

# Green finance for blue waters

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**A global overview of  
innovative economic  
instruments &  
incentives.**



**Green finance, can be the enabler...**  
(So can innovative economic instruments & incentives)



# What are we going to cover?

## Part 1 – Introduction to green finance

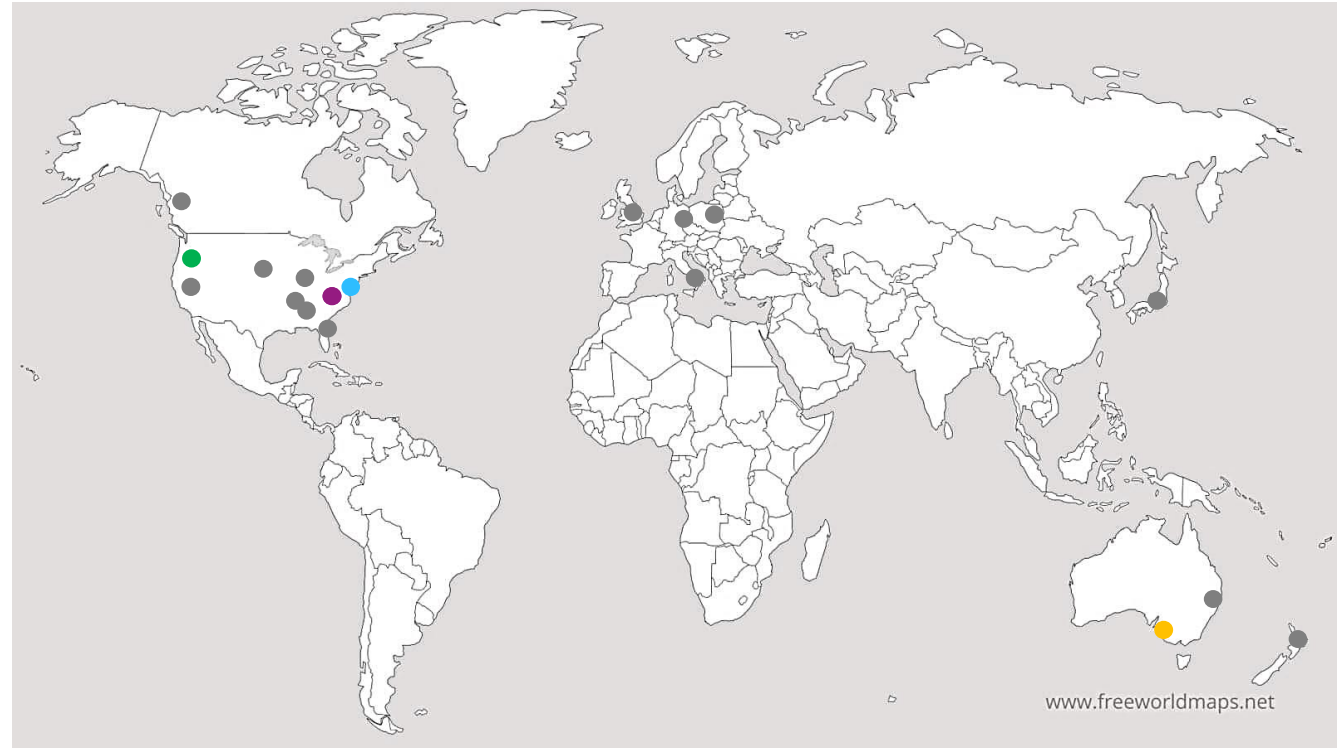
## Part 2 – Market-based mechanisms:

- Stormwater utility charges / impervious tax  
[Alexandria, Virginia, USA](#)
- Green infrastructure incentives and credits  
[Alexandria, Virginia & Portland, Oregon, USA](#)
- Stormwater offsets  
[Melbourne, Aus](#)

