

Modeling the local dynamics of stormwater policy implementation

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Implementing LID in built areas

- Aging infrastructure, climate change, urbanization
- New development, relatively straightforward
- Can be disruptive in established areas



Challenges to LID implementation

**Awareness
barrier**

**Affordability
barrier**

Interest barrier



LID implementation policies

**Awareness
barrier**

**Affordability
barrier**

Interest barrier

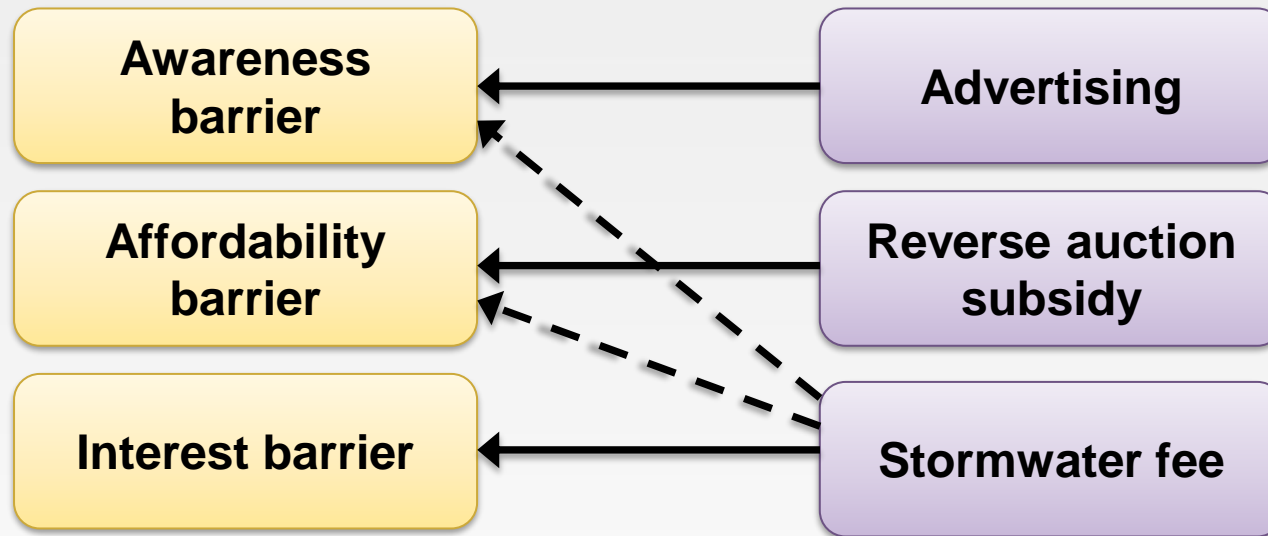
Advertising

**Reverse auction
subsidy**

Stormwater fee



LID implementation policies

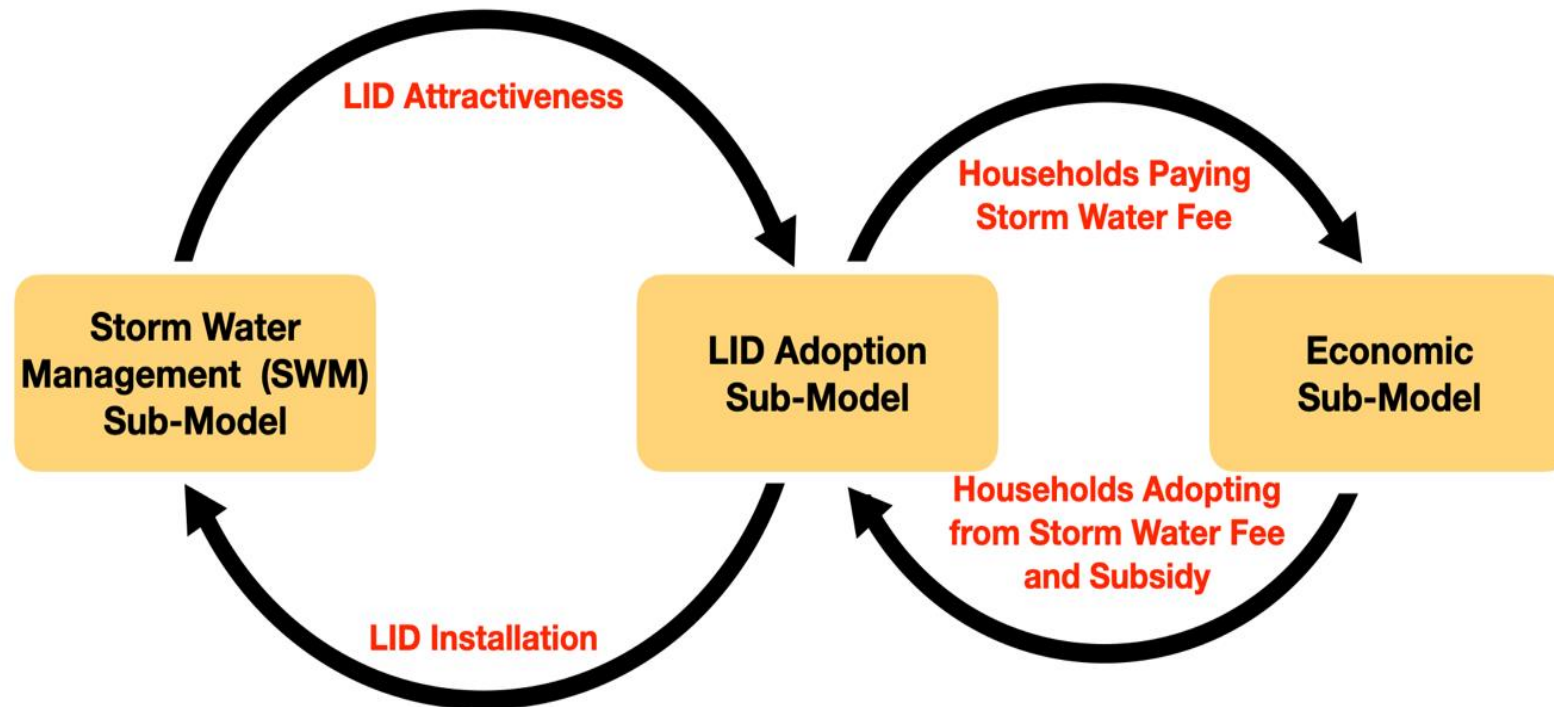


System dynamics modeling

- Policy implementation in a dynamic environment, feedback
- Integrating quantitative and qualitative data from across workpackages
 - fast (rain events) and slow (LID lifespans) variables
 - social, technical, and hydrological systems
- Focus on adoption of rain gardens



