...t Reuse

1. Business Solution	
Short description	Alcoa has various reuses for a byproduct of its alumina refining process, bauxite residue, including wastewater treatment and soil reclamation
Type	• Material reuse, water reduction, ecosystem services

2. Meeting Criteria		
Scalable	**Measurable**	**Additional**
✓ *Bauxite is a byproduct from one of Alcoa's primary business activities; other companies could apply the same principles to their by-products that are otherwise of no value*	✓ *Diminished landfill use*	✓ *Displaces virgin material that would have been produced*

3. Business Action & Commitment	
Mode of Implementation	• Alcoa scientists investigated uses of the bauxite residue • In the soil reclamation case, they tested the efficacy of bauxite to revegetate land affected by acid mine runoff • In the wastewater case, researchers developed a system which allows bauxite to treat wastewater
Scope of Implementation	• Soil reclamation: pilot project is demonstrating the possibility of use in mines across Pennsylvania • Wastewater: The bauxite treats 100% of the wastewater every day at Alcoa's Technical Center *(the largest light metals research facility in the world);* • Alcoa is planning to implement the system at its worldwide facilities
Business Commitment to Action	Relevant global strategic sustainability goals: • to recycle or reuse 75% of landfilled waste by 2020 and 100% by 2030 from a 2005 baseline; • to recycle or reuse 15% of residue generated by 2020; 30% by 2030; • from a 2005 baseline, 15% reduction in bauxite residue land requirements per unit of alumina produced by

	2020; 30% by 2030
Policy & Institutional Requirements	• Beneficial use designation of bauxite residue • Wastewater treatment regulations • Mining lands reclamation regulations
Financing & Investment	• More cost effective than traditional methods of reclamation • Byproduct that would have been waste generates revenue instead • New wastewater system reduced operating costs by 40%, also reduced capital costs
Partnership & Collaboration	• Pennsylvania Department of Environmental Protection
Other enablers	
5. Metrics & Impact Assessment	
Initial metrics identification	• Soil and wastewater: Cost efficacy of by-product use
Impact measurement	• Productivity of soil after reclamation • Avoided waste • Wastewater: 40% energy use reduction compared to conventional technology
6. Other	
Interdependencies	
More information	http://www.alcoa.com/sustainability/en/case_studies/2010_USA_mather_mine.asp?initCountry=26&initYear=1000&initCategory=2 http://www.alcoa.com/sustainability/en/case_studies/2011_innovative_wts_reduces_reuses.asp?initCountry=26&initYear=1000&initCategory=2 http://www.alcoa.com/sustainability/en/info_page/resources_emissions.asp#landfilled

Google's Use of Municipal Waste Water for Data Center Cooling

Short description	Google uses 100% recycled water in the cooling towers of its Atlanta Data Center in Douglas County, GA. This water is provided through an arrangement with the county water and sewer authority. Google built a sidestream plant that intercepts 30% of effluent from the county's primary sewage treatment plant. Following additional treatment, this effluent is used in the data center's cooling towers. Water that does not evaporate is treated and released to the Chattahoochee River. Using recycled water reduces stress on potable sources, expands the capacity of the municipal sewage plant, and releases cleaner water to the environment.
Type	• Water use efficiency

2. Meeting Criteria

Scalable	Measurable	Additional
✓ *Water is inherently a local issue; on this scale, many opportunities exist for using recycled water for cooling needs*	✓ *Water use is measurable within the company, but also by uptake across industries*	✓ *Cooling towers use significant amounts of potable water; recognizing this inefficiency and switching to non-potable and recycled options is crucial*

3. Business Action & Commitment

Mode of Implementation	• Could be done by any company in any sector with cooling needs, although location (in regards to municipal sewer systems) and cost may limit implementation
Scope of Implementation	• Part of ongoing effort to increase water and energy efficiency at data centers. Similar efforts include pulling water from an industrial canal in Belgium and using sea water in Finland
Business Commitment to Action	• Google Green focuses on reducing Google's environmental impact • Data centers use 50% less energy than typical data centers • Google publishes efficiency data for all data centers each quarter

	• All US and European data centers have received voluntary ISO 140001 and OHSAS 18001 certifications
4. Enablers & Barriers	
Institutional Requirements	gnition of the true cost of potable water resources • Location and relationship with local sewer authority
Financing & Investment	• Financed by Google
Partnership & Collaboration	• Douglasville-Douglas County Water & Sewer Authority
Other enablers	• Public relations – good for Google's image • Drought prone location
5. Metrics & Impact Assessment	
Initial metrics identification	• *Cost-benefit analysis: comparable to using potable water*
Impact measurement	• *Water withdrawals reduction* • *Treated water returned to Chattahoochee* • *Increased capacity at public sewer treatment plant*
6. Other	
Interdependencies	This example also addresses energy efficiency issues and ecosystem protection
More information	*http://www.google.com/green/efficiency/datacenters/*

Hitachi's Corporate Ecosystem Valuation Study

Short description	Hitachi studied the financial and societal outcomes of conventional and "precision" agricultural production on hypothetical farms in the US. The GeoMationFarm software is an agricultural information management system that can be used to closely track agricultural inputs and outputs. GeoMationFarm is a GIS that can be used to improve the efficiency of resource use. The study examined corn, wheat, and soybeans, tracking inputs such as water, fertilizer, and pesticides. Hitachi measured outcomes using Corporate Ecosystem Valuation methodology, quantifying the monetary value of scenarios with and without GeoMationFarm technology. Results showed higher financial returns and greater benefits to society with the use of GeoMationFarm.
Type	• Water resource sensors and monitoring, ecosystem protection

2. Meeting Criteria

Scalable	Measurable	Additional
✓ *GeoMationFarm could be used as part of any agricultural production; Corporate Ecosystem Valuation methods can be applied more broadly*	✓ *Resource efficiency may be measurable immediately (i.e. reduced water usage), although quantifying longer-term impacts may be more difficult*	~ *Using information technology to map resource use is no longer a new idea; impacts of this specific software are limited to agricultural land*

3. Business Action & Commitment

Mode of Implementation	• Corporate Ecosystem Valuation methods can be used in many scenarios involving resource management • GeoMationFarm is a software product that could be used by corporations to better monitor the inputs and outputs of agricultural resources within the company or across the value chain
Scope of Implementation	• GeoMationFarm is a Hitachi product that is already in use at more than 40 sites in Japan
Business	• GeoMationFarm is part of Hitachi's "Environmental Vision 2025," which aims to use Hitachi products and

Commitment to Action	services to reduce annual CO2 emissions by 100 million tons by 2025 Hitachi has undertaken additional Corporate Ecosystem Valuation studies internationally to better quantify long benefits of efficient resource management
4. Enablers of Scale	
Policy & Institutional Requirements	• Growing recognition of true cost of water and other resources • Nutrient runoff limitations, either via regulations or voluntary markets
Financing & Investment	• Hitachi product, developed and funded by the company
Partnership & Collaboration	• ERM • Sustain Value
Other enablers	• Education and outreach about true cost of water and other resources
5. Metrics & Impact Assessment	
Initial metrics identification	• Efficiency gains via more effective resource management • Cost-benefit analysis
Impact measurement	• Water usage reduction • Public benefit valuation
6. Other	
Interdependencies	*This example also addresses ecosystem service issues*
Remarks	*More detailed information here:* http://www.hitachi.com/environment/showcase/solution/it/geomation.html http://www.hitachi.com/rev/archive/2009/__icsFiles/afieldfile/2009/12/07/r2009_06_106.pdf

MillerCoors "Water Blueprint"

Short description	MillerCoors conducted a "water blueprint" of all their operations, which showed that more than 90% of water use occurred in the agricultural part of the supply chain. This helped the company to focus its resources on water reduction in this sector. Reducing water needs can help reduce associated risks to the agricultural inputs MillerCoors relies upon. Working with The Nature Conservancy, MillerCoors started a precision irrigation project in Silver Creek Valley, Idaho, the source of much of the beer industry's barley. The project aims to reduce water usage while maintaining yields. Best practices in water conservation are demonstrated at a "Showcase Barley Farm" to encourage adoption by other farmers.
Type	• Water use efficiency

2. Meeting Criteria

Scalable	Measurable	Additional
✓ *Although specific water issues are local concerns, analyzing an entire supply chain can help identify "hot spots" of water usage risk*	✓ *Water use is measurable within the company and supply chain, and also across industries*	✓ *Comprehensive water blueprints show that long term operating sustainability may require companies to look beyond their own activities to their supply chains*

3. Business Action & Commitment

Mode of Implementation	• Could be used by any corporation with a significant supply chain, especially those that rely on agricultural products • Requires corporate support for an analysis of water usage across their entire operations
Scope of Implementation	• Entire operation and supply chain of MillersCoors
Business	• MillerCoors has a five-part water stewardship strategy, addressing water usage, wastewater, water footprinting,

Commitment to Action	watershed assessments, and community partnerships • t companies SABMiller plc and Molson Coors agreed to uphold the UN Global Compact's CEO Water ate • MillerCoors developed a "Sustainability Assessment Matrix" to track annual progress in water, energy and carbon, and packaging and waste
4. Enablers of Scale	
Policy & Institutional Requirements	• Increasing awareness of risk associated with heavy water usage requirements • Public perception of high water users
Financing & Investment	• Funded by MilllerCoors • Concern focused on supply chain risk management
Partnership & Collaboration	• The Nature Conservancy • Farmers and communities within the area of interest
Other enablers	• Public perception of high volume water users • Increasing droughts resulting from climate change
5. Metrics & Impact Assessment	
Initial metrics identification	• Water used to produce barley • Cost-benefit analysis
Impact measurement	• Risk reduction
6. Other	
Interdependencies	This example also addresses improvements in agricultural production and land use efficiency
More information	http://www.millercoors.com/Supply-Chain/Sustainable-Agriculture/Better-Barley.aspx

Rio Tinto's Resolution Copper Project

Short description	Rio Tinto's new Resolution Copper mine is engaged in two water management solutions. 1) An old mine contained about 2 billion gallons of water that had to be removed; an arrangement with the New Magma Irrigation and Drainage District (NMIDD) allows that water to be treated and diverted to the NMIDD, where it is combined with Central Arizona Project (CAP) water and used to irrigate approximately 5,000 acres of agricultural land. This reduces stresses on the region's groundwater resources. 2) To manage the new mine's water risk going forward, Resolution Copper has purchased and banked enough excess CAP water to meet about half of the new mine's future water needs. Rio Tinto expects to purchase enough water to cover the entire mine life before production begins. While banked water is not guaranteed, this arrangement does significantly reduce the water risk associated with the operation of Resolution Copper.
Type	• Water efficiency

2. Meeting Criteria

Scalable	Measurable	Additional
✓ *The specifics of this arrangement are limited in geographic scale; however, similar arrangements could be replicated in other water-scarce areas*	~ *The volume of water recycled is measurable; other environmental costs and benefits are more difficult*	~ *While this arrangement is an interesting business solution, it does not represent a long-term solution to sustainable water use in mining operations*

3. Business Action & Commitment

Mode of Implementation	• Arrangement with regional water services agencies

Scope of Implementation	• Project and area-specific, but could be used in other high water use industries
Commitment to Action	into corporate water strategy incorporates both environmental and economic value of water • Sets five-year efficiency water efficiency targets; from 2003-2008, the goal was a 10% reduction • Conducts "water risk review" for operation sites; 40 out of 110 sites have been assessed so far
4. Enablers of Scale	
Policy & Institutional Requirements	• Recognition of long-term aspects of water resources • Willing regional water service agencies • Regional water banking system
Financing & Investment	• Rio Tinto measures economic value of water resources • "Banked" water is purchased and stored for future use when the system has excess water
Partnership & Collaboration	• New Magma Irrigation and Drainage District • Central Arizona Project
Other enablers	• Water shortages (due to seasonal fluctuations or extreme drought) that emphasize risks
5. Metrics & Impact Assessment	
Initial metrics identification	• Economic savings from reduced water risk • Cost-benefit analysis
Impact measurement	• Recycled water usage • Water use reduction
6. Other	
Interdependencies	
More information	http://www.riotinto.com/documents/ReportsPublications/RTandWater.pdf (Page 26) http://www.azwaterbank.gov/

Yarra Valley Water Utility's Calculation of the True Value of Water Costs

Short description	Yarra Valley Water worked with Trucost to calculate the true environmental costs of water. This allowed Yarra Valley to better allocate its own water resources. Trucost estimates that one cubic meter of water cost between $0.10 and $15, depending on scarcity. Businesses can use the true cost of water when evaluating potential investments via NPV. This can help mitigate water supply risks (such as drought in the western US) as well as improve alignment with environmental goals. Water valuation can also be used to improve supply chain sources, by identifying water-related risks. Water valuation helps companies to differentiate between high water usage and high water risk – not always the same thing.
Type	• True value pricing for water

2. Meeting Criteria

Scalable	Measurable	Additional
✓ *True value pricing could be applied at a range of scales, from individual projects to supply chains and across industries*	~ *True value of water is an obvious measure; but measuring the adoption of this solution by companies would require surveys or case studies*	✓ *Incorporating the true cost of water into business decision-making could result in significant changes in corporate strategy*

3. Business Action & Commitment

Mode of Implementation	• The utility forced a higher cost of water on its customers to reflect real costs • Any company in any sector could impose an internal "true cost" of water, particularly those companies with operations or supply chains in areas of moderate to high water risk
Scope of Implementation	• Yarra Valley applied this to utility operations in Australia, but could be implemented in any country/location
Business Commitment to	• Yarra Valley has a stated commitment to innovative water sustainability through increased water efficiency, as well as management of excessive nutrients and greenhouse gas emissions

Action	• Commitment to supplying recycled water to 100,000 homes in service area • [illegible]erships with developers to integrate innovative water services in new construction
4. Enablers	
Policy & Institutional Requirements	• Regulatory permission to raise water prices for consumers • Encouragement of innovation in water services, despite perceptions of risk • Support in calculating true value price across different locations
Financing & Investment	• Willingness to price a resource (water) above its perceived market value when making internal decisions • Support for third party organizations that are seeking to calculate true value cost of water
Partnership & Collaboration	• Trucost
Other enablers	• Water shortages (due to seasonal fluctuations or extreme drought) that emphasize risks
5. Metrics & Impact Assessment	
Initial metrics identification	• Cost comparison of different projects that incorporate water resources
Impact measurement	• Adoption by companies in decision-making • Public benefit valuation
6. Other	
Interdependencies	This example also addresses ecosystem services issues
More information	http://www.trucost.com/blog/111/the-true-cost-of-water