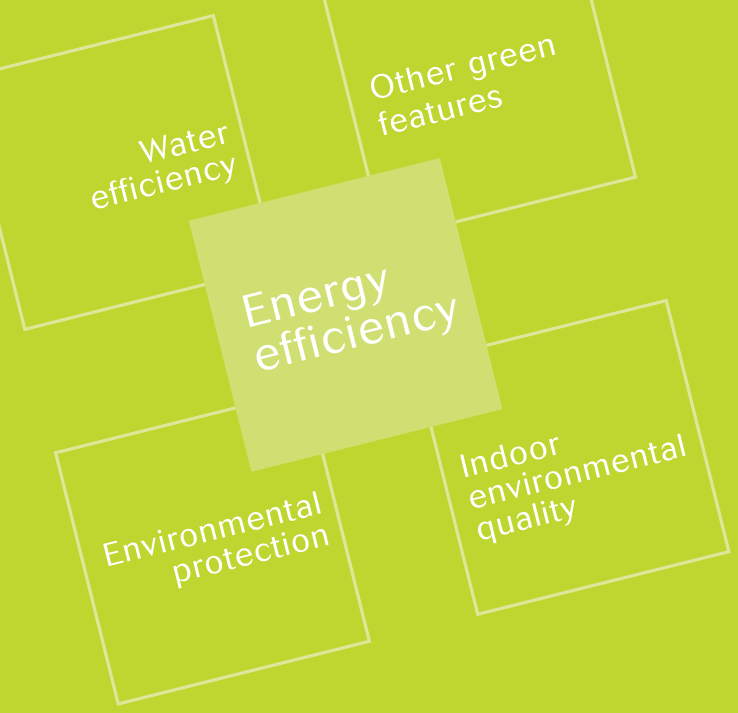
2nd GREEN BUILDING MASTERPLAN

Building and Construction Authority

We shape a **safe**, **high quality**, **sustainable** and **friendly** built environment.

BCA GREEN MARK



ABOUT THE BCA GREEN MARK SCHEME

BCA GREEN MARK

The BCA Green Mark Scheme was launched in January 2005. This green building rating system promotes the adoption of green building design and technologies that improve energy efficiency and reduce the impact of buildings on the environment. Under the BCA Green Mark Scheme, buildings are assessed for energy and water efficiency, indoor environmental quality and environmental protection.

The Criteria

The BCA Green Mark Scheme rates buildings according to five key criteria. They are:

- Energy efficiency
- Water efficiency
- Environmental protection
- Indoor environmental quality, and
- Other green and innovative features that contribute to better building performance.

Based on an overall assessment, a building will be awarded one of four Green Mark ratings: the Green Mark Certified, Gold, Gold^{Plus} or Platinum Award. Both new and existing buildings are eligible to be enrolled in the scheme.

Green Mark buildings contribute significantly to the environment. A Green Mark Platinum building, for instance, can achieve more than 30% energy savings compared to a code-compliant building.

BCA Green Mark Schemes

Since its creation, the BCA Green Mark Scheme has evolved.

Today, the BCA Green Mark Scheme is not just applied to individual buildings. It is also deployed to promote environmental sustainability in parks, office interiors and supporting infrastructure.

In May 2008, for instance, BCA and the National Parks Board (NParks) jointly launched the BCA/NParks Green Mark for Parks Scheme. This scheme aims to inspire, recognise and evaluate environmentally friendly as well as sustainable practices and features in existing parks. By looking at sustainability beyond buildings, the nation will be able to work towards fully achieving a high-performing and resource-efficient built environment, bringing us closer to our dream to make this island a sustainable and highly liveable city.