Model structure

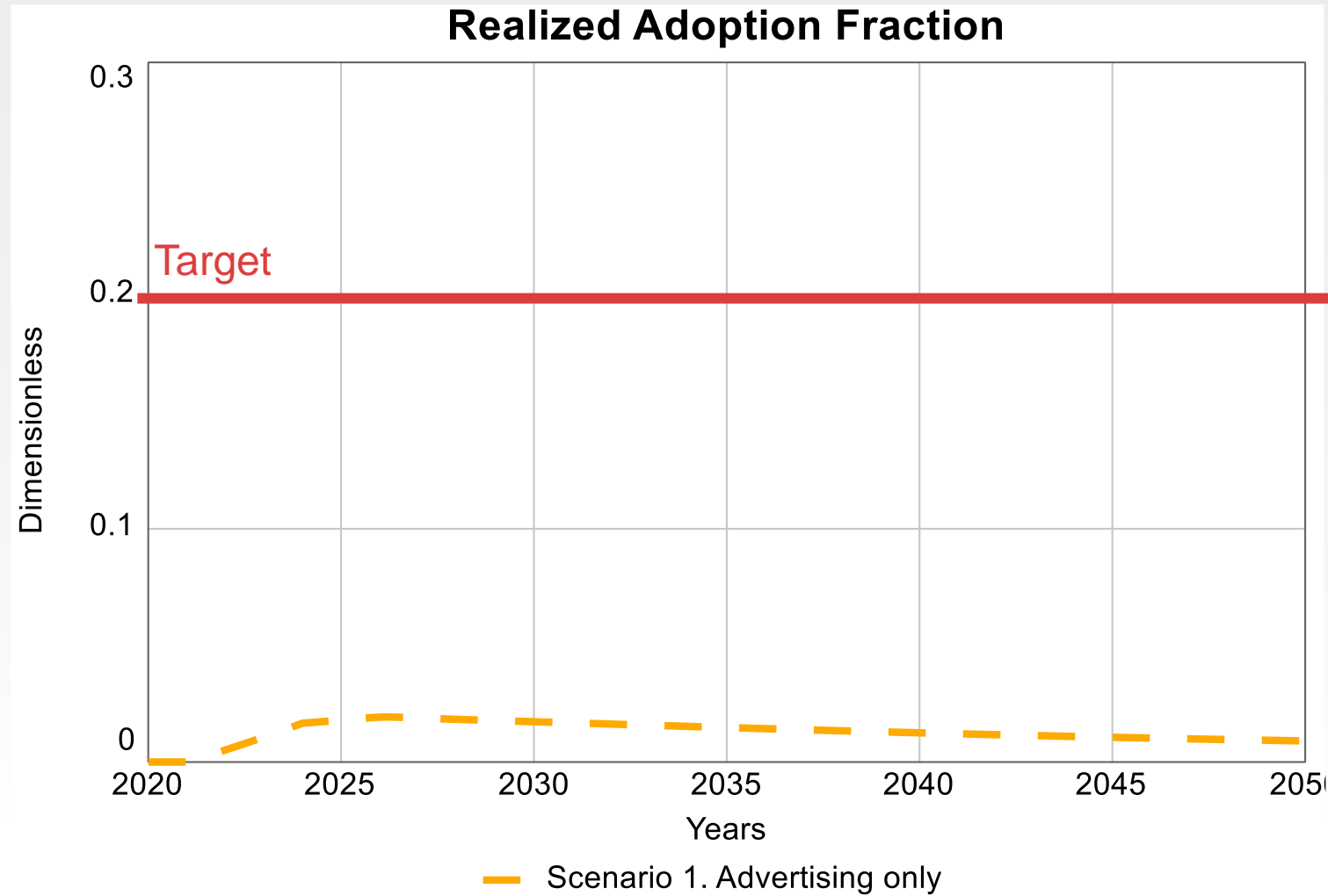


Scenarios

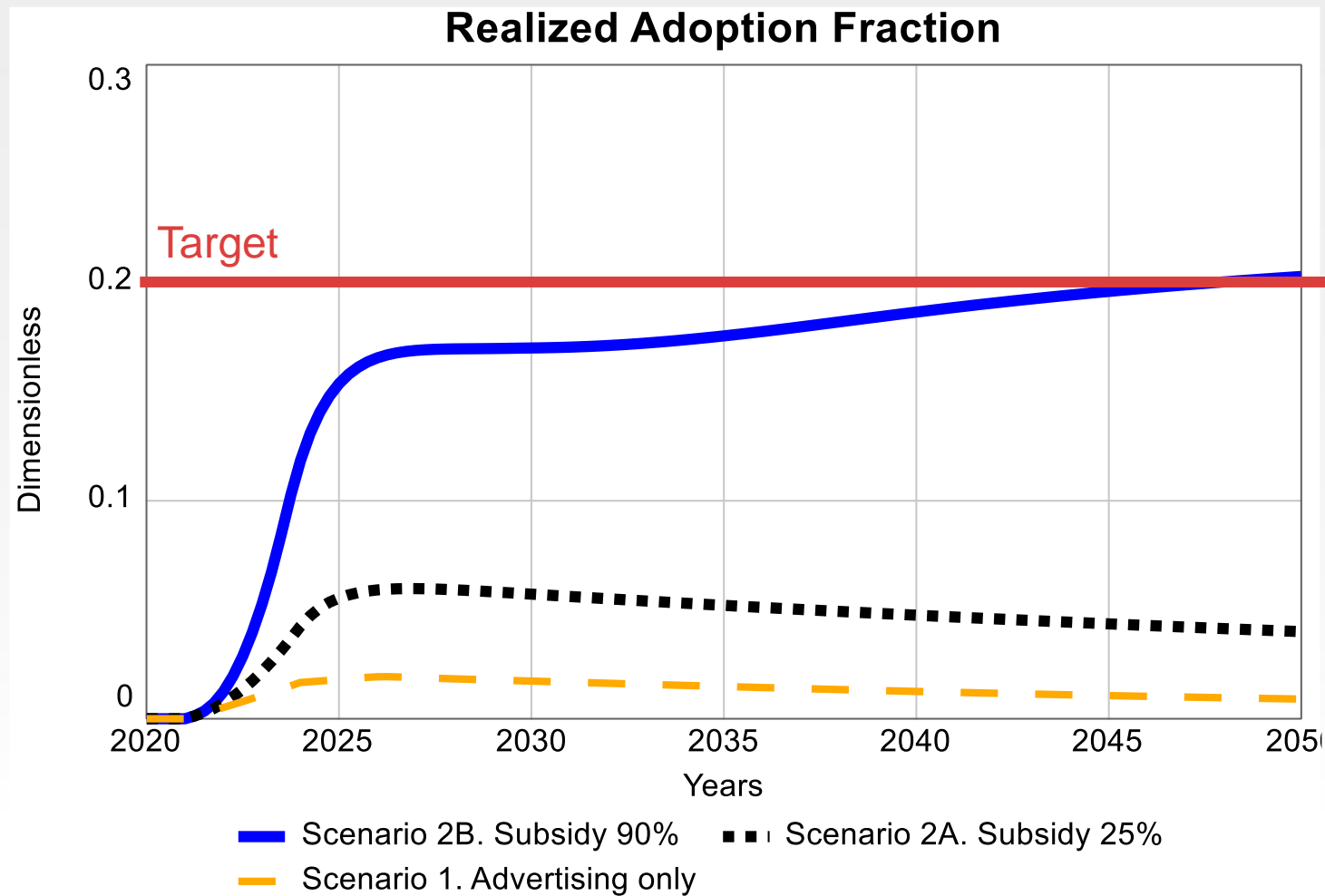
- Testing policies individually and together
- Assume target of 20% adoption (corresponds to ~100% of desired storage capacity from LIDs)