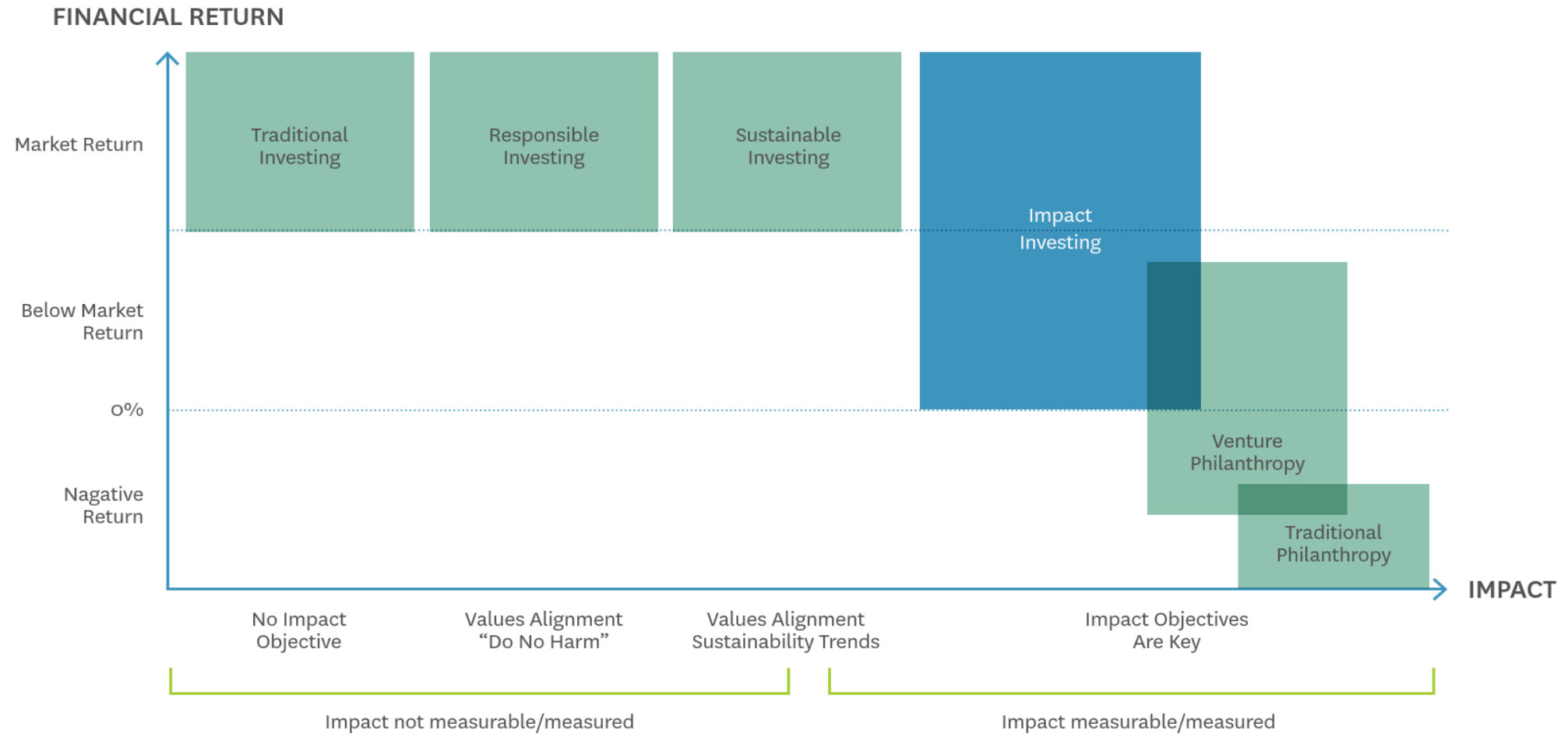
## Part 3 - Investment and delivery instruments

- Environmental Impact Bonds  
[Washington DC, USA](#)

