

BIPV Digitalization: Design Workflows and Methods

Task 15: Enabling Framework for the Development of BIPV

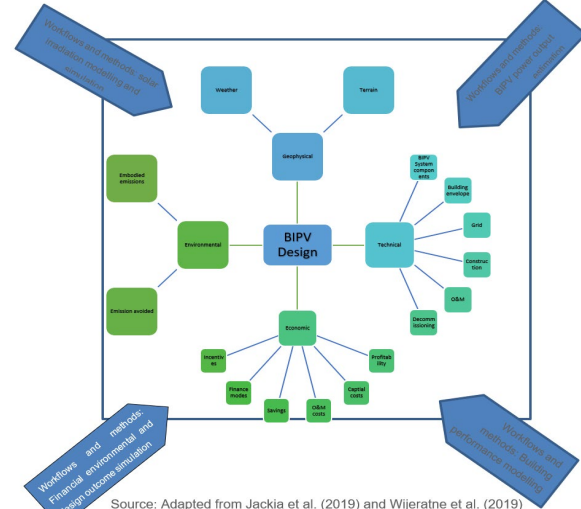
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Research Methodology



LITERATURE REVIEW

- The operative approaches, methods, and workflows relevant to each domain of BIPV design and integration:
 - a. Workflows and methods used in solar irradiation modelling and simulation
 - b. Workflows and methods used in solar power output modelling or simulation
 - c. Workflows and methods used in building performance modelling or simulation
 - d. Workflows and methods used in financial, environmental and design outcome

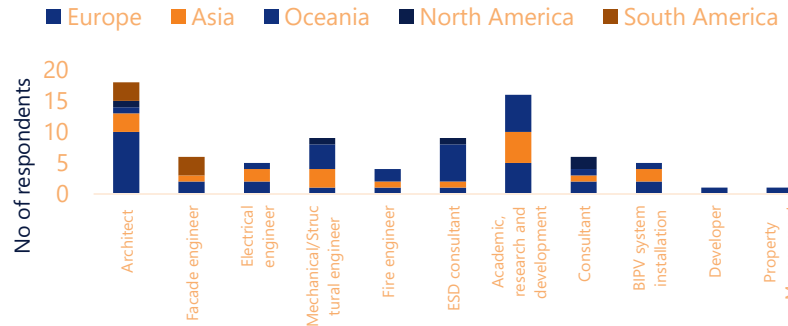
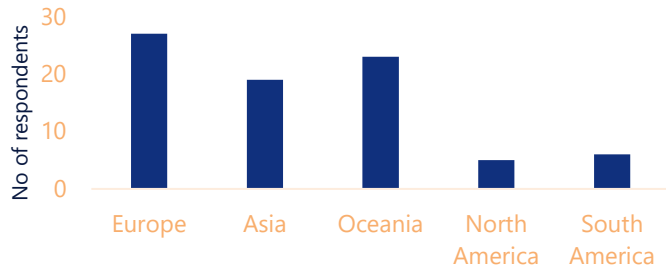


Source: Adapted from Jackia et al. (2019) and Wijeratne et al. (2019)
 Figure 4.1 Mapping of workflows and methods for BIPV design and simulation

QUESTIONNAIRE SURVEY

- 80 respondents in 10 professional groups

PVPS



Research Findings



- **Various methods and tools are available for BIPV-related solar irradiation modelling and simulation, power output modelling/simulation, building performance modelling/simulation and financial, environmental and design outcomes.**
- **Application of the identified methods vary based on the country and professional requirements.**
- **Further research is required to identify the methods that are more suitable for BIPV design and analysis:**
 - BIPV product database and system design documentation
 - Impact of micro, mezzo or macro shading on BIPV power output
 - Embodied Energy in BIPV
 - BIPV design and analysis in relation to the customer requirements such as aesthetical, cost and energy output of BIPV designs to understand how building owners, designers, and policymakers should adopt BIPV applications.
 - Decision support models
 - Impact of BIPV in the urban context

Rebecca Yang, Task 15

Rebecca.yang@rmit.edu.au