BCA Green Mark Schemes For New Buildings

- BCA Green Mark for Non-Residential Buildings
- BCA Green Mark for Residential Buildings
- BCA Green Mark for Landed Houses

BCA Green Mark Schemes For Existing Buildings

- BCA Green Mark for Non-Residential Buildings
- BCA Green Mark for Residential Buildings (under development)

BCA Green Mark Schemes – Beyond Buildings

- BCA/NParks Green Mark for Existing Parks
- BCA/NParks Green Mark for New Parks Design And Development (under development)
- BCA Green Mark for Office Interiors
- BCA Green Mark for Infrastructures

THE BEGINNING OF IT ALL: 1st GREEN BUILDING MASTERPLAN

The Singapore government first took the lead to promote environmental sustainability in buildings by launching the BCA Green Mark Scheme in 2005. This green building rating system is developed and managed by the Building and Construction Authority (BCA). It forms the backbone of Singapore's 1st Green Building Masterplan unveiled in 2006. This masterplan comprised the following initiatives:

Spurring the private sector

To spur the private sector towards realising green buildings, the BCA introduced in December 2006 a S$20 million Green Mark Incentive Scheme. This scheme offers direct monetary incentives to developers that achieve a green building rating above the basic Certified level.

Imposing minimum standards on environmental sustainability for buildings

Also, in April 2008, the Building Control Act was amended so that minimum standards are now imposed on environmental sustainability for buildings. This brought standards for all new buildings to a level that is on par with the Green Mark Certified standard.

Promoting research and development in environmental sustainability

Further, the Ministry of National Development launched a S$50 million R&D Research Fund to encourage research into developing more viable and cost-effective green building technologies and energy efficiency solutions. The scheme has proven fruitful. To date, a total of 49 proposals have been accepted and funding of S$32 million distributed. Among the key projects is BCA's flagship R&D project called the Zero Energy Building. This joint BCA-NUS research project involving the retrofitting of an existing building at the BCA Academy will be launched in October 2009.

Building up industry capability

To grow the capability of the building industry in the areas of the design and operation of green buildings, the BCA Academy launched a training and certification scheme for green building specialists. This saw the creation of two training courses called the Green Mark Manager and Green Mark Professional Course. More than 800 executives have signed up for the courses.

The SECOND GREEN WAVE: THE BCA 2nd GREEN BUILDING MASTERPLAN

For Singapore, sustainable development remains a key national priority going forward. An Inter-Ministerial Committee on Sustainable Development (IMCSD), set up to chart the nation's future national sustainability strategies, recently released its green plan for Singapore for the next 20 years. This plan ultimately aims to make Singapore a lively yet highly liveable global city.

To achieve this, the IMCSD set a lofty target for Singapore's built environment: To have at least 80% of the buildings in Singapore attain the BCA Green Mark Certified rating by 2030.

To realise this vision, BCA recently launched the 2nd Green Building Masterplan, a roadmap that sets out specific initiatives to achieve a truly sustainable built environment in Singapore by 2030.

In formulating the 2nd Green Building Masterplan, BCA carried out extensive reviews and discussions with public agencies, the industry and research institutes. An International Panel of Experts on Sustainability of the Built Environment was also formed to review the proposed initiatives under the 2nd Green Building Masterplan, as well as chart new directions to shape a sustainable built environment in Singapore.

In its review, the International Panel of Experts endorsed wholeheartedly BCA's plans to take a strong lead to promote a strong business case for green buildings and drive the industry towards shaping a sustainable built environment on the island. It also lauded the results achieved thus far and pointed out the need to focus on greening existing buildings.

With the 2nd Green Building Masterplan, BCA will continue to champion a proactive and holistic approach to tackling challenges such as the 'greening' of our existing building stock and the building of industry capabilities, in order to realise our vision of the best built environment for Singapore, our distinctive global city.

The key initiatives to be launched are:

New public sector buildings to achieve Green Mark Platinum rating

Under the 1st Green Building Masterplan, all new public sector buildings and those undergoing major retrofitting works had to meet minimum standards of environmental sustainability equivalent to the Green Mark Certified level. Under the 2nd Green Building Masterplan, the government plans to demonstrate its continued commitment towards realising a sustainable built environment by requiring all larger new air-conditioned public sector buildings to achieve the highest Green Mark accolade, the Green Mark Platinum Award.

