

# Financing Green Buildings

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## ABSTRACT

This paper makes a review of the literature and provides a pathway for financing green buildings, particularly in developing countries. To reach net-zero carbon emission and other nationally determined contributions, construction, and building sectors have a tremendous role, thereby providing opportunities for investment in construction, buildings, and allied sectors.

**Keywords:** GHG emission, Green building, Construction, Green bond, Green construction material, Green finance

## 1. INTRODUCTION

Asia and the Pacific is currently responsible for over 50% of global greenhouse gas emissions [1]. Decarbonizing the building sector is important not only for reaching Nationally Determined Contributions and net-zero emission targets, but also for making cities more livable. Many large cities in developing Asia suffer from high levels of air pollution, especially in winter, which has a negative impact on life expectancy, health, and quality of life.

Furthermore, buildings consume about 30% (22% from residential & 8% from non-residential building) of the total energy and contributes to about 28% (17% from residential & 11% from non-residential building) of the GHG emission (Figure 1) [2]. Building construction industries also consume 5% of energy and contribute to 10% of the GHG emission. It is alarming that the building material-related emissions alone is projected to rise by 3.5 to 4.6 Gt CO<sub>2</sub>eq per year from 2020 to 2060 coming from developing countries [3].

## 2. FINANCING OF GREEN BUILDINGS

### 2.1 Green bonds

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Green bonds are fixed income financial instruments

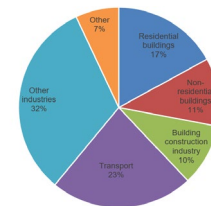


Fig. 1. GHG emissions

used to fund projects that have positive environmental and/or climate benefits. The issuer commits to use proceeds only for 'green projects' with clear environmental benefits. Labelling provides a guarantee that proceeds will be used only to fund Green Projects. The global issuance of green bonds increased from \$4 bn in 2010 to \$275 bn in 2020, and to \$600 bn in 2021 (Figure 2) [4].

Green Bond mostly finance Green Buildings & Energy. Interestingly that nearly half (43%) of green bonds proceeds were used for financing green buildings in Southeast Asia comparing to 1/5 globally [5].

Green bonds allow to attract investments from many countries. The main drawback of green bonds are: (i) the cost of labeling bonds 'green', which include cost of external reviewers; (ii) local currency exchange risks when issued in foreign currency, most common currencies for green bonds are USD and EURO (70% of green bonds are issued EURO (45%) and USD (26%)), while revenue flow is often in local currencies (except for cases when feed-in tariffs are set in foreign currency); (iii) uncertain demand especially for issuers with low ranking (Moody's rating) and first time issuers. These barriers are particularly relevant for developing Asia. Due to the above barriers for issuing green bonds some countries provide policy support for issuing green bonds. Green bond issuance is supported by the following policies: green bond standards, green bond grants, tax incentives,

public issuance of green bonds [6]. Such policy support was particularly popular in Asia, including Hong-Kong, Malaysia, Indonesia, and Singapore.

## 2.2 Green Islamic Bond

Popular policies to promote green buildings include codes and standards, tax incentives, grants and subsidies, loans, public investment and procurement, and strategic plans.

Energy efficiency policies/financing are not an equal

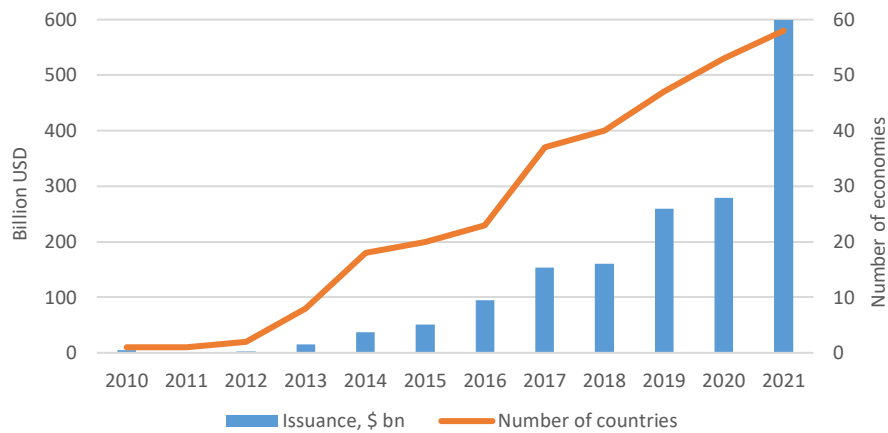


Fig. 2. Green bond issuance (annual)

Similar to green bonds, green Islamic bonds, i.e., green sukuk, were also used for financing green buildings. Similar to green bonds, proceeds of green sukuk can be used to fund environment-friendly projects, but unlike green bonds, green sukuk is a Shariah-compliant financial instrument. Proceeds are used to purchase an asset, which the investor partially owns. Investors receive a share of the profit generated by the asset instead of interest payments. The issuer promises to buy back the instrument at a future date at par value. Green sukuk has two labels: “Islamic” and “Green” [7-8]. Sukuk issuing countries started to label Sukuk as ‘green’ in 2017. Tobacco and alcohol cannot be sold in green buildings financed using green sukuk. Green sukuk is mainly issued by Malaysia, Indonesia, UAE and Saudi Arabia.

## 3. CONCLUSION AND POLICY IMPLICATIONS

Green buildings can help with meeting NDCs, reducing air pollution and energy security in sectors of manufacturing of building material, building construction and building operation. However, there are several challenges to financing green buildings in developing countries.

Green bonds can be used for attracting investments (locally and from abroad) and can be promoted by subsidizing the cost of labeling bonds ‘green’ and supporting local demand for green bonds

substitute for green building policies/financing as they do not cover manufacturing of construction material and building construction.

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