Financing Stormwater Projects: Providing an Innovative Vision

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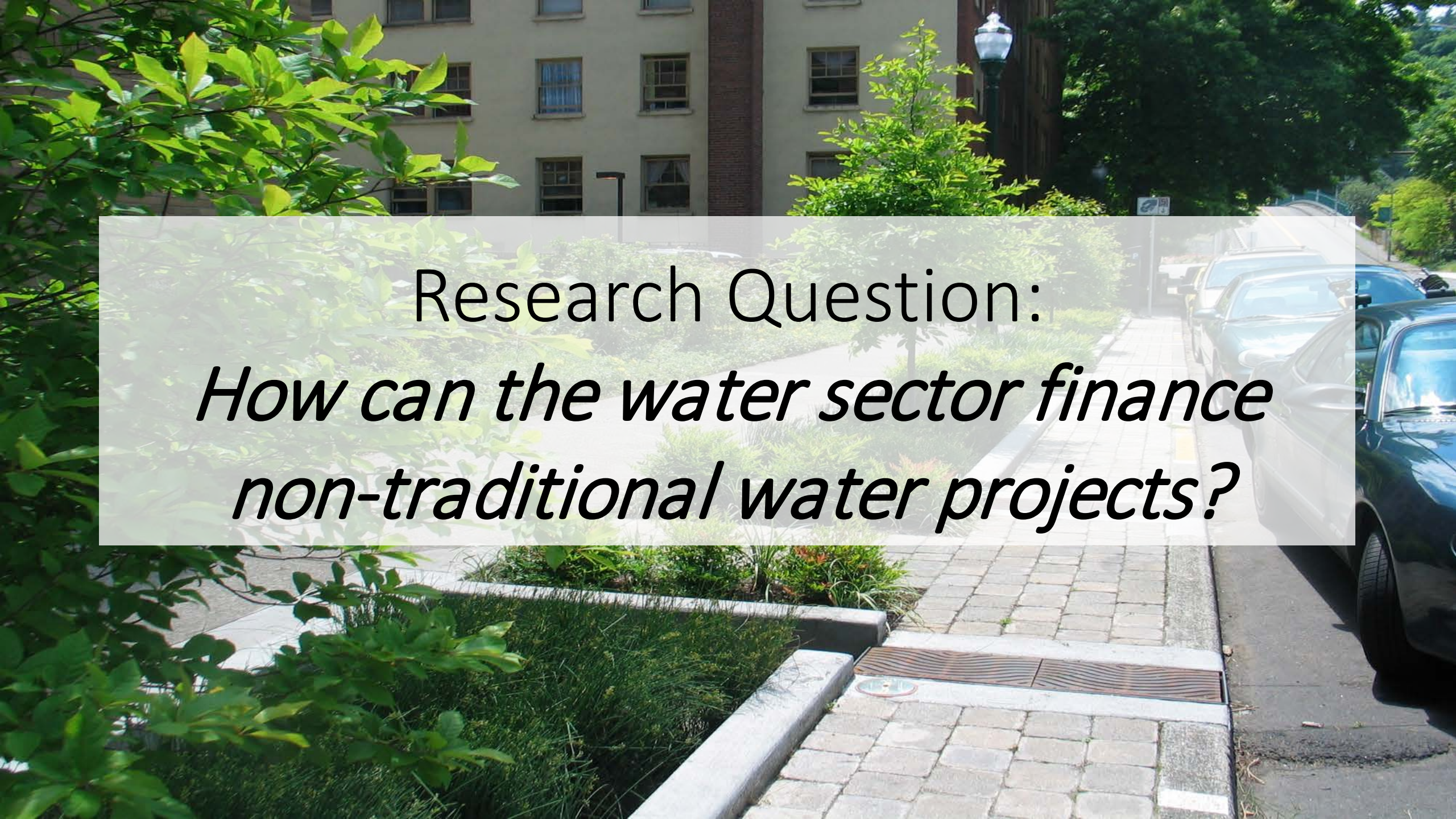


Research Question:

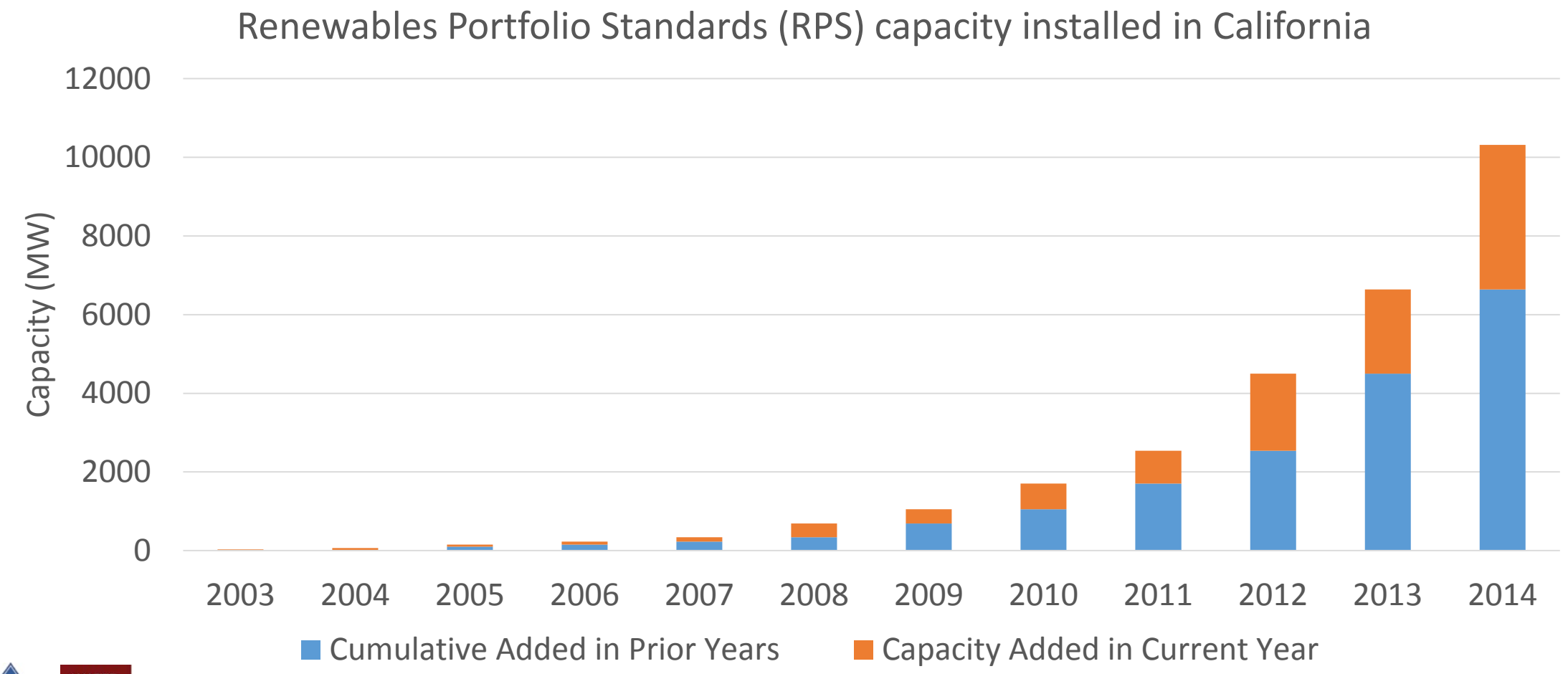
How can the water sector finance non-traditional water projects?