## Summary



# Part 1: Introduction to green finance

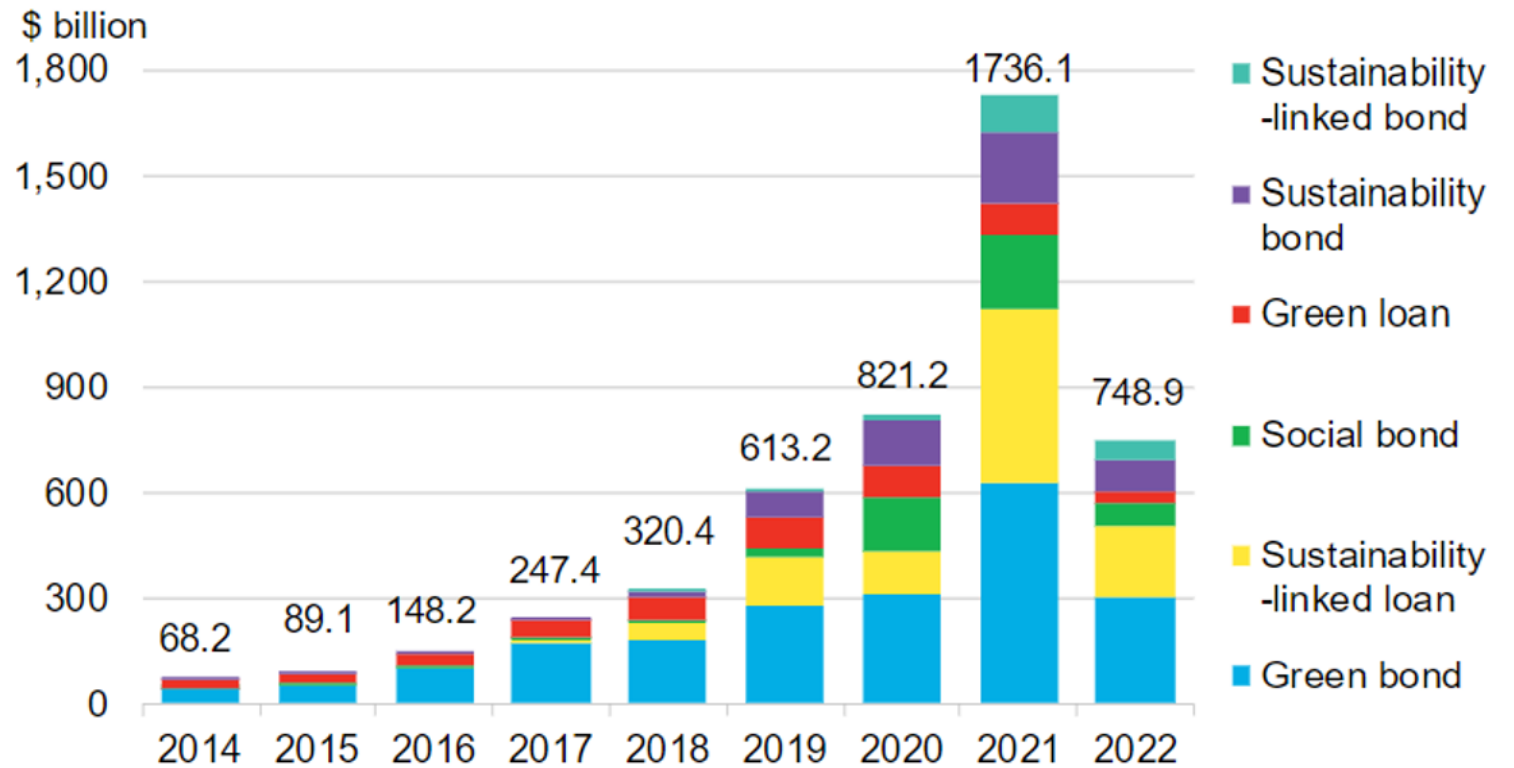


Source: Impact Investment Part One, Centre for Social Impact and the Ākina Foundation

# The investment landscape is changing

- There is tremendous international demand from the **private sector** to invest in **climate resilience**, **ecological restoration** and **infrastructure adaptation** projects to address the global environmental crisis
- Traditionally stormwater investments fall under green bonds ‘municipal bonds’.
- Projects, bond issuers and investors want to see **evidence, not advocacy**.
- There is big movement from green bonds > impact bonds.

## Annual sustainable debt issuance



Source: BloombergNEF, Bloomberg Terminal.