Land sales conditions in key growth areas to achieve higher Green Mark ratings

To further encourage private developers to achieve outstanding design, quality and sustainability objectives in their projects, the government will set higher Green Mark standards, such as the Green Mark Platinum or Green Mark Gold^{Plus} Award as land sales conditions for selected new growth areas. This will ensure that these new developments are outstanding green buildings projects, excellent in quality and distinctive.

Existing public sector buildings to achieve Green Mark Gold^{Plus} Award by 2020

The government will lead the movement to 'green' existing building stock on the island by requiring that all existing buildings owned by government agencies meet Green Mark Gold^{Plus} standard by 2020.

Bonus to further encourage developers to achieve higher-tier Green Mark ratings

Heartened by the strong response from private developers to the existing S$20 million Green Mark Incentive Scheme for New Buildings, or GMIS(NB), BCA and URA have launched a new scheme called the Green Mark Gross Floor Area (GM GFA) Incentive Scheme. This scheme awards additional gross floor area to developers that earn higher-tier Green Mark awards for their new buildings and reconstruction projects.

S$100 million scheme for building owners to retrofit

BCA recognises that financial considerations can be a key concern for building owners considering the upgrading of the energy performance of their building. To jump-start the 'greening' of existing buildings in the private sector, BCA is introducing a bold scheme called the S$100 million Green Mark Incentive Scheme for Existing Buildings (GMIS-EB). This cash incentive scheme aims to encourage private building owners of existing buildings to undertake retrofits to achieve significant improvement in energy efficiency.

Strategic Thrust 3
Furthering The Development Of Green Building Technology

It is essential to step up developmental and collaborative efforts to build up capabilities and expertise in green building design and technologies. This will eventually lead the way to more viable and cost-effective applications of green building designs and technologies. The upcoming Zero Energy Building project will be a useful platform to testbed and showcase new technologies and designs for the built environment. In addition, BCA will also be collaborating with suitable partners to embark on R&D and pilot projects that can lead to even greater energy savings of 50% or more.

Strategic Thrust 4
Building Industry Capabilities Through Training

To meet the expected strong demand for green buildings, it is important to develop the industry's capabilities and ensure an adequate supply of green building professionals. BCA has worked out a comprehensive training framework to train some 18,000 green specialists at the PMET (Professional, Manager, Executive And Technician) level over the next 10 years in the development, design, construction, operation and maintenance of green buildings. Existing personnel will need to be upgraded and new entrants recruited, creating a highly skilled 'green collar' workforce.

Strategic Thrust 5
Profiling Singapore And Raising Awareness

It is important to elevate awareness of green buildings, energy efficiency and the need for a sustainable built environment within the industry and the community.

We will be profiling Singapore as a hub for green building development in the region. The Singapore Green Building Week to be launched in October 2009 will feature the International Green Building Conference, to showcase Singapore's achievements in shaping a sustainable built environment. It will draw foreign and local experts to share their experiences in green building science. We will also officially launch our Zero Energy Building and generate greater international awareness of Singapore's iconic Green Mark projects with the Green Mark Tours.

Strategic Thrust 6
Imposing Minimum Standards

The sixth strategic thrust focuses on the need for regulation. After studying the approaches to implementation taken by countries such as Germany, Denmark and the United Kingdom, BCA has mapped out a phased approach to tackle the challenge of "greening" existing buildings. We will start by exploring the feasibility of requiring energy consumption disclosure by building owners. This will help establish energy benchmarks for various categories of buildings.

Incentive Schemes Offered By BCA

The Green Mark Gross Floor Area (GM GFA) Incentive Scheme

BCA and the Urban Redevelopment Authority jointly launched the Green Mark Gross Floor Area (GM GFA) Incentive Scheme on 29 April 2009 to encourage the private sector to work towards achieving higher-tier Green Mark ratings such as the Green Mark Platinum or Green Mark Gold^{Plus} Award.