Methodology

1. Gather case studies of non-traditional (innovative, multipurpose, and small- to medium-scale) infrastructure projects
2. Identify common elements among case studies
3. Create a financing framework
4. Identify funding mechanisms we believe could be **most useful to the water sector**

Looking to the Electricity Sector

Evolution of the Electricity Sector



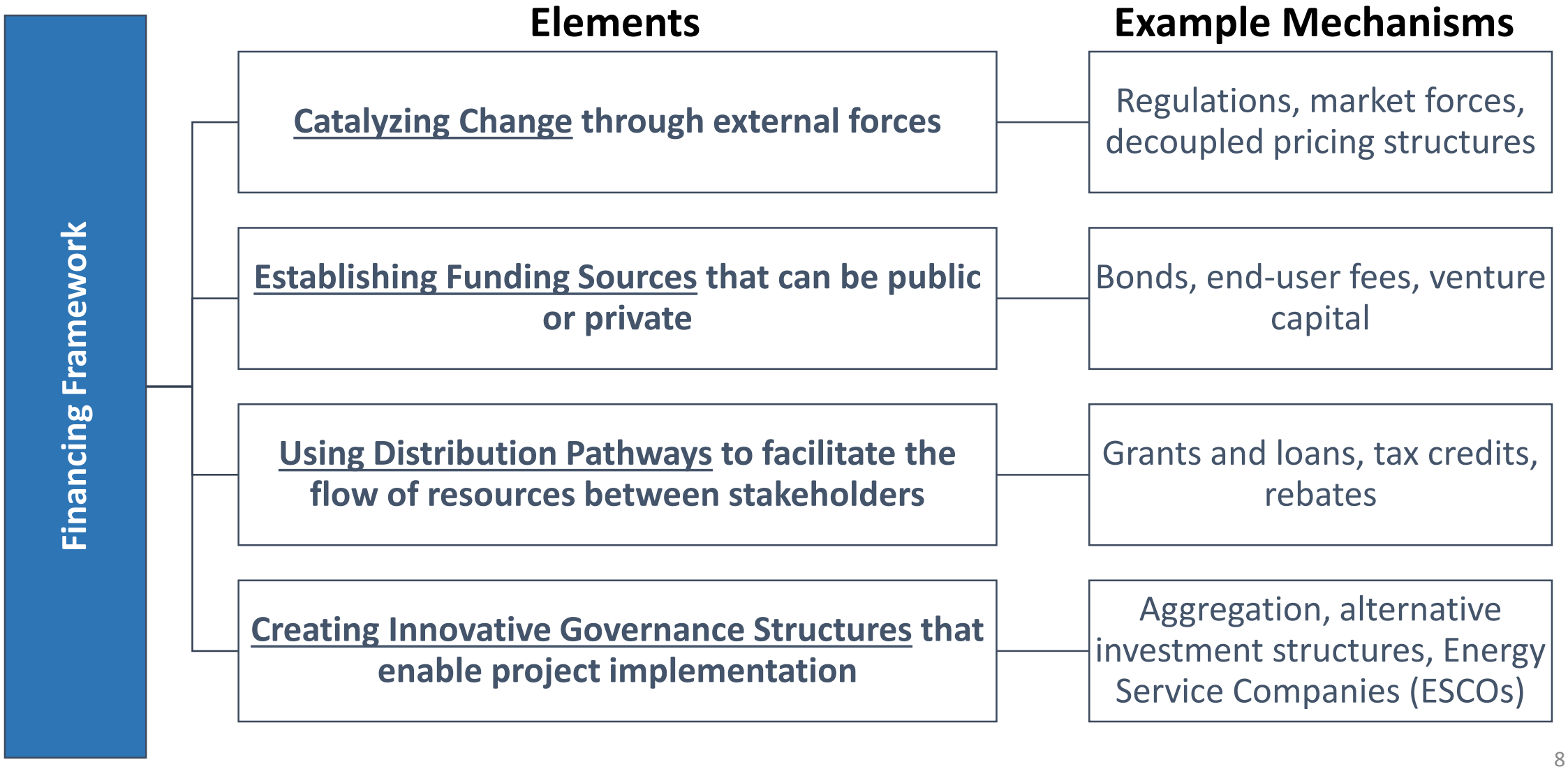
Source: California Public Utilities Commission 2015b