# Part 2: Market-based mechanisms:

## **Incentives**

(Subsidies, grants, cost shares, fee credits)



**...& disincentives**  
(Impervious surface taxes,  
utility charges)

# The tragedy of the commons... Can incentives help?

“A problem in economics where **individual users**, who have open access to a public resource (a common) unhampered by social structures or formal rules, **act independently** according to their own self-interest and, contrary to the **common good** of all users, cause degradation through their **uncoordinated action.**”

Examples:

- Some **maintain** their onsite drainage network, others don't...
- Some **treat** stormwater runoff, others don't...
- Some limit **impervious surfaces**, others pave everything...
- Some maximise **conveyance**, others slow the flow...



**Mayor Wayne Brown shovelling bark from blocked manhole.**

<https://ourauckland.aucklandcouncil.govt.nz/news/2024/05/stormwater-compliance/>

# Toolbox item 1: A Stormwater utility charge

## What is it?

- An equitable assignment of cost to a property owner that is proportionate to the demand placed on the stormwater network from each property.
- Commonly referred to as an impervious tax, or “rain tax”.

## How are fees calculated?

- Equivalent Residential Unit (ERU) is a base billing unit.
- Achieved through GIS analysis, consented plan, as-built drawings.
- Residential properties in the US pay between \$8 and \$35 / month (annual prices shown here).



Building and parking lot impervious area	573 m <sup>2</sup>
1 ERU	191 m <sup>2</sup>
Total ERUs	573 / 191 = 3 ERU
Multiply by rate	3 ERU x NZD \$490
Total annual fee	NZD \$1,470

(All prices are per annum, as of May 2024, City of Alexandria, Virginia, USA)



