Carbon footprint of implementing rainwater harvesting system in different building types

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Outline

Urban Water Management Practice and Issues

Alternatives and Research Needs

Methodology

Results and Discussions

Conclusion

Urban Water Management Practice

Is This Sustainable?

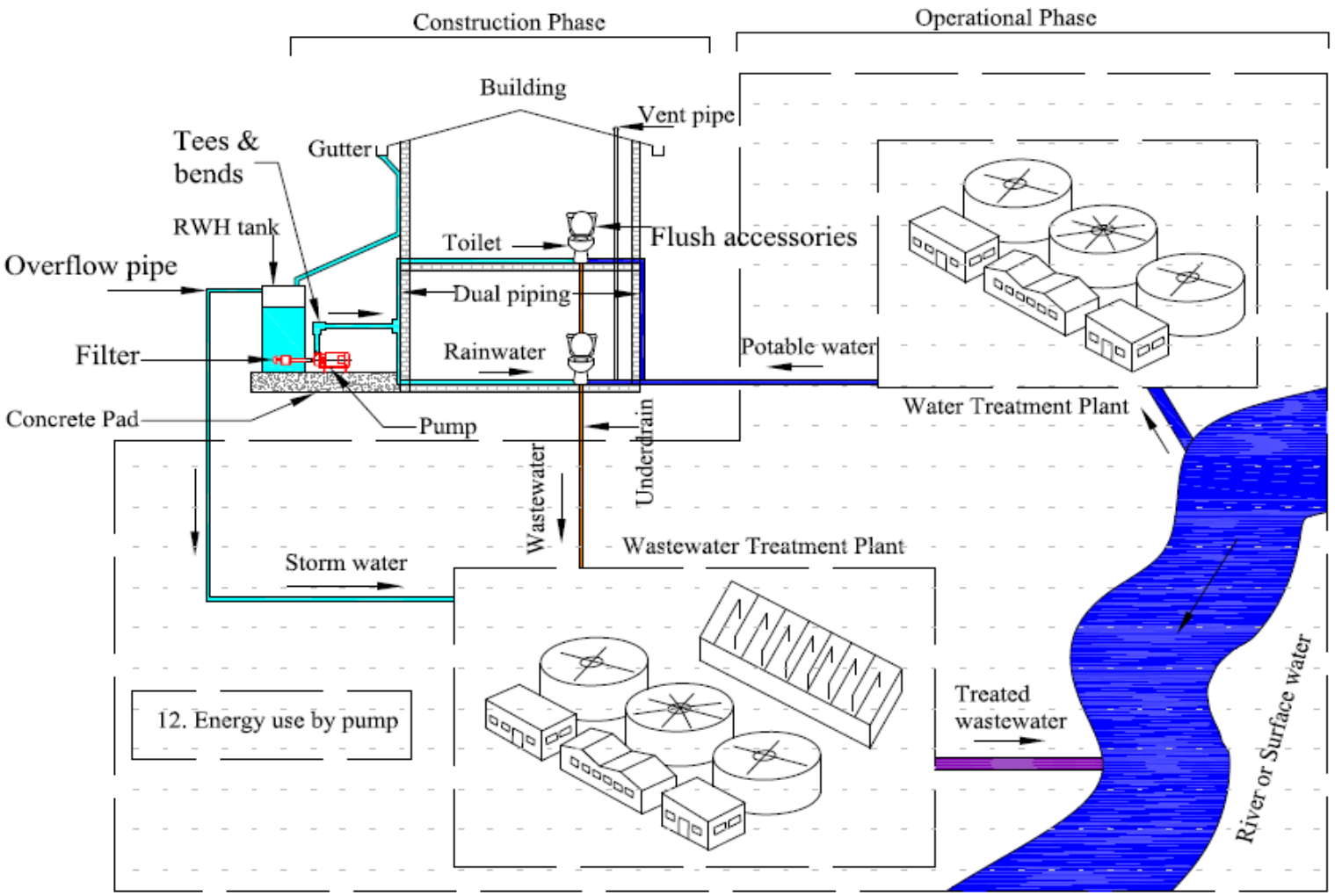
3.2 billion m3/year

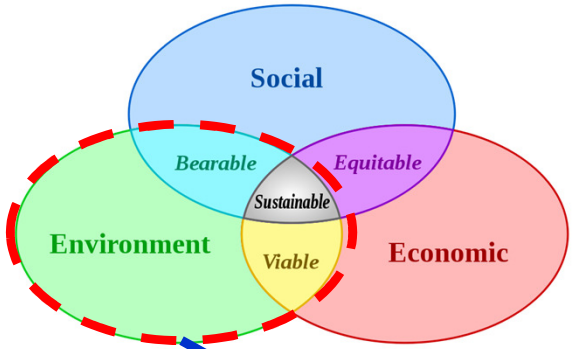
Water
Infrastructure

20%

Wastewater
Infrastructure

Alternative and Research Needs





Environmental Impact