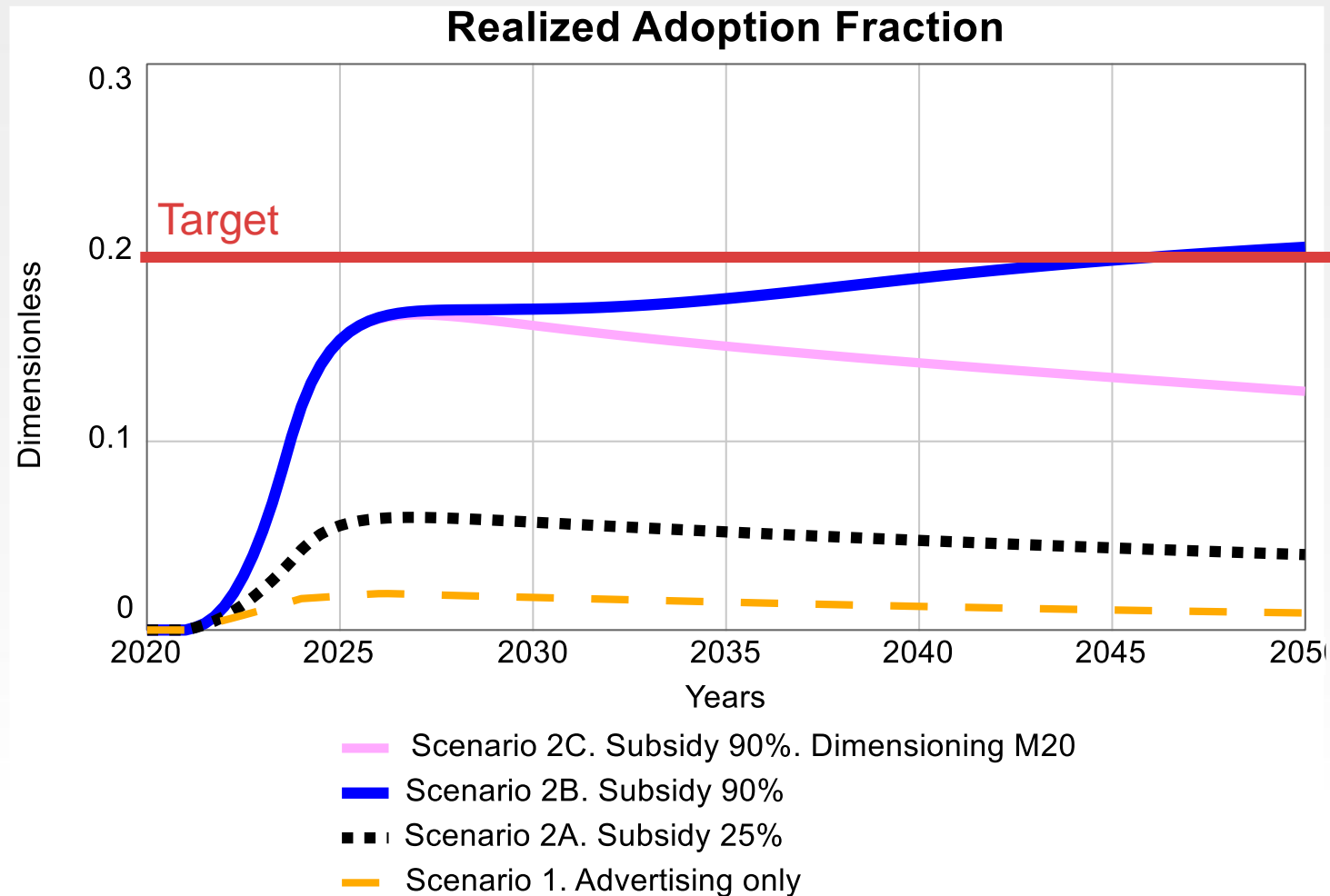
Advertising only



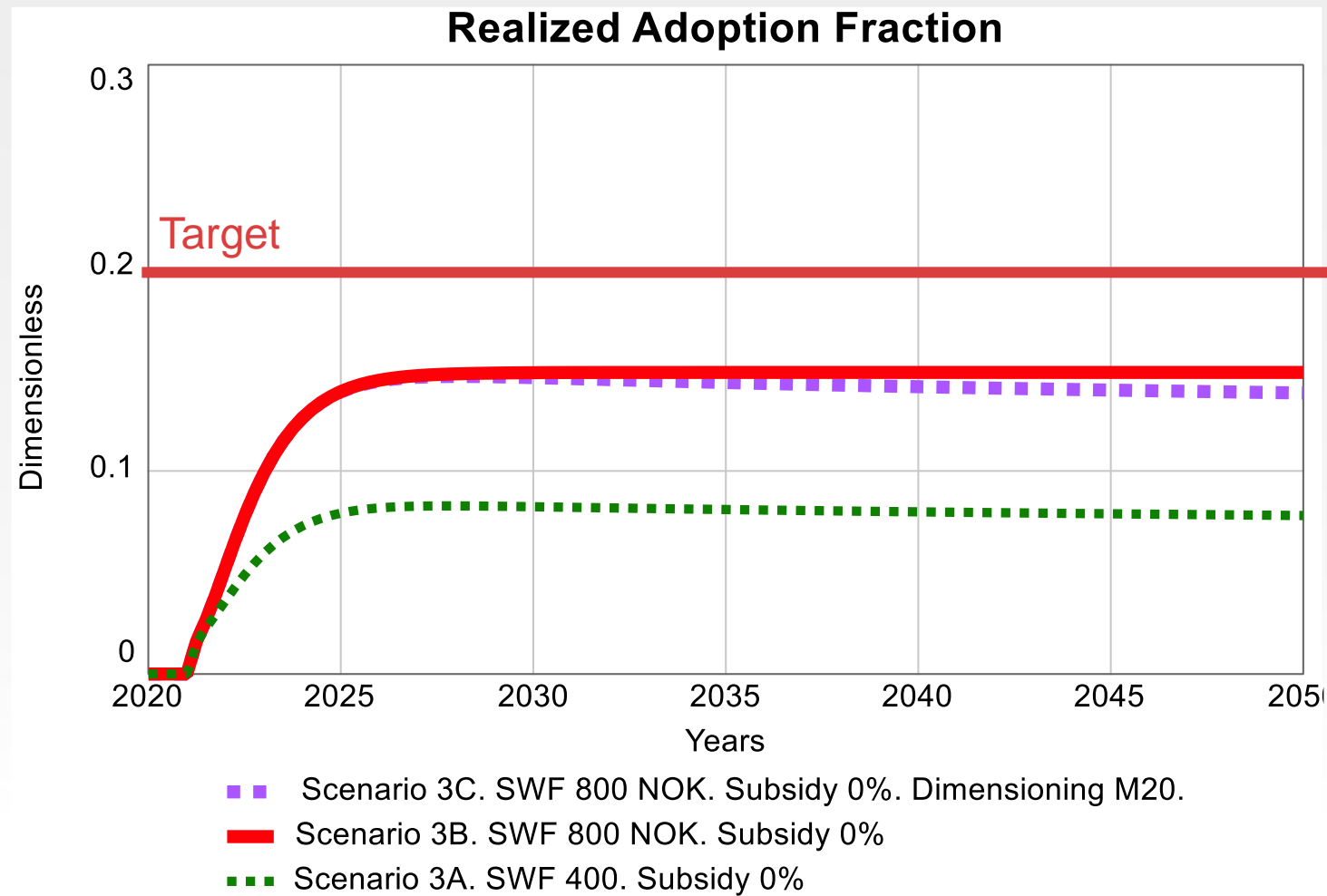
Reverse auction subsidy



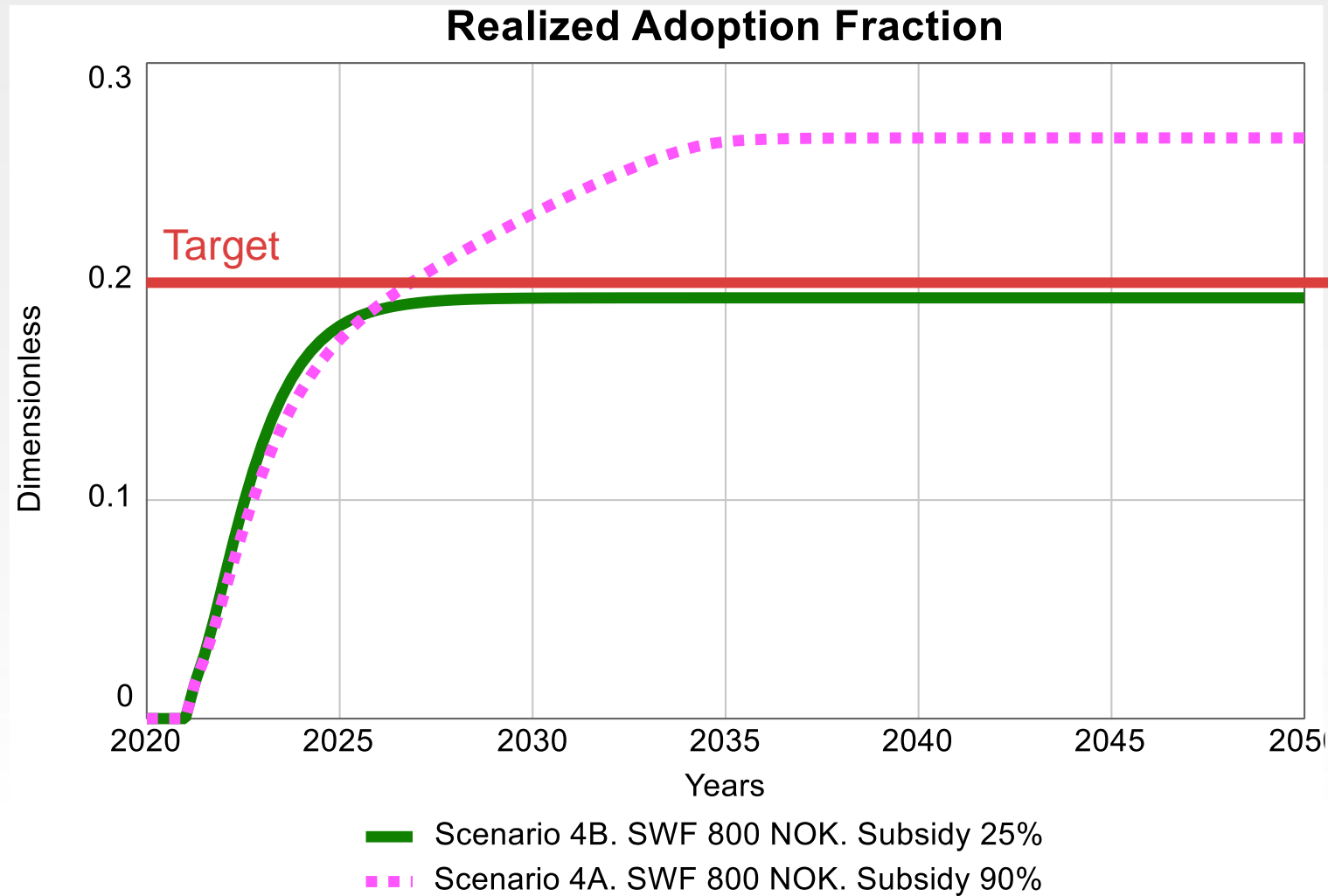
Reverse auction with 20 year rain



Stormwater fee