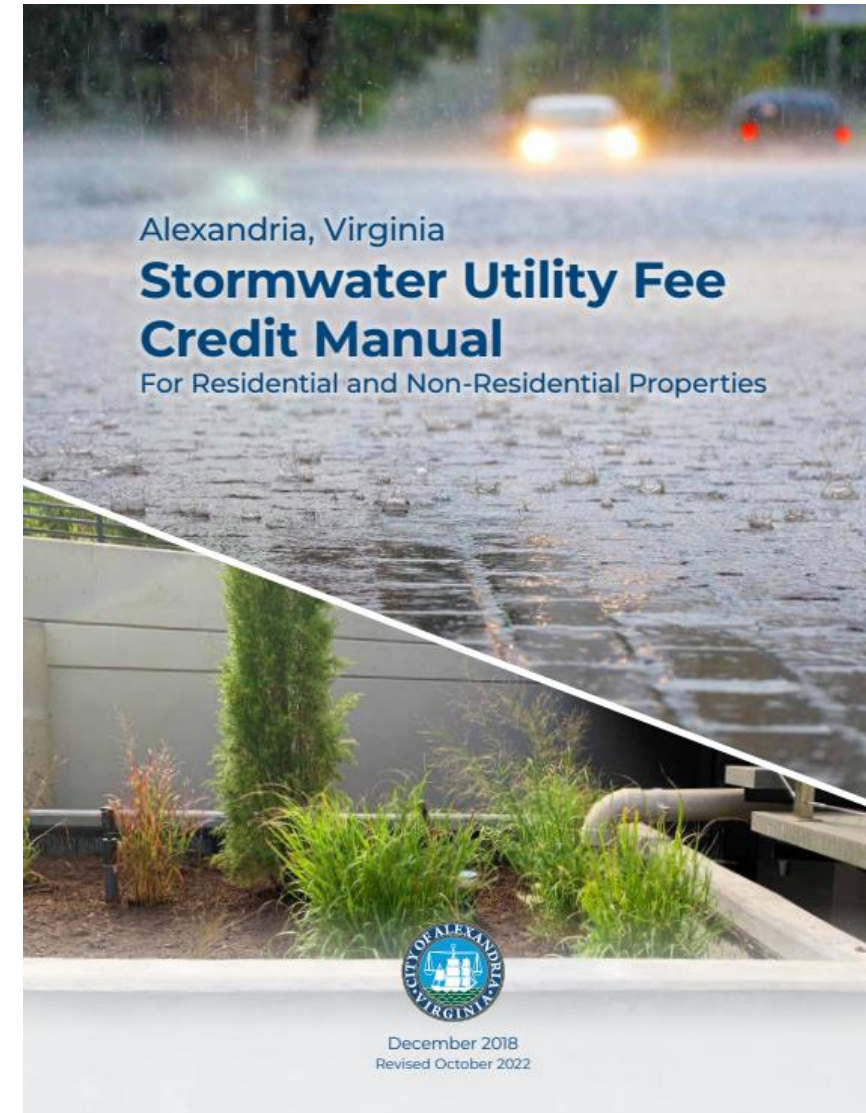
# Toolbox item 2: Stormwater credits

## What is it?

- A rebate that provides an opportunity to reduce the stormwater utility charge/fee charged by your local municipality.
- You can receive a rebate for implementing best practice, like recycling stormwater, installing swales, reducing fertilizer use.

## What are the benefits?

- By taking advantage of credit options property owners can typically reduce their rates bill up to 50%!
- Reduces load of the stormwater network.
- Credit programs promote the idea that we all have a role to play with stormwater runoff (a common).



Source: Stormwater utility credit manual 2022, City of Alexandria, Virginia, USA



*Rain Barrel*



*Flow Thru Planter Box*



*Vegetated green roof*



*Permanent doorway flood panel*



*Passive flood gate at entrance to parking garage*



*Bioretention facility*

# Examples of credit menu



TABLE 2: RESIDENTIAL PROPERTIES CREDIT MENU

<b>Eligible Landscaping Practices<sup>b</sup></b>	No Fertilizer Pledge	10%
	Conservation Landscaping	10%
	New Tree Planting	Up to 30% (one-time credit)
	Mature Tree Preservation	Up to 20%
<b>Dry Floodproofing Practices</b>	Protective Barriers/Walls	10%
	Permanent Doorway Flood Gate or Panel	10%
	Passive Flood Gates	10%
	Floodproof Windows	10%
	Basement Window Protection	10%
	Ground Floor/Basement Custom Window Wells	10%

# Case study: City of Portland, Oregon, USA

## Portland's Grey to Green Program:

- New buildings with a net building area of  $> 1,858\text{m}^2$  must have an ecoroof that covers 100% of the building area.
- At least 50% of the vegetation must be an evergreen species & it must reduce annual runoff volume by 50%.
- The Council provided grants for green roof installations  $\sim \text{NZD } \$88 / \text{m}^2$
- The city has an impressive array of incentives for property owners to implement green infrastructure, including its “treebate” program.
- They ended up with over 500 eco roofs...



# Toolbox item 3: Stormwater offsets



## What is it?

- A financial contribution paid by residential developers to a Council for improvements to be **undertaken in another location**.
- These works **'offset'** stormwater impacts not treated within the development if onsite stormwater treatment isn't practical or feasible.

## What are the benefits?

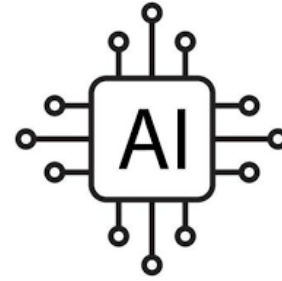
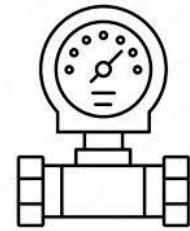
- Flexibility - if you can't meet the criteria, you can pay towards treatment in another area, ideally within that catchment.
- Promotes larger end of catchment scale devices.

## How is the offset rate measured?

- Nitrogen is the offset currency, and a price has been determined based on the cost of constructing regional wetlands.
- If nitrogen (the limiting pollutant) targets are achieved, then phosphorus and suspended solid targets are also achieved.
- NZD \$7,297/kg N (per kilogram of annual total nitrogen load) in stormwater runoff.

# Part 3: Investment and delivery instruments

- Stormwater is the ideal candidate for green finance **because the outcomes transcends water quality and quantity**, both of which can be modelled and measured.
- Retrofitting green infrastructure at catchment-scale is an obvious candidate for **green finance**.
- A reduction in flow, achieved by increased absorption or infiltration; or a reduction in contaminants, achieved by source control and/or treatment are both considered a beneficial outcome, or **environmental impact**.