Policy making

Research Needs

UTEngineering Complex
Building type: Educational

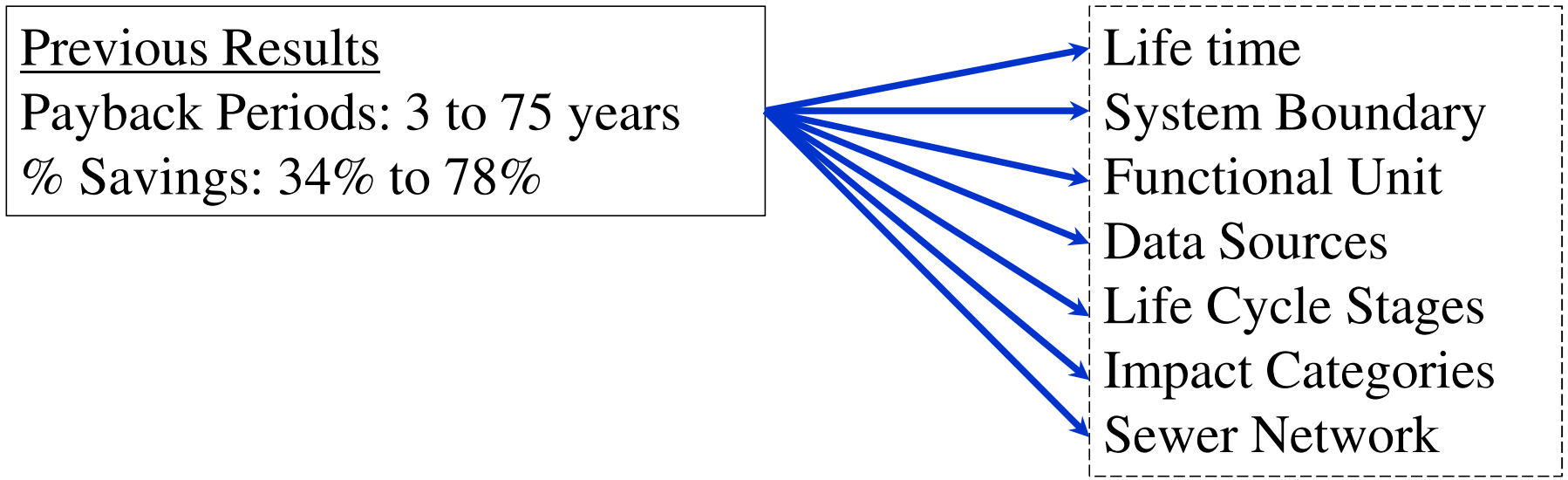
UTCrossings Building
Building type: Dormitory

Consulting Firm
Building type: Office

Others

- **1 Office**
- **9 Residential**
- **1 Gas Station**
- **2 Educational**

Objective



Goal is to provide a comprehensive synthesis of benefits of implementing RWH system in different building types in terms of water savings, energy consumption and greenhouse gas (GHG) emission using similar set of input parameters.