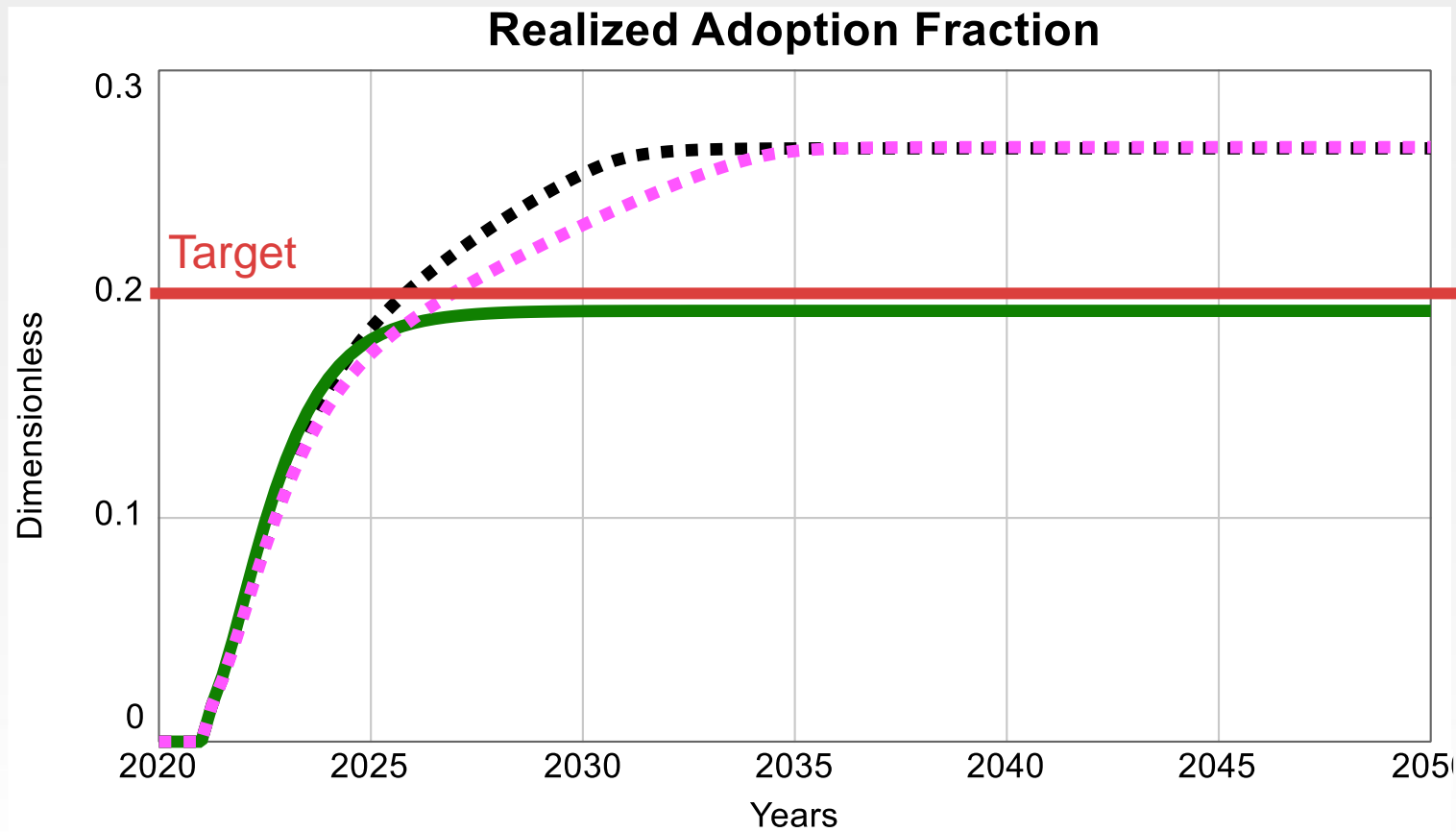
Combined policies



Funds from stormwater fee used for reverse auction



Combined policies

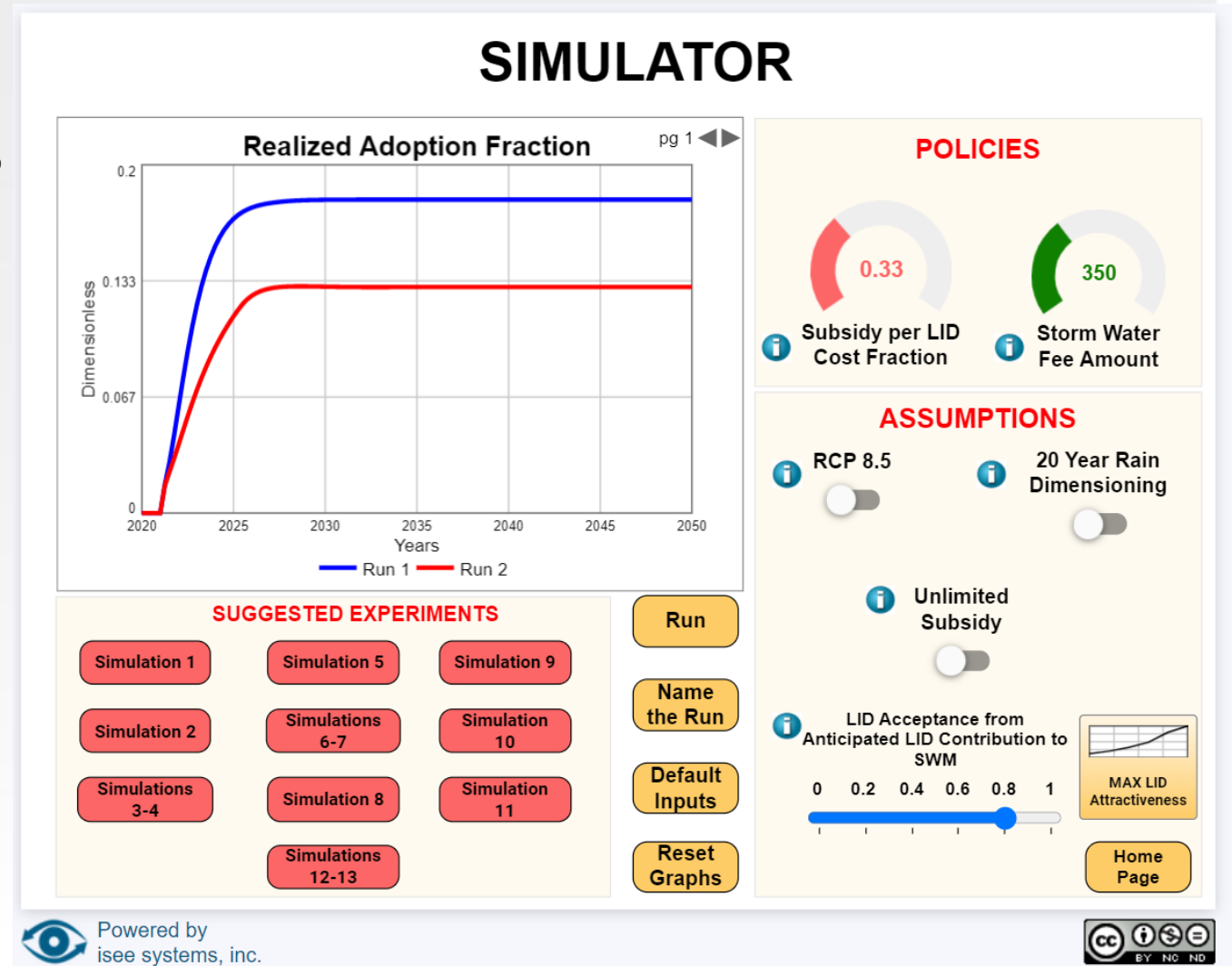


- ■ | Scenario 4C. SWF 800 NOK. Subsidy 67%
- Scenario 4B. SWF 800 NOK. Subsidy 25%
- ■ | Scenario 4A. SWF 800 NOK. Subsidy 90%



Interface

<https://exchange.iseesystems.com/public/eduardromanenk/o/integrative-dynamic-model-of-lid-implementation-in-a-built-up-area/index.html#page1>



Conclusion

- Advertising/awareness is not enough
- Reverse auction is effective, but can be costly
 - 90% subsidy to maintain 20% adoption
- Stormwater fee less sensitive to perceived effectiveness
- Moderate RA subsidies (67%) from SWF can facilitate faster adoption
- Larger rain events (20 year vs. 5 year return period) can result in lower perceived effectiveness of rain gardens
- Model for Grefsen-Kjelsås, can be modified for other areas