WATER QUALITY SENSOR



# Toolbox item 4: The Environmental Impact Bonds (EIB)

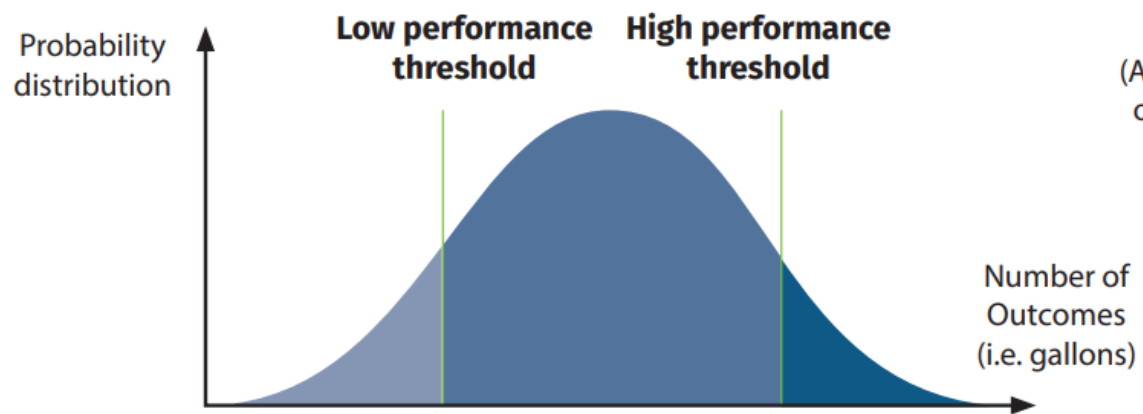
- The first ever EIB for **\$25m USD** was issued in 2016 by DC Water in Washington, US. Bond purchased by private investors.
- The proceeds were used to retrofit bioretention gardens, urban swales, kerb extensions, permeable pavements, and infiltration basins in parks across **200ha** of impervious urban land...
- Following 12 months of baseline measuring, a **30% reduction on runoff** was modelled post installation.
- The performance risks and benefits of managing stormwater runoff were shared among DC Water and the investors.



Park at Kansas Avenue & 2nd Street, NW funded by the DC Water 2016 Environmental Impact Bond. (image credit: DC Water)

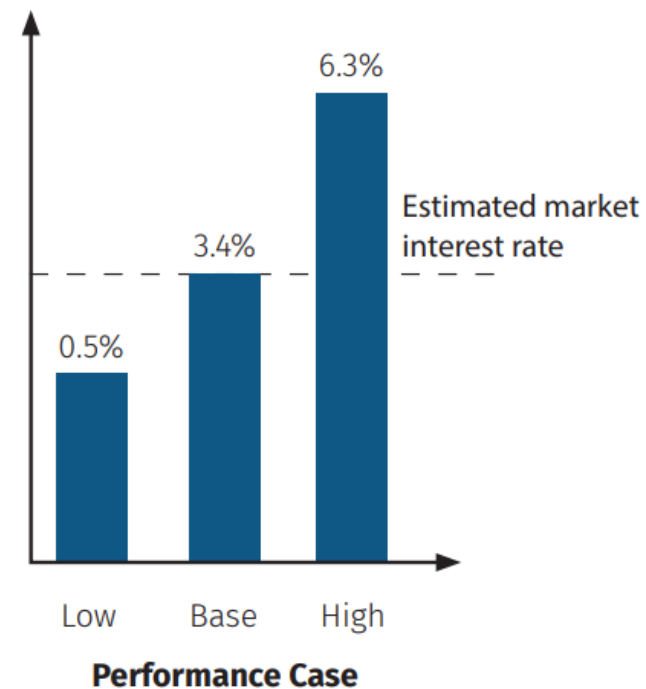
# Case study: Washington D.C, USA

## DC Water EIB Performance Structure



Performance:	Low	Base	High
<b>Fixed (Actual) Interest Rate:</b>	3.43% (market rate)	3.43% (market rate)	3.43% (market rate)
<b>Additional Payment:</b>	\$3.3M Clawback (Investors to DC Water)	None	\$3.3M Payment (DC Water to Investors)
<b>Probability:</b>	2.5%	95.0%	2.5%

**Effective Return (%)**  
(Actual interest rate + effect of performance payment)





# Implementation – the five guiding principles

## Sufficiency

Generation of funds need to be adequate to pay for the infrastructure costs



## Certainty

Funds need to be available when required



## Equitable

Polluter pays, proportionate to demand from each property (surface area).