Methodology

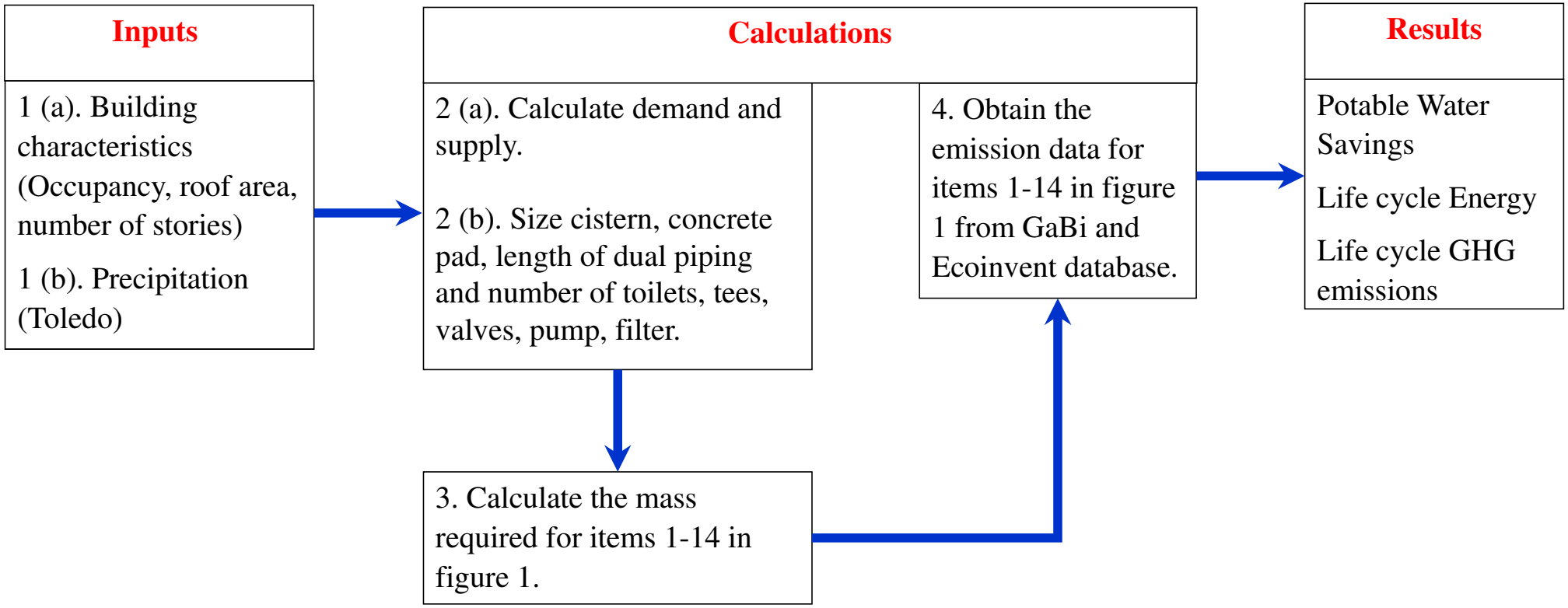
Department of Energy National Building Stock Database

Classification	Buildings
Commercial I	Small Office
	Medium Office
	Large Office
Commercial II	Stand-Alone Retail
	Strip Mall
	Supermarket
Commercial III	Quick Service Restaurant
	Full Service Restaurant
Residential	Small Hotel
	Large Hotel
	Midrise Apartment
Institutional	Primary School
	Secondary School
	Hospital
	Outpatient Healthcare