Evolution of the Electricity Sector: Overcoming Barriers

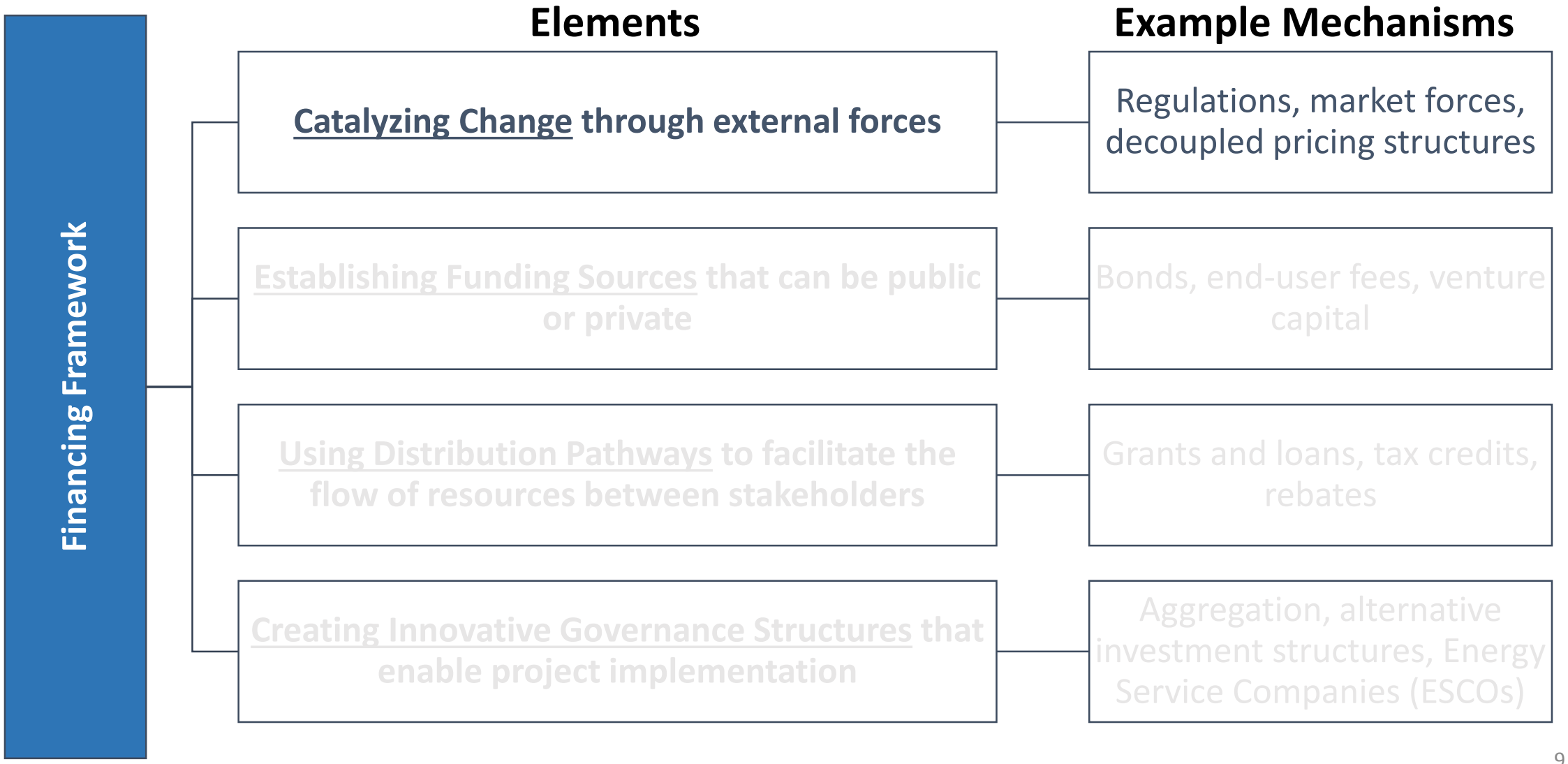
- Limited access to traditional public funding resources
- Difficult to secure private investments
- Regulatory challenges
- Perception towards change