The scheme will grant developments that achieve either the Green Mark Platinum or Green Mark Gold^{Plus} Award with additional gross floor area over and above the Master Plan Gross Plot Ratio (GPR) control. Developments that obtained the Green Mark Platinum rating will earn an additional gross floor area up to 2% of the individual development's total gross floor area, subject to a cap of 5,000 square metres. Developments that obtained the Green Mark Gold^{Plus} rating will earn an additional gross floor area up to 1% of the individual development's total gross floor area, subject to a cap of 2,500 square metres. The scheme will apply to all new private developments, redevelopments, and major A&A developments submitted on or after 29 April 2009. Developments that have already obtained planning approval but have not commenced construction of the superstructure work on site may also be considered for the scheme.

The Green Mark Incentive Scheme For Existing Buildings (GMIS-EB)

Recognising that building owners are often deterred from upgrading the energy performance of their buildings because of the considerable financial expenditure involved, BCA unveiled on 29 April 2009 a S$100 million Green Mark Incentive Scheme for Existing Buildings to jump-start the 'greening' of existing buildings in the private sector.

The scheme will co-fund up to 35% of the retrofitting cost for energy improvements, or up to S$1.5 million, whichever is lower.

The scheme applies to existing non-residential developments with gross floor area of 2,000 square metres and above. Other energy-intensive buildings such as privately owned hospitals and institutions may also be eligible for the scheme.

The Green Mark Incentive Scheme For New Buildings (GMIS-NB)

In 2006, the government established a S$20 million Green Mark Incentive Scheme For New Buildings. The scheme offers cash incentives to private developers, building owners and project consultants (such as architects and M&E engineers) whose new development with a gross floor area of at least 2,000 square metres achieves a Green Mark Gold rating or higher.

The scheme co-funds up to S$3 million of cost for private developers and building owners. For architects and M&E engineers involved in both public and private developments, the scheme offers an incentive of up to S$100,000 each.

Incentive Schemes Available

Summary Of Eligibility Under BCA Green Mark Incentive Schemes

Incentive Schemes	New Building Developer/Owner	Existing Building Developer/Owner
GM GFA	✓	✓ 1
GMIS-EB		✓ 2
GMIS-NB	✓ 3	

Note 1: Major A&A and retrofitting of existing buildings may be considered for the GM GFA Incentive Scheme. The retrofitted development must come in for GM Assessment Criteria under New Buildings for the assessment of the entire development.

Note 2: Developers/owners who take up the GM GFA Incentive Scheme will not be eligible for the Green Mark Incentive Scheme (GMIS)

Note 3: The incentive is also extended to architects and M&E engineers in both private and public developments. With effect from 14 December 2009, the GMIS-NB Scheme for developers and building owners will come to an end. However the existing incentives for consultants will be reviewed for possible extension after 14 December 2009.

For more details on the schemes, please refer to the following web links:

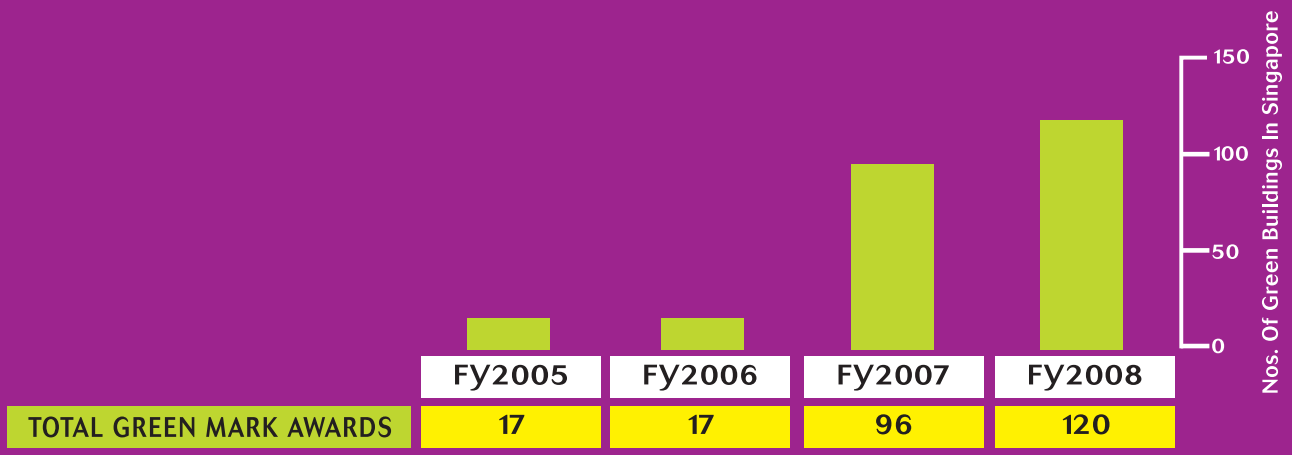
For GM GFA: www.bca.gov.sg/greenmark/gmgfa.html

For GMIS-EB: www.bca.gov.sg/greenmark/gmiseb.html

For GMIS-NB: www.bca.gov.sg/greenmark/gmis.html

For any queries on the schemes, please call 6325 5400
or email us at: bca_enquiry@bca.gov.sg

Success Of BCA Green Mark



More than 250 Green Mark Projects In Singapore

GREEN Courses at BCA Academy

The BCA Academy offers a comprehensive training framework designed to nurture a core group of green building professionals and specialists.

The framework provides flexibility for practitioners, who are empowered to seek out the best route to acquiring knowledge and qualifications at various stages of their careers.

Above all, this framework allows for a more holistic approach towards building up the industry's capability in the design of green building systems as well as in downstream construction and the maintenance of green buildings.

Executive Programmes

BCA provides for executive programmes that equip senior executives with leadership skills in sustainable development to strategically drive their organisations for growth and competitiveness in both the local and international markets.

The executive programmes are:

- Leadership in Environmental Sustainability (in collaboration with Carnegie Mellon University)
- Leadership in Green Building - Lecture Series (in collaboration with Autodesk Asia Pte Ltd)

Academic Programmes

BCA offers academic programmes designed to facilitate the career advancements of green professionals through clear and defined academic progression paths.

These programmes include:

Postgraduate Programme

- Master of Science in Sustainable Building Design (in collaboration with the University of Nottingham)

Specialist Diploma Programmes

- Specialist Diploma in M&E Coordination
- Specialist Diploma in Facility And Energy Management

Diploma Programmes

- Diploma in Mechanical Engineering (Green Building Technology)
- Diploma in Strategic Facilities Management

