

Proposed Methods for Analyzing Feasibility, Costs, Benefits of Water Storage Projects in Oregon

SB 839 Economic Subgroup Report, Feb. 1, 2014

A FEW POINTS TO HIGHLIGHT

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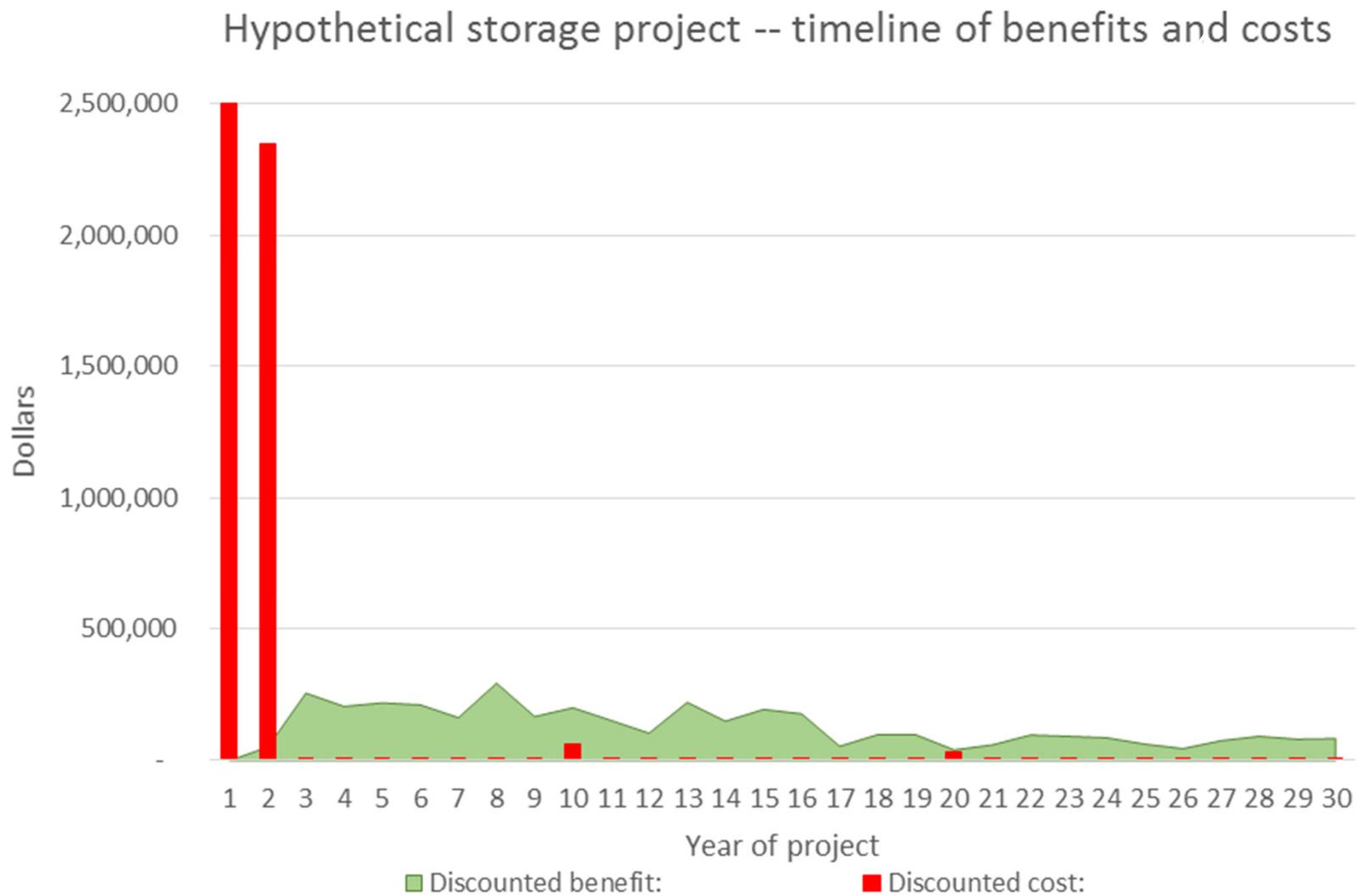
Cost-benefit analysis: Should we pursue this project?