Financing Framework

Financing Framework



Financing Framework

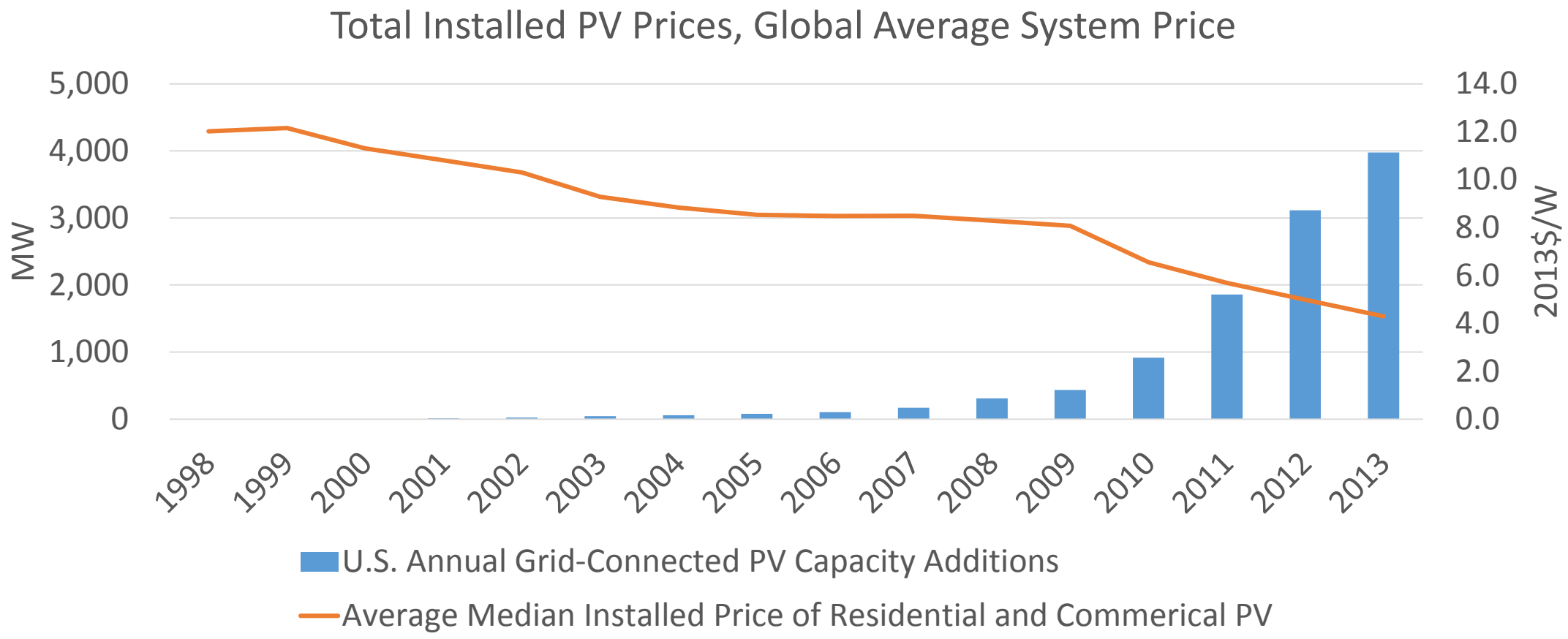


1. Catalyzing Change

- Regulations
- Market Forces
- Price Structuring and Revenue Decoupling

Policies and economic forces drive change

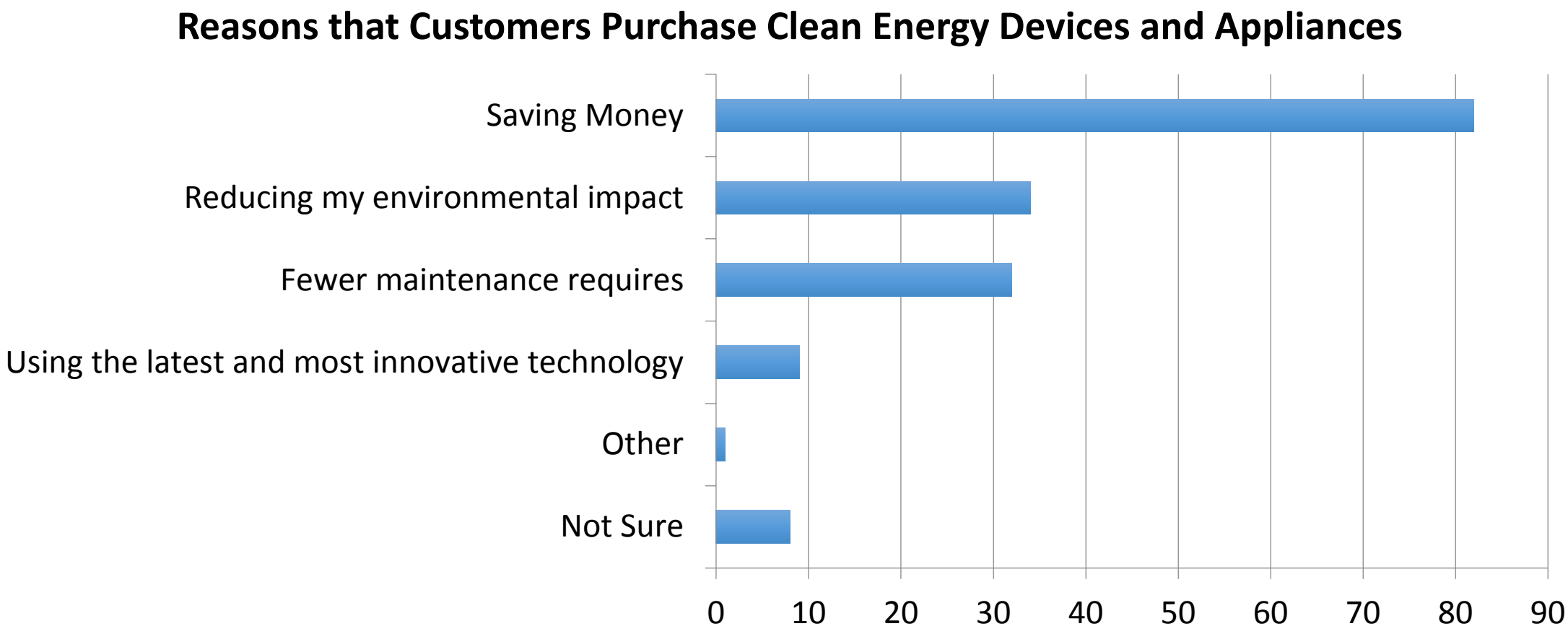
1. Catalyzing Change
Passive Economic Incentives



Source: Barbose, G. Weaver, S. & and Darhouth, N. (2014)

Note: Price is average of median of all sizes (<10, 10-100, >100 MW) and from a sample of data.

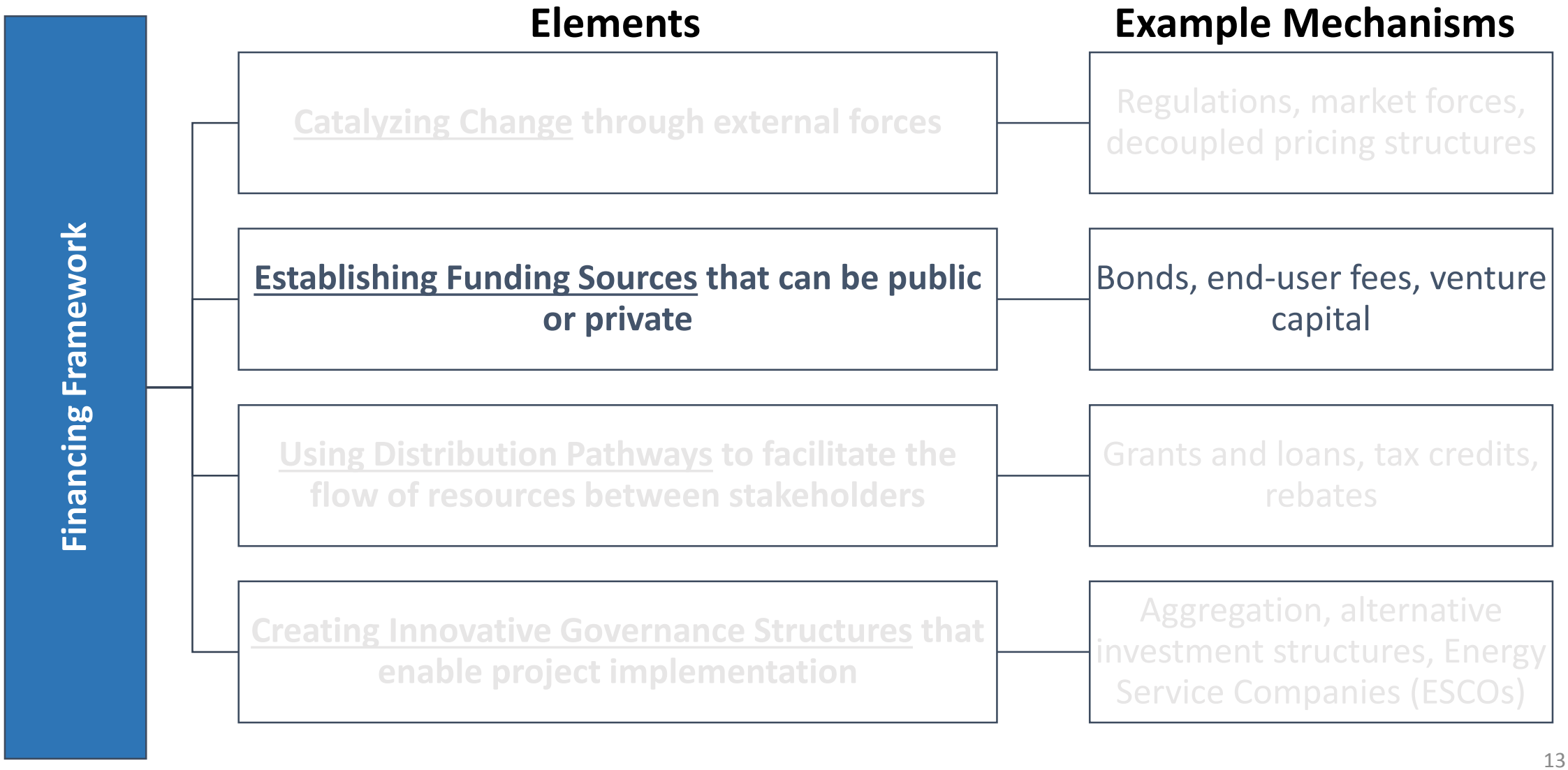
1. Catalyzing Change
Active Economic Incentives



Source: U.S. Homeowners on Clean Energy: A National Survey. 2015 Poll Results and Clean Energy Growth Trends. Solar City and Clean Edge

Note: Survey respondents were asked the following question: "When making decisions around purchasing clean-energy products and services, which of the following are your primary motivators? (Choose up to two)"

Financing Framework

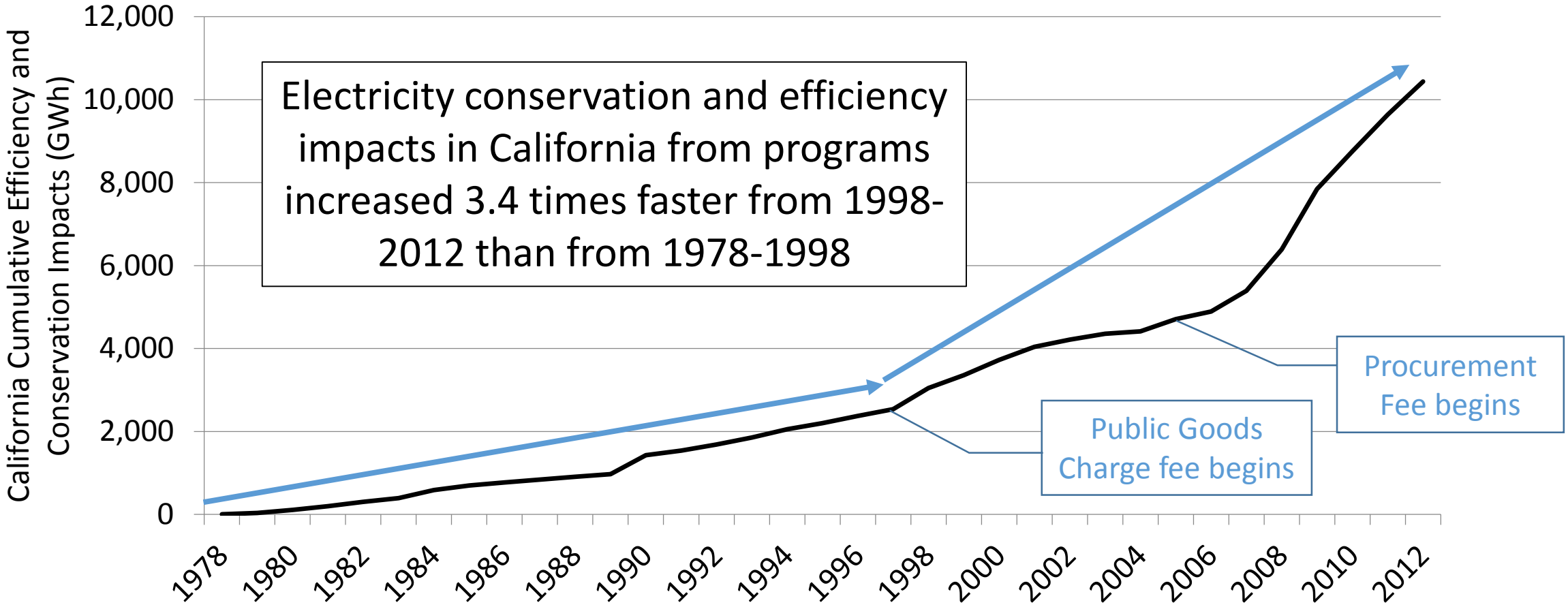


2. Establishing Funding Sources

- **Public Sources**
  - Taxes
  - Bonds
  - Revolving F
  - End-User Fe
- **Private Sour**

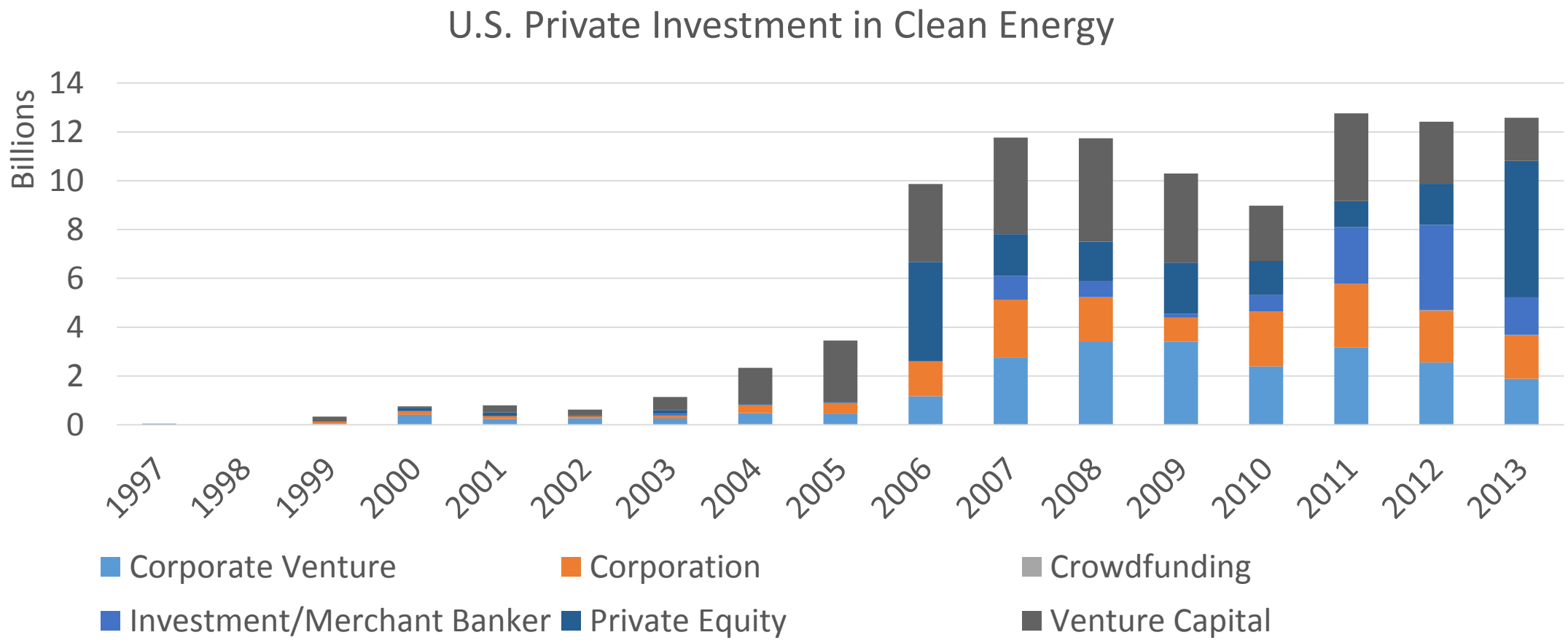
Look beyond traditional funding sources

2. Establishing Funding Sources
End-User Fees



Source: California Energy Commission 2013

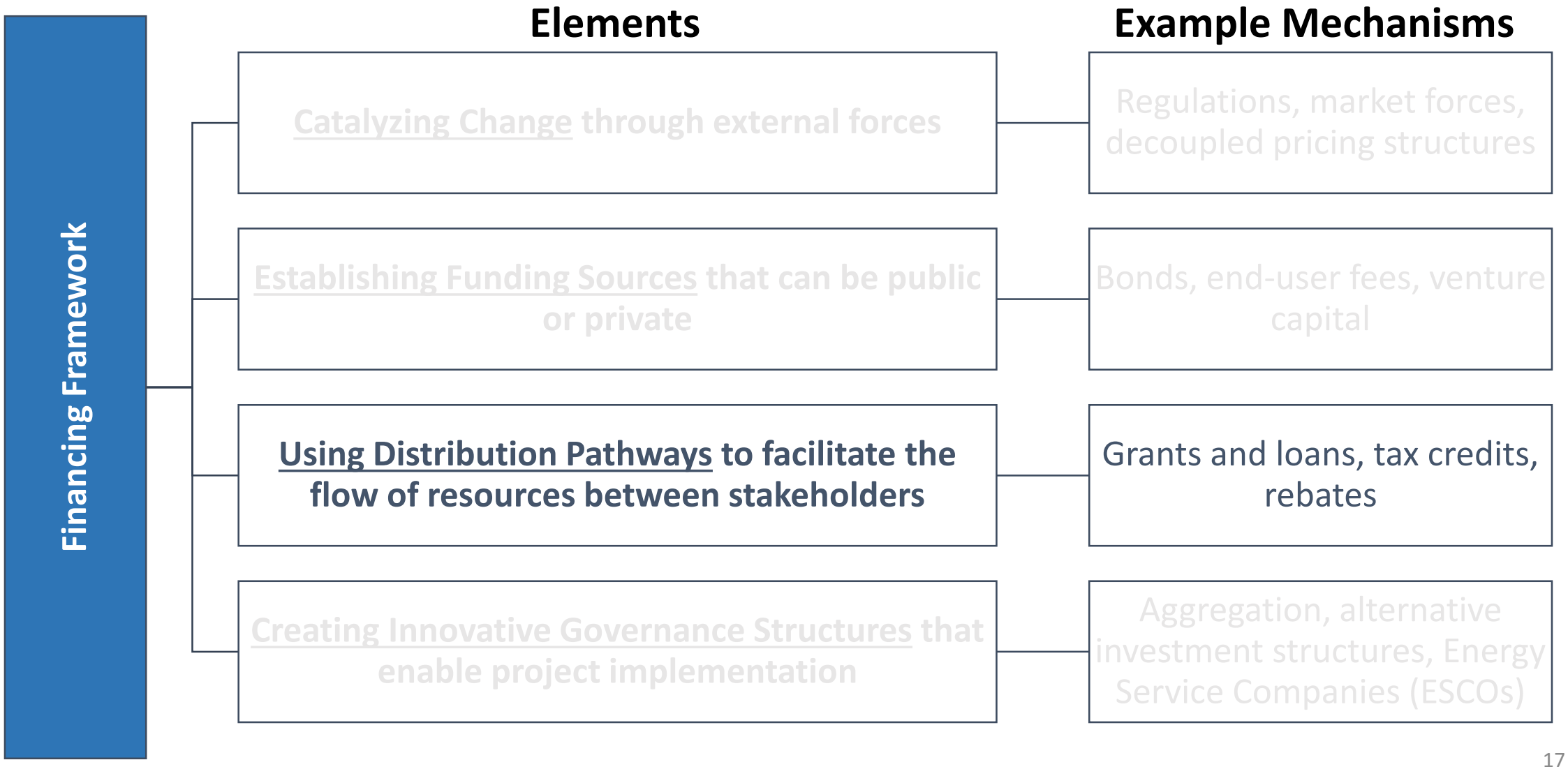
2. Establishing Funding Sources
Private Capital



Source: Cleantech Group 2014

Note: Clean energy = biomass generation + energy efficiency + energy storage + solar + wind + geothermal + nuclear + hydro & marine + smart grid. Non-private categories of investment not shown here are debt funds, public sector funding, and other.

Financing Framework



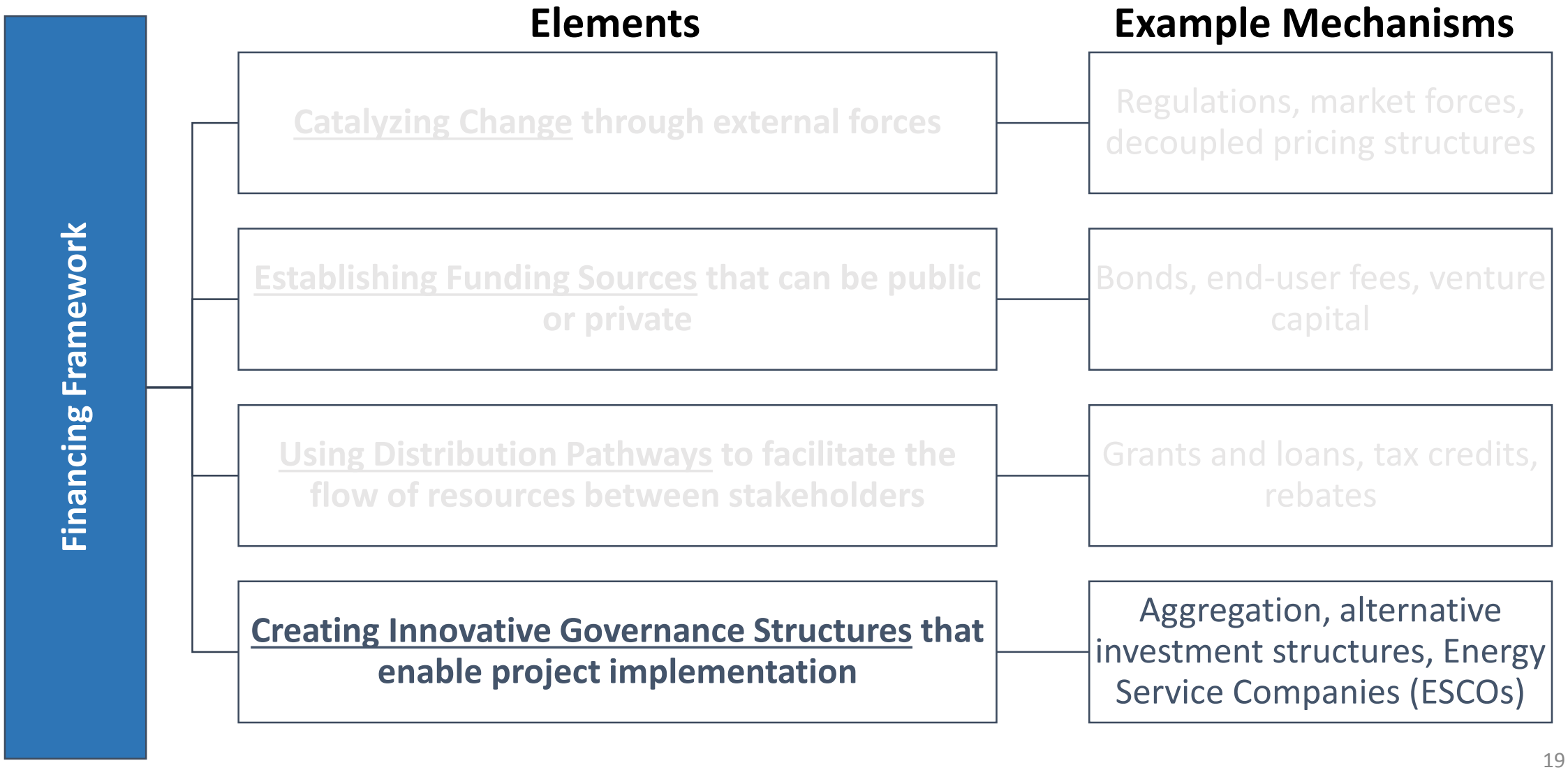
3. Using Distribution Pathways

- Government Grants and Loans
- Rebates
- Tax Credits
- **On-Bill Initiatives**

Mechanism	Financial Backer	Repayment Mechanism
On-Bill Financing (OBF)	Utility shareholders, utility ratepayers, public	Utility bills
(OBR)		Utility bills
Property Assessed Clean Energy (PACE)	Private investors through bonds	Property tax bills and assessments

Cost-sharing with end-users encourages participation

Financing Framework

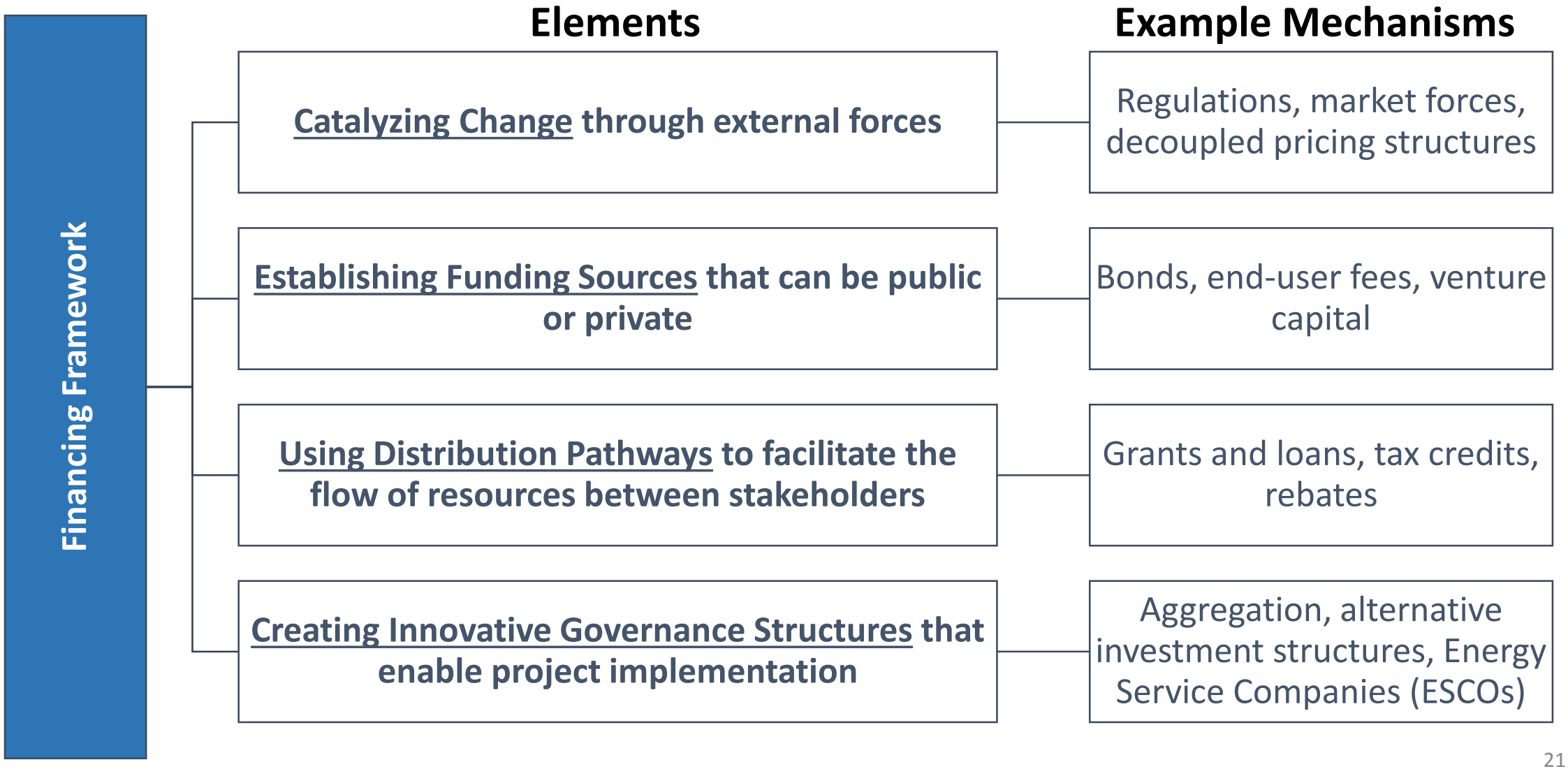


4. Creating Innovative Governance Structures

- Project and Financial Aggregation
- Green Banks
- Alternative In
- End-to-end s
- Lease and Pu
- Net Meterin

Utilize a diverse financing strategy to minimize risk and increase economic potential

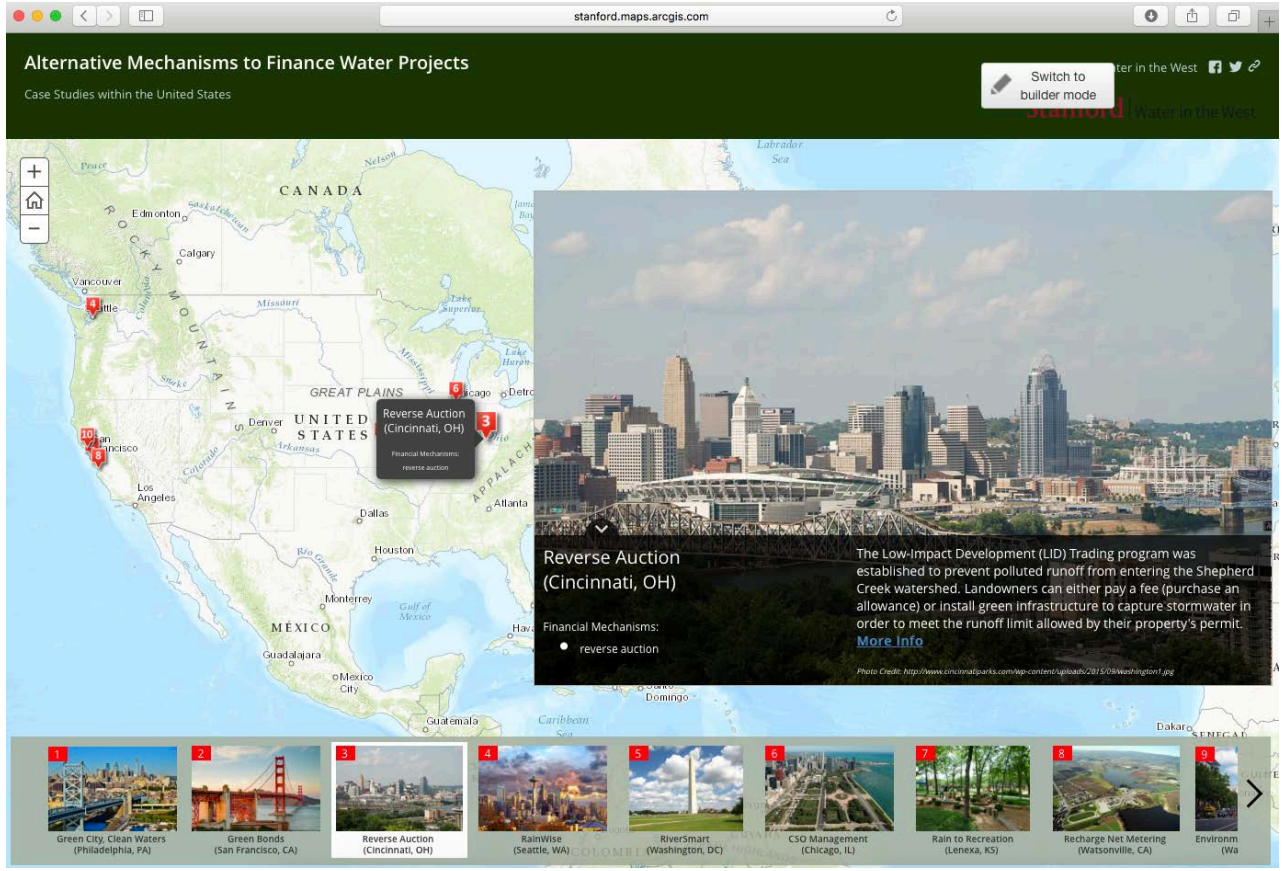
Financing Framework



Financing Stormwater- Living Map

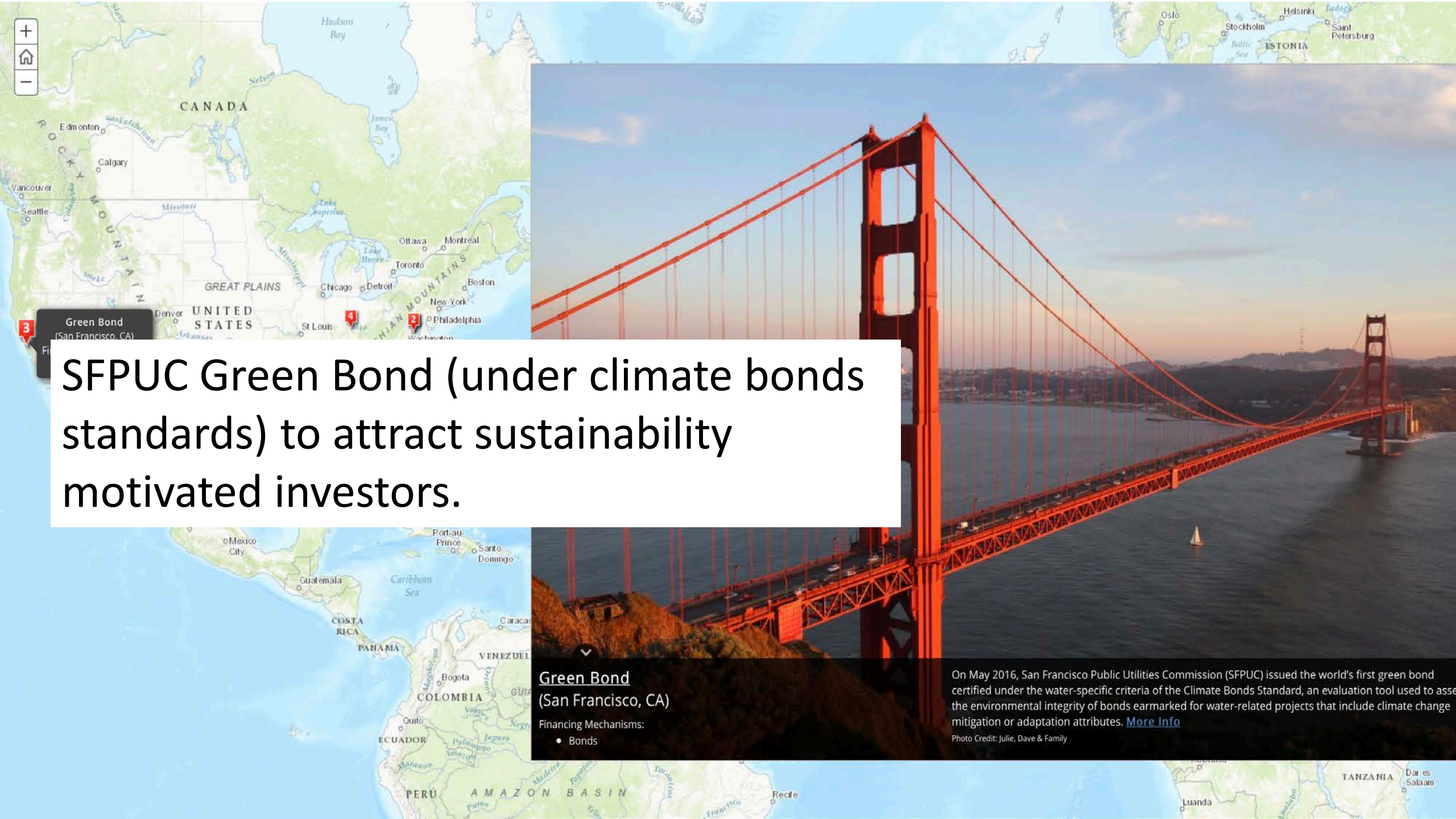
<u>Mechanisms Highlighted:</u>

- Stormwater Fees
- Reverse Auction
- Performance-Based Rebates
- Stormwater Credit Trading Program
- Grant Programs
- Environmental Impact Bond
- Project Aggregation



D.C. Storm Water Retention Credit Trading

- Direct Regulation
- Credit Trading platform



SFPUC Green Bond (under climate bonds standards) to attract sustainability motivated investors.

Reverse Auction in Cincinnati Ohio

- Direct Regulation
- Reverse Auction-to attain the highest environmental benefits for the lowest price

Food for Thought

- Enact policies and economic forces to drive change
  - Portfolio standards, demand-side management and pricing
- Establish more innovative funding solution
  - Green banks, impact investment, on-bill financing and net-metering
- Utilize a diverse financing strategy to minimize risk and increase economic potential
- Cost Sharing and customer-based financing can be an ***enabler*** at every scale
  - Developer, end-user, communities and municipalities

Thank you
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Full Report:
https://goo.gl/WIM3jA

Research Brief:
https://goo.gl/zy0g4h