60%

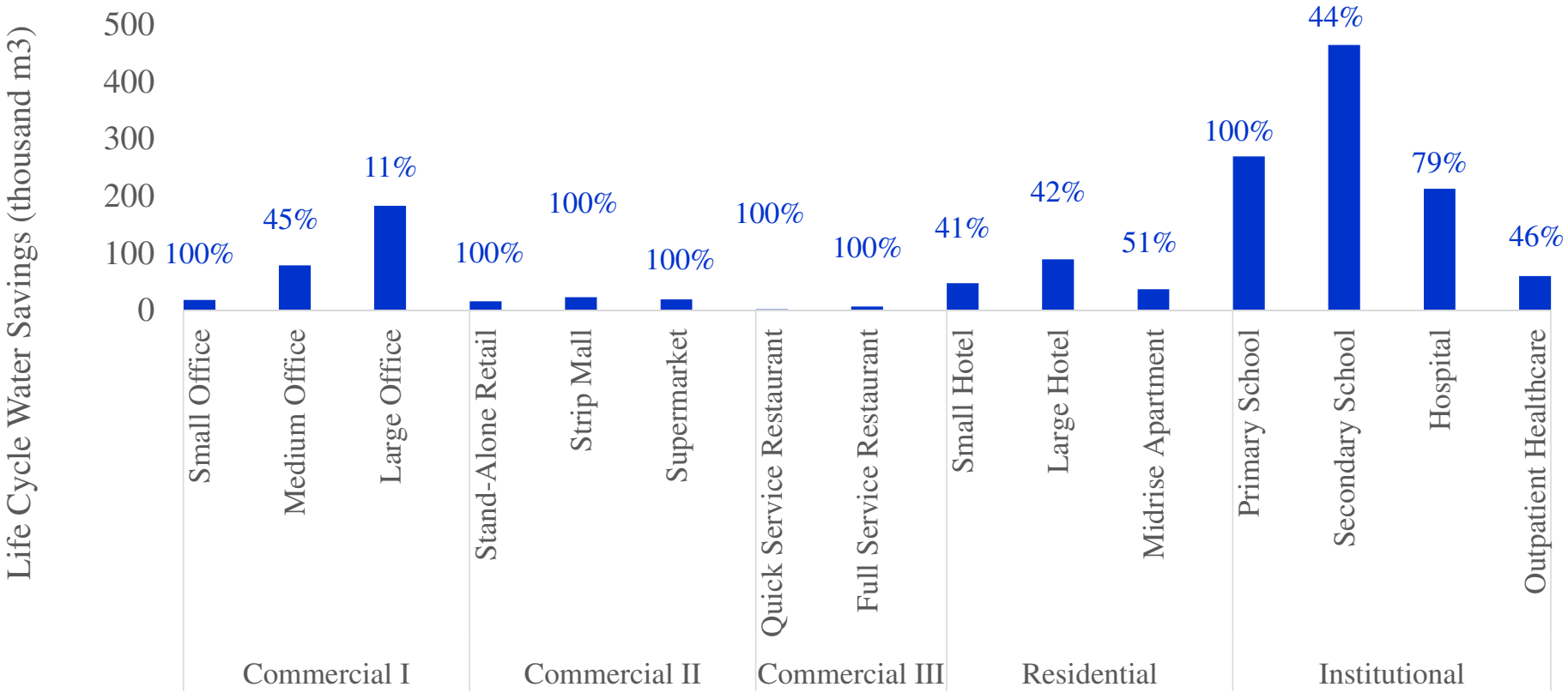
Methodology

Life Cycle Assessment (LCA)