Specialist Certificates

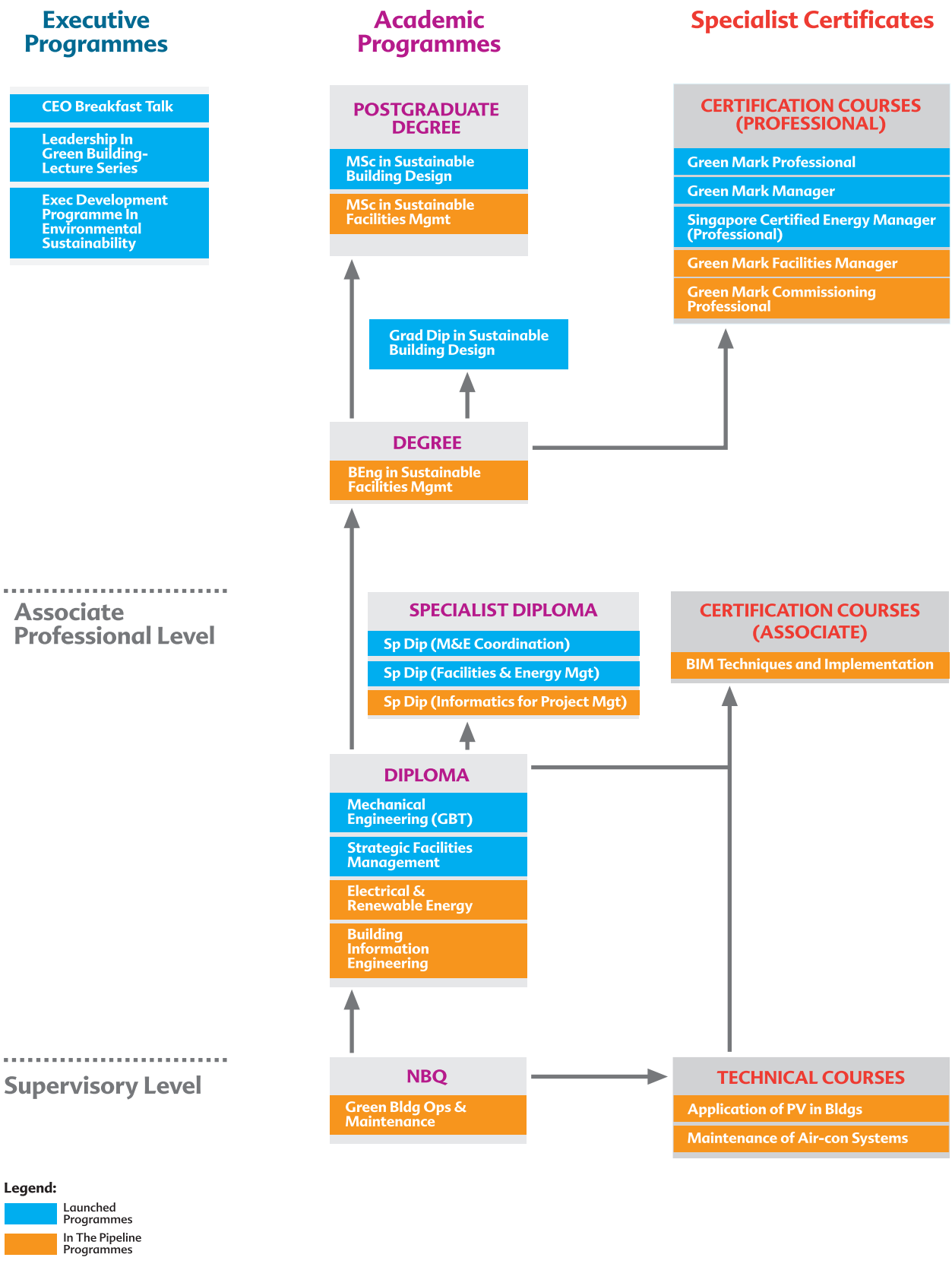
BCA also offers concise training programmes designed to equip professionals in niche areas of specialisation for continued professional development and industry recognition.

They include:

- Certification Course for Green Mark Managers
- Certification Course for Green Mark Facility Managers (upcoming)
- Singapore Certified Energy Manager Programme
- Certified Green Mark Professional Programme

  Modules:
  - Building Energy Modeling and Thermal Simulation
  - Efficient Building Envelope Design, ETTV and RETV
  - Efficient Eco-Lighting Design for Buildings
  - Energy Efficiency and Efficient Drives
  - Energy Efficient Air-Conditioning for Commercial Buildings
  - Energy Management and Audit
  - Green Architecture and the Integrated Design Process
  - Maximising Green Design through Building Automation
  - IAQ Solutions for Sustainable Buildings
  - Passive Building Designs for Natural Ventilation
  - Solar Modeling

Training Progression Chart (Green Programmes)



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