## Efficiency

Funding mechanism must provide desirable env. & social outcomes



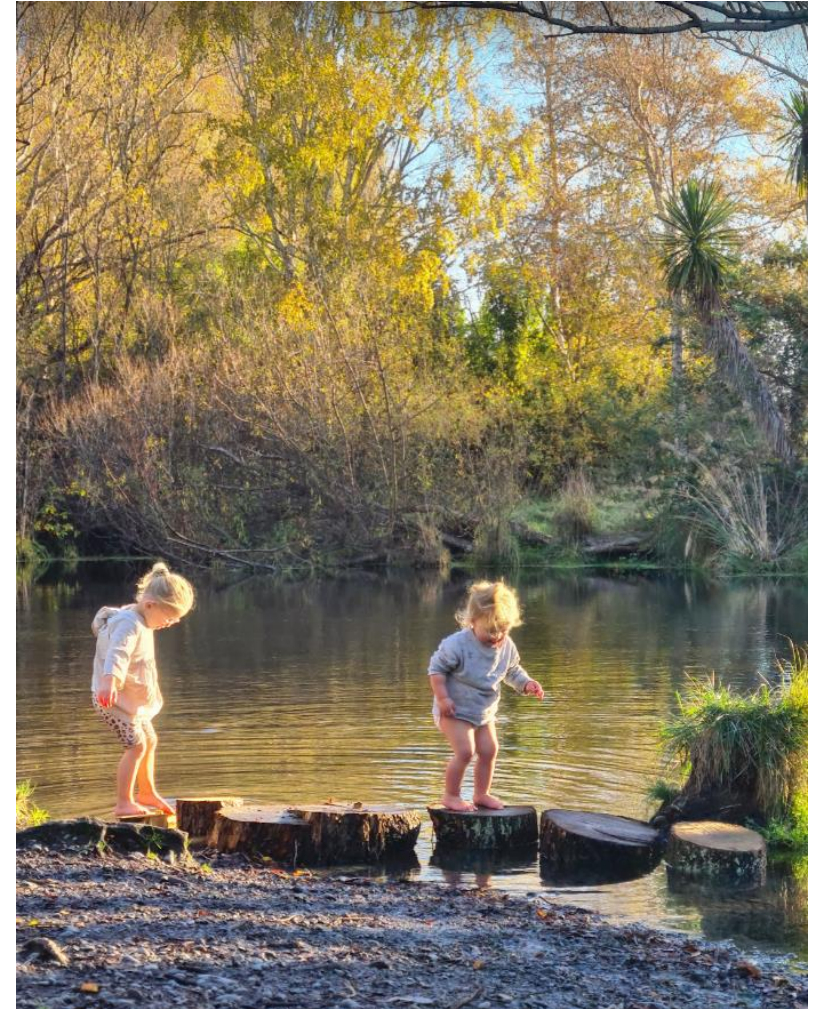
## Acceptability

Politically, socially, commercially.



# What would I like you to take away?

1. We need a stormwater **utility charge** to fund the present, and disincentivise future imperviousness.
2. We need **green infrastructure incentives** at the sub-division / catchment scale, linked to consenting fees / processing time.
3. We need a stormwater **credit system** to promote WSUD at household and commercial scale, linked to rates.
4. **Stormwater offsets** may be a solution to cope with the 'tragedy of the commons' (esp. for brownfield sites) – but treatment is largely reactive...
5. **Environmental impact bonds** are a well-tested financing and delivery model for green infrastructure.
6. When combined, these economic instruments will assist in creating **behavioral change** within the community and **increase awareness** of stormwater effects.



My daughters Freya & Selma playing at our favourite River. I think of stormwater runoff every time I go there.

Thank you! Questions?