- ▶ Attempts to value all economic, social-cultural, and environmental changes resulting from a project
- ▶ Allows comparing each project proposal to the status quo, or each other, in a consistent manner using a common metric
- ▶ Costs and benefits should be based in present value dollar amounts, reflecting both private and social values for changes in quantity or quality of identifiable resource stocks or flows
- ▶ Appropriate geographic scope must be chosen
- ▶ Cost-benefit analysis is distinct from “regional impact” or “input-output” analysis

Figure 12. Example Costs and Benefits

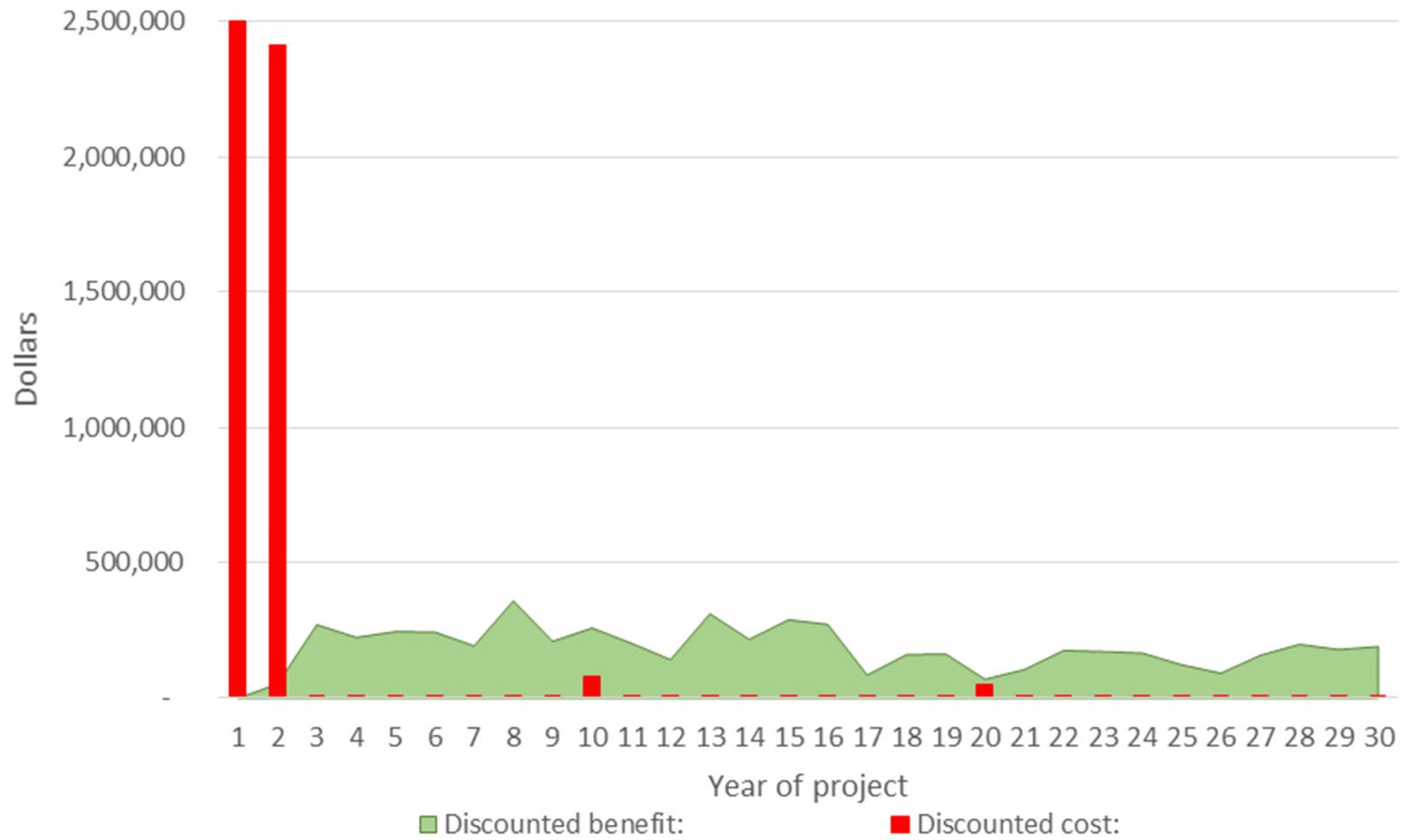
Example Costs	Example Benefits
<p>Capital Construction Costs</p> <ul style="list-style-type: none"> • Acquisition of lands and rights of way • Relocation of uses or improvements (e.g., houses, railroads, farms, parking lots, fences, etc.) • Environmental permitting • Environmental compliance and mitigation • Design/engineering • Feasibility studies • Data collection /scientific investigations (e.g., surveys, drilling geotechnical holes) • Contracting • <u>Construction, including management/oversight</u> <p>Operations, Maintenance, Replacement Costs</p> <ul style="list-style-type: none"> • Costs to operate facilities, such as labor, overhead, materials, supplies, utilities • Power costs for pumping • Replacement of equipment or infrastructure during the life of the project, such as gates, valves, pumps, etc. 	<p>Water for Irrigation</p> <ul style="list-style-type: none"> • Value calculated from increased crop value and acreage, water right transactions, farmland rental rate <hr/> <p>Water for Municipal, Industrial, Domestic Use</p> <ul style="list-style-type: none"> • Costs that would have been incurred to develop the next best source <hr/> <p>Power</p> <ul style="list-style-type: none"> • Value based on price for kilowatt hours produced via hydropower or other mechanism <hr/> <p>Water for Instream Uses</p> <ul style="list-style-type: none"> • Value based on benefits to fish and wildlife, recreation, water quality, or scenic waterways • Nonmarket valuation or benefit transfer methods (willingness to pay for environmental benefits by relevant population) <hr/> <p>Flood Control</p> <ul style="list-style-type: none"> • Estimating the reduced flood risk seasonally when unfilled reservoir capacity would buffer against costly flood event (i.e. flood damages prevented)

