
## BUSINESS TARGETS

*Business or sales targets set business goals within a specific timeframe, considering items produced and sold, number of distributors or other units. Broader performance targets can also set goals for company efficiency and production aspects, including environmental performance or carbon outputs.* *(DGNB Reference PRO 1.7)*

Industrial Park Business Strategy

Growth Management

Industry Investment

**COST** ₹ ₹ ○ ○ ○

**IMPACT** ★ ★ ★ ★ ★


## COST - CUTTING

*Cost cutting refers to lowering production costs, whether through conserving resources, consolidating operating spaces or cutting facilities and salary costs. Some cost cutting can ensure that a business maintains profitability, particularly in difficult economic times. However, not all cost-cutting mechanisms are desirable or beneficial to employee experience.*

Economic Analysis

Business Targets

Phasing

**COST** ₹ ○ ○ ○ ○

**IMPACT** ★ ★ ★ ★ ○


## GROWTH MANAGEMENT

*Growth management includes policies related to growth, whether considering an increase of revenue through sales and service income, or an increase of profitability through minimizing costs. Growth management policies articulate the priorities of the company, as well as plans to scale up or grow operations when opportunities arise.* *(DGNB Reference ECO 1.2)*

Industrial Park Business Strategy

International Competitiveness

Industry Investment

**COST** ₹ ○ ○ ○ ○

**IMPACT** ★ ★ ★ ★ ★


## INDUSTRY INVESTMENT

*External investment may include foreign direct investment, or investment from other local, regional or national entities. External investment can provide companies with new opportunities for growth or expansion, although it also comes with responsibilities to investors, whether in the form of share ownership, voting privileges or adherence to international corporate requirements.*

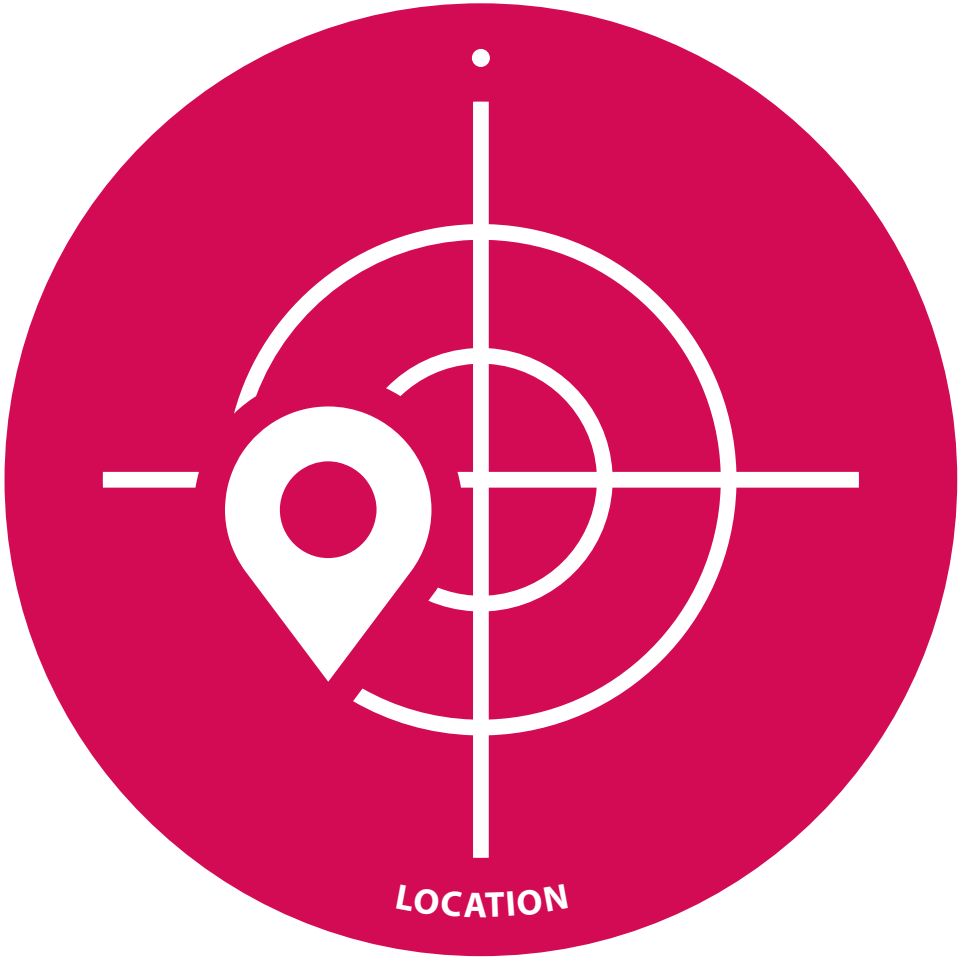
Business Incubator

Special Economic Zone

Investment Safety

**COST**

**IMPACT**




## LOCATION

*An industrial district's location is a key aspect of its overall business and operational strategy. A location close to suppliers and customers can reduce transport costs and carbon footprint, while being near a metropolitan area or knowledge centre can provide opportunities for synergy with collaborators. Employee transport access is also a key aspect to consider, as employees should be able to reach the district conveniently and efficiently.* (DGNB Reference ECO 1.2)

Proximity to Partners

Urban Framework

Highway Connection

**COST** ₹ ₹ ₹

**IMPACT** ★ ★ ★ ★ ★


## MARKET RESEARCH

*Market Research is the process of studying customer demographics, preferences and needs, as well as the broader activity of the market as a whole. The process can lead to product refinement or the development of new products, marketing or sales approaches. The process is qualitative and quantitative and can include demographic analysis, surveys, focus groups and product testing, carried out by the company or a third party.*

Industrial Park Business Strategy

Seed Funding

Unique Products

**COST** ₹ ₹ ○ ○ ○

**IMPACT** ★ ★ ★ ★ ○


# PRODUCTIVITY

*Productivity is an average measure of the efficiency of production. It can be expressed as the ratio of output to inputs used in the production process, i.e. output per unit of input. At the company level, typical partial productivity measures are such things as worker hours, materials or energy per unit of production. Efficient industrial districts should strive for healthy productivity, as a measure of sustainability and business success.*

ISO 9001
Quality Management

Efficient Use of Utilities

Lean Manufacturing

**COST** ₹ ○ ○ ○ ○

**IMPACT** ★ ★ ★ ★ ○


## PROXIMITY TO PARