

Life-Cycle Impact Declarations

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Bill's background

- Independent environmental consultant
- Chief of Environmental Services
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Western Area Power Administration

Hydropower

- Labeled a black technology
- Generation restrictions for environment
- Narrow performance evaluations
- No consideration of power grid effects




Types of Performance Labels

- Type I - Multi-Attribute
- Type II - Single-Attribute
- Type III - Life-Cycle Impact Assessment

Types I and II Approach

- Include technology biases
- Not ground-truthed to confirm actually reducing environmental impacts
- Not necessarily clear about trade-offs
- Stifle innovation
- Don't create a path for continuous improvement
- Include opaque value judgments

Type III Life-Cycle

- Science-based performance assessments
 - Technology neutral
 - Quantify all relevant impacts
 - Consider systemic effects
 - Allow for comparison among options
 - Encourage performance improvements
 - International recognition
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Global Standardization of LCA Practices and Metrics

2000 ISO 14044 Life-Cycle Framework

**2009 SCS-002 LCA Draft Metric Standard
(ANSI)**

- SCS 002-1 Climate Registries
- SCS 002-2 EPP Procurement Network
- SCS 002-3 Building Declarations
- SCS 002-4 EPP Product Certification

2009 EU LCA Metric Standards

Definition of Environmentally Preferable Products

“Products that have a lesser or reduced impact levels on human health and the environment when compared with standard products that serve the same purpose”

(Executive Order 13101)



SCS-002 Standards Committee

- US Department of Energy
- US EPA
- California Department of General Services
- California Integrated Waste Management Board
- Pacific Gas & Electric
- US Steel Industry
- City of San Francisco
- Collaborative for High Performance Schools (CHPS)
- Resilient Flooring Association
- BIFMA
- Armstrong World Industries
- HNI Corporation
- Shaw Industries, Inc.
- SCS
- Berkeley Analytical Associates, LLC

Specific Issues Impact Groups & Category Indicators

Natural Resource Depletion

Non-Renewable Feedstock Resources

Bio-Based Resources

Water Resources

Strategic Metals Resources

Landscape Destruction

Terrestrial Habitats

Aquatic (River) Habitats

Aquatic (Lake) Habitats

Riparian/Wetland Habitats

Loss of Key Species

Global/Regional Chemical Emission Levels

Acidification (Oceanic)

Acidification (Regional)

Stratospheric Ozone Depletion

Ecotoxicity

Eutrophication

Neurotoxicity

Human Health Chemical Exposure Levels

Ground Level Ozone

PM 2.5

Pulmonary Hazardous Chemicals

Ingestion Hazardous Chemicals

Indoor Inhalation Hazardous Chemicals

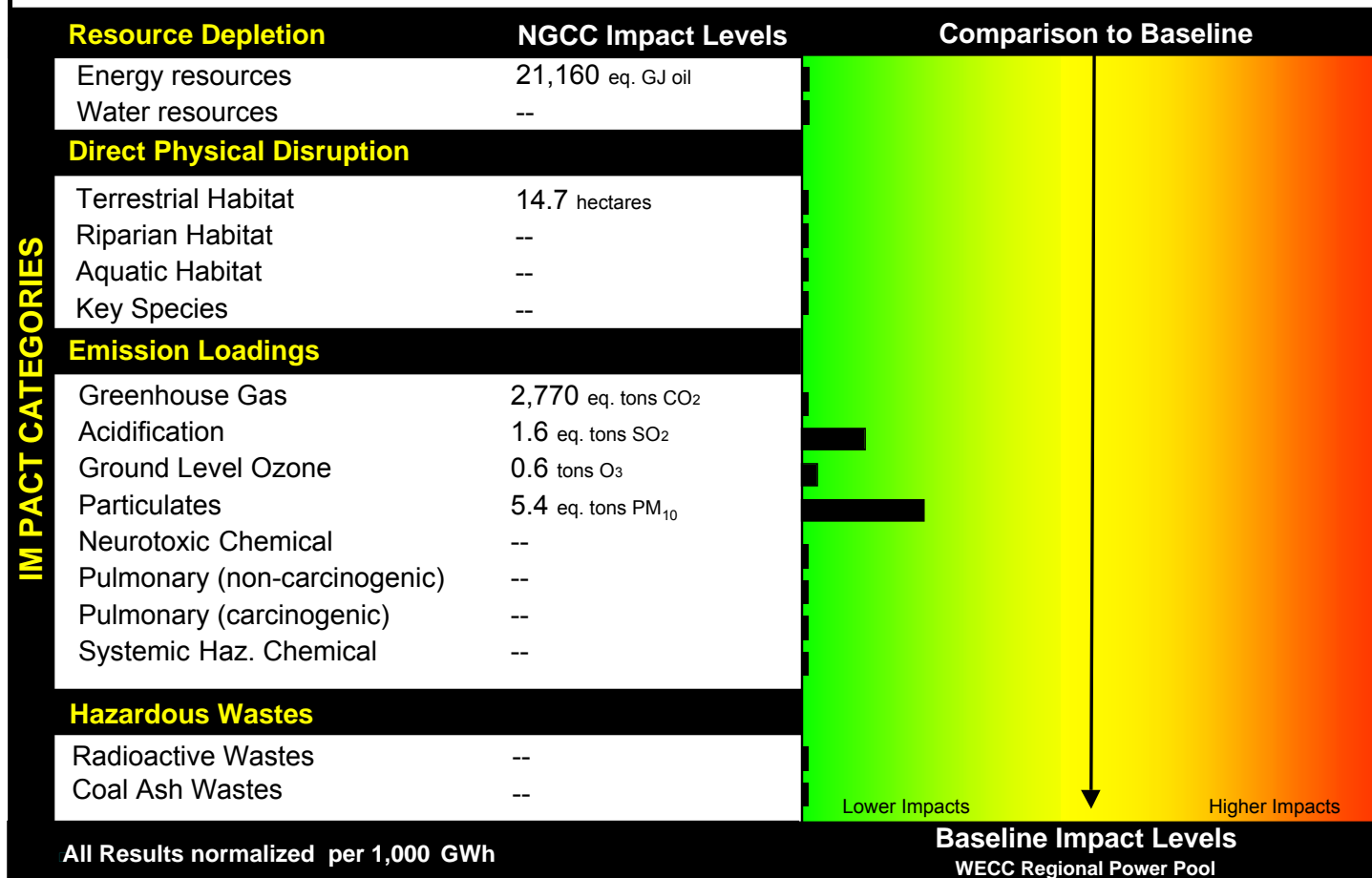
Noise

Hazardous Wastes

e.g. Radioactive Wastes

Environmental Impact Profile

Ecological footprint of the Stateline Wind Power Generation System (vs. WECC Baseline)



All Results normalized per 1,000 GWh

-- denotes negligible level



Environmental Impact Declaration*

Glen Canyon Hydropower Station

Hydropower Function Case

Depletion of Natural Resources	Impact Levels	Compared to Regional Grid	
Non-Renewable Energy	1,011 barrels eq. oil		
Water	--		
Strategic Metals	--		
Terrestrial Habitats	--		
Wetland Habitats	66 hectares		
Lake Habitats	--		
River Habitats	--		
Key Species	--		
Impacts from Emissions			
Greenhouse Gases	71 tons CO ₂		
Oceanic Acidification	23 tons CO ₂		
Acid Rain	--		
Smog	--		
Soot (PM 2.5)	--		
Neurotoxicity	--		
Systemic Chemical Toxicity	--		
Eco-Toxicity	--		
Risks from Hazardous Wastes			
Radioactive Wastes	--		

Lower Impact Level Higher Impact Level

Average Impact level of Regional Grid

* Based Upon Life-Cycle Impact Assessment