Discount rate: 7%



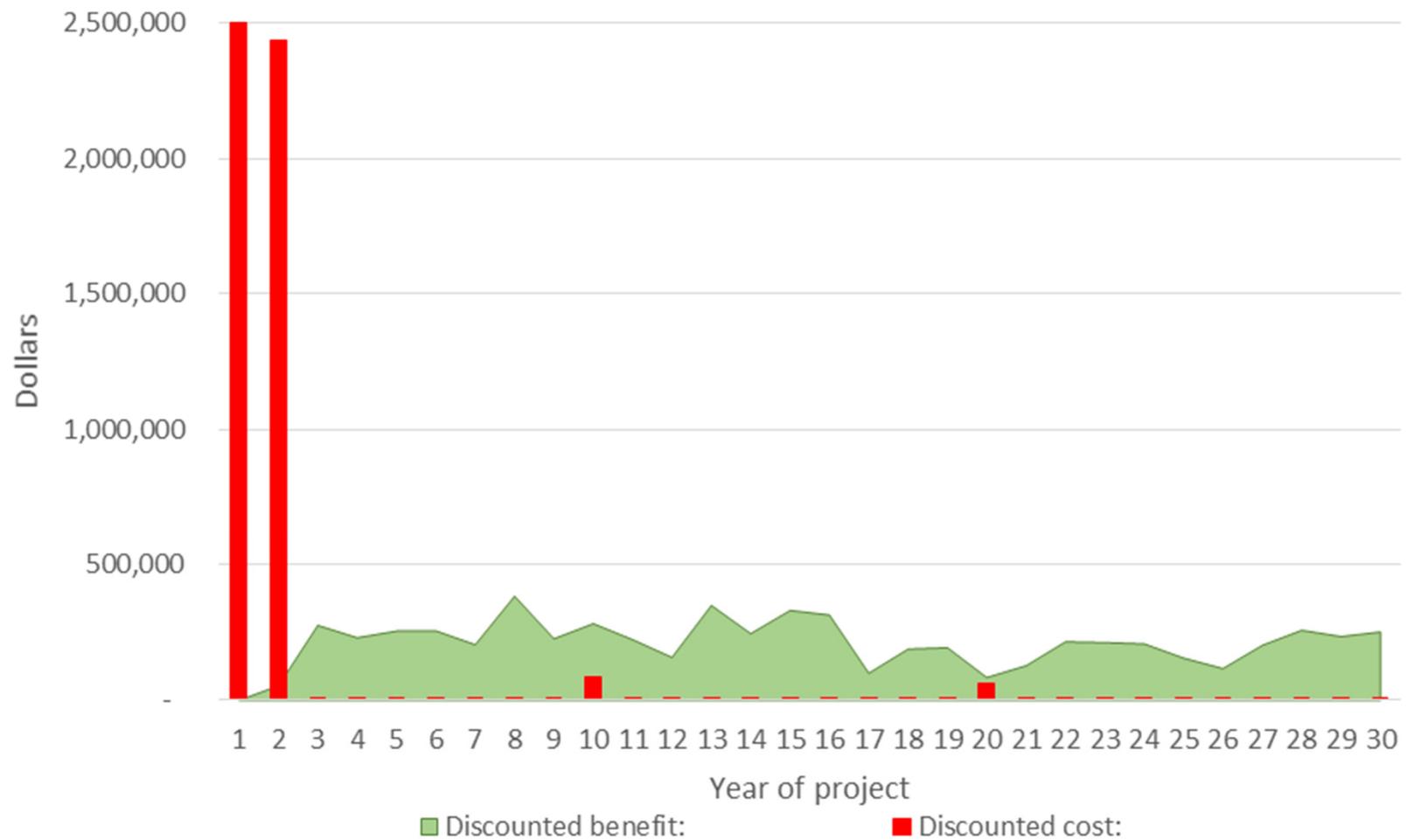
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Hypothetical storage project -- timeline of benefits and costs



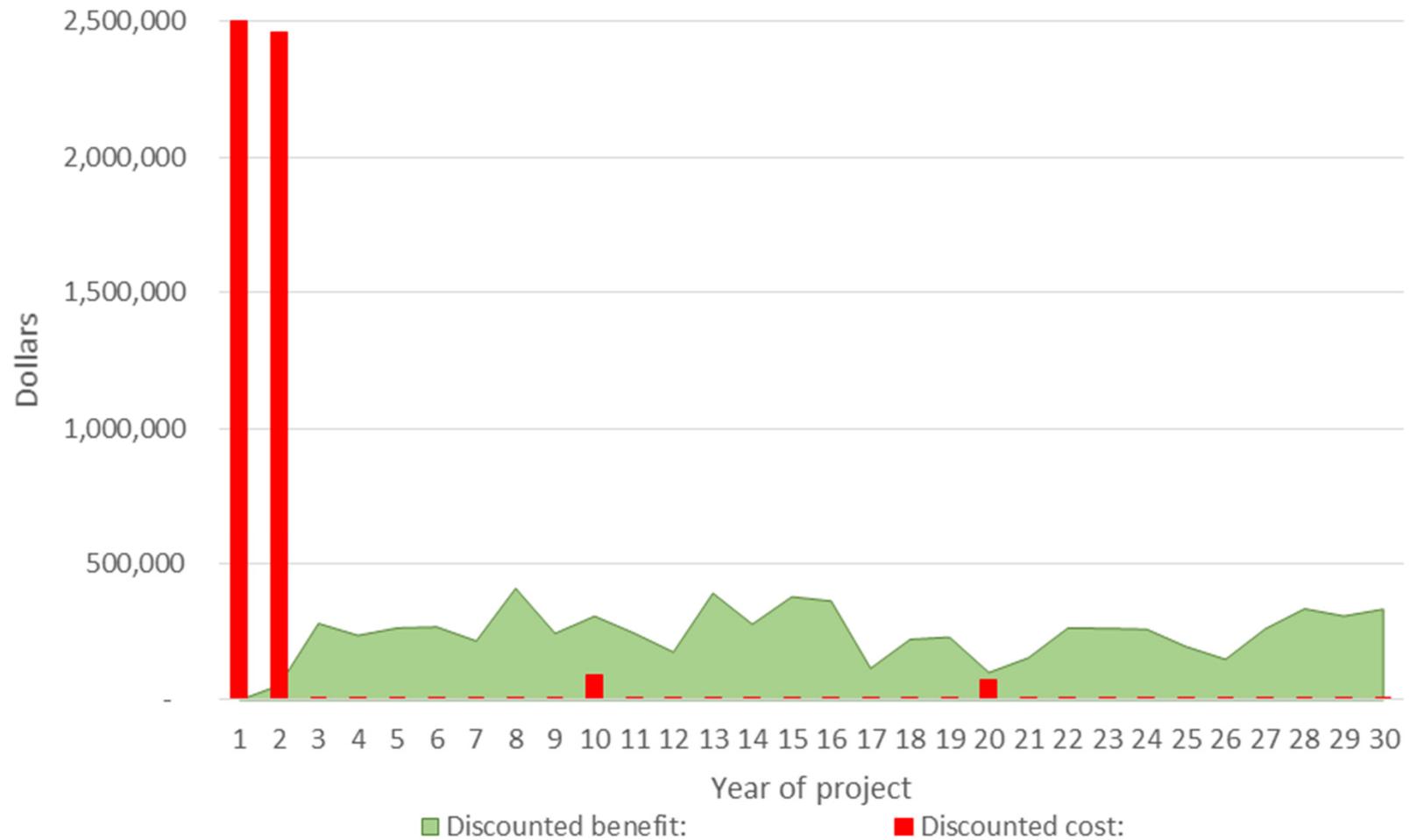
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Hypothetical storage project -- timeline of benefits and costs



2%

Hypothetical storage project -- timeline of benefits and costs



Factors affecting benefits and/or costs in a storage project

	<u>Effect on costs</u>	<u>Effect on benefits</u>
Size of storage facility	↑	↑ ?
Geology, topography	↑↓	↑↓
Environmental compliance	↑	↑
Cost of electricity	↑	↑↓
Crop production costs, rev. (irrigation)		↑↓
Cost of alternative sources (municipal)	↑↓	↑↓
Risks: water source reliability,		↓
climate change		↓

Cost-Benefit Analysis – Key Questions:

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- ▶ Are the costs being accurately estimated?
- ▶ Are the (pecuniary) benefits being accurately estimated?
- ▶ Are the social/external costs and benefits being fully recognized?
- ▶ Is the geographic scope for social costs and/or benefits appropriate?
- ▶ Is the discount rate appropriate?