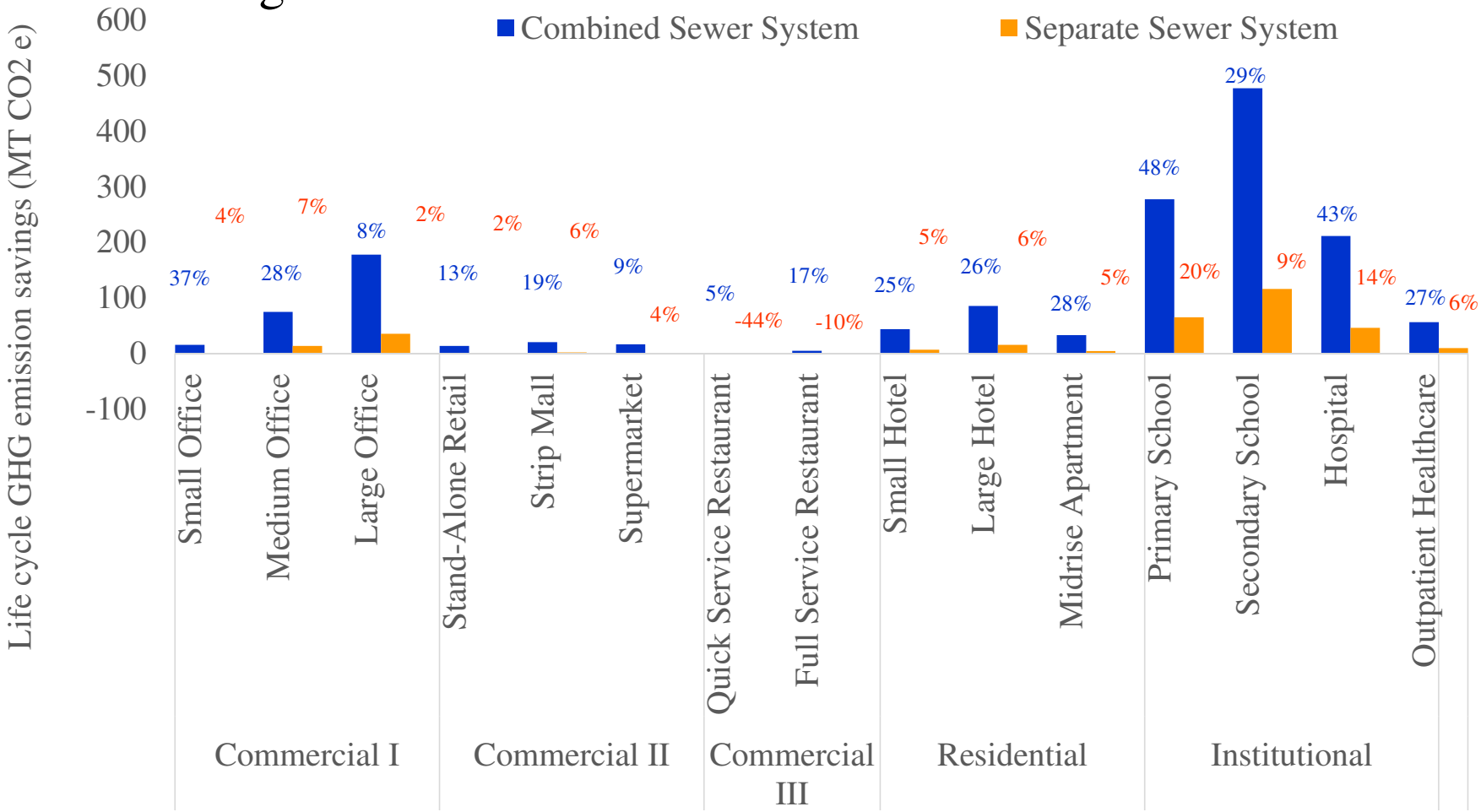
Results

Potable Water Savings



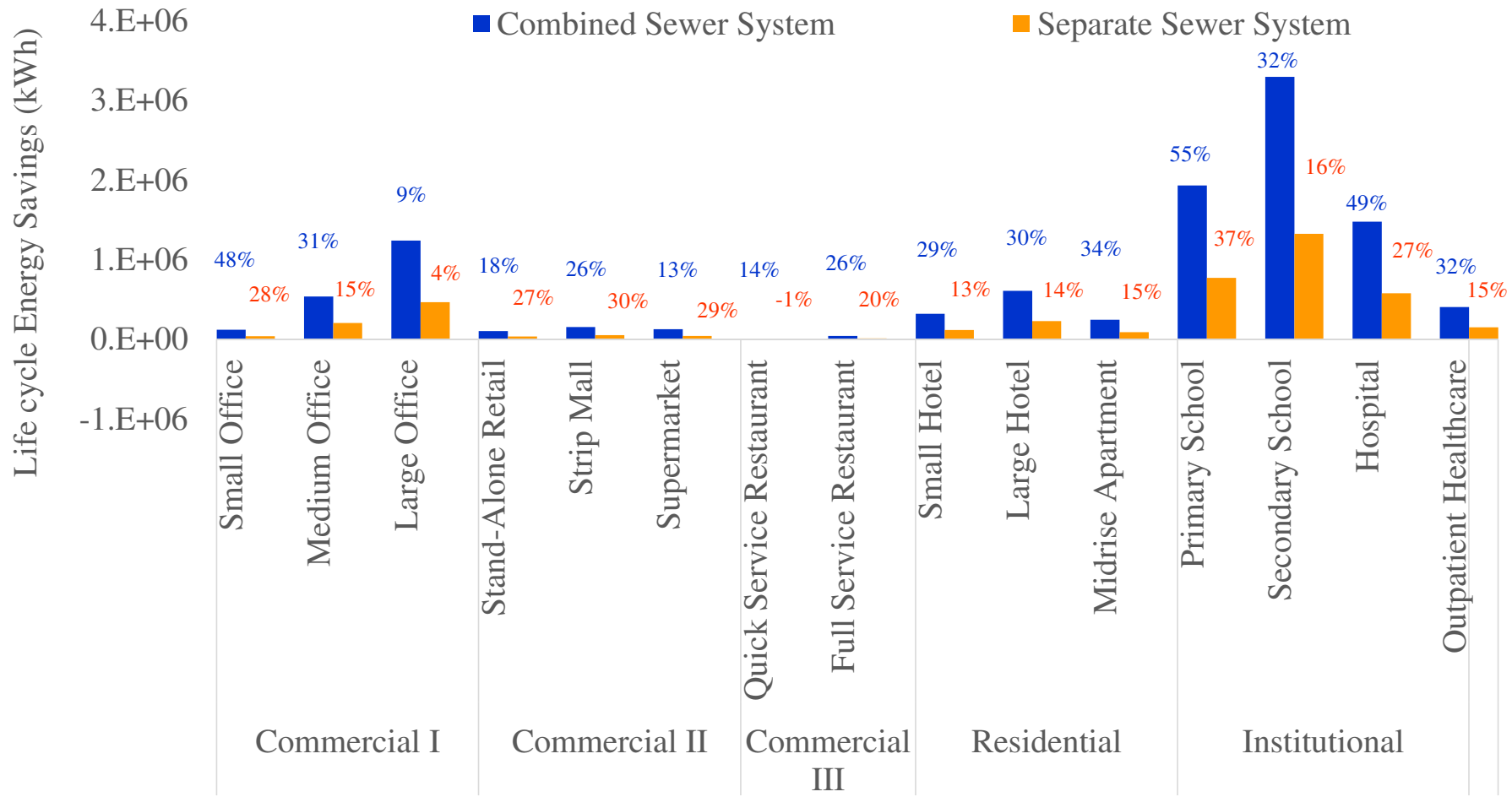
Results

GHG emission savings



Results

Energy savings



Conclusions

This is the first study to provide a synthesis of benefits of RWHS for wide range of buildings.

Though 100% water savings were achieved for commercial II and III types, highest water savings was achieved for institutional. (Similar to energy and GHG)

Building Connected to combined sewer networks are more environmentally attractive.

Secondary School, Primary School, Hospital and Large office are more attractive to implement RWHS (Commercial III types are not attractive).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