identification, evaluation and selection; (5) adverse impact identification, significance evaluation, and prioritization for mitigation, (6) positive impacts/benefits opportunities identification, and (7) development of impact mitigation, benefit enhancement and monitoring measures

Illustrative New Project Components	Potential Interface Points with Ecosystem Services	Types of Tools Needed & Tool Application Potential	Tool Attributes Desired For New Corporate Projects Applications
Identify & evaluate new projects potential issues/risks that could affect project viability and success (in terms of economics, stakeholder acceptance, company reputation, etc.)	New project: » Issue / risk assessment process » Final decision-making process	Early, high-level identification and assessment of key ecosystem services: » on which the project is likely to depend » that could be significantly affected (positively or negatively) if project goes forward » that are likely to be of major interest to important stakeholders groups (especially local communities) relevant to the project	Capability to deliver geographic-specific information about ecosystem services risks/opportunities appropriate for high-level identification and screening decisions, especially project viability and “go/no go” decisions
Select new projects such as » Assessing alternative potential locations » Selecting among technology options » Determining design parameters or even specifications	Identifying: » Existing ecosystem services in the project’s area of influence (including: where they are located, who thinks they are valuable, and why) » Project dependencies on specific ecosystem services » Project and operational impacts on ecosystem (positive/negative)	Detailed, spatially explicit tools to: » Inform identification of project boundaries for assessment, based on relevant ecosystem service considerations » Identify and prioritize ecosystem services in the project area of influence » Assess potential project impacts and benefit opportunities on those services, including scenarios for impacts/benefits under different conditions (e.g. of project operation, external ecosystem change) » Identify available options to avoid/minimize significant adverse effects and/or maximize potential positive effects » Identify and assess tradeoffs among options » Identify potential ecosystem service enhancement and positive value opportunities	Capability to: » Generate scenarios indicating how ecosystem services are likely to change with or without project activities » Identify relevant ecosystem service values

Define such as: » Detailed engineering design » Major procurement of materials and services	Identifying: » What potentially important services are provided in the project's area of influence, where they are located, who thinks they are valuable and why » How those services will potentially be affected (positively/negatively) by project activities » What options might be available to avoid/minimize significant adverse effects and/or maximize potential positive effects » If / what supply chain concerns exist related to ecosystem services (from contractors or suppliers)	Detailed, spatially explicit tools to: » Identify and prioritize ecosystem services in the project area of influence » Assess potential project impacts and benefit opportunities on ecosystem services, including scenarios for impacts/benefits under different conditions (e.g. of project operation, external ecosystem change) » Identify and evaluate available options to avoid/minimize significant adverse effects and/or maximize potential positive effects, including tradeoffs among options » Identify criteria and measures for long-term ecosystem service monitoring and management » Engage with supply chain on identifying and addressing ecosystem services (contractors/suppliers)	Capability to: » Generate scenarios indicating how ecosystem services are likely to change with or without project activities » Identify relevant ecosystem service values
Execute , such as: » Site preparation » Equipment mobilization » Facility construction and commisisoning	Identifying impacts of execution activities on ecosystem services through building new parameters into existing activities such as: monitoring and management, as well as adjustment of mitigation measures if needed	» Monitor and assess impact mitigation » Support implementation of any ecosystem services enhancement opportunities	» Capability to generate clear and easy to interpret outputs on ecosystem services changes and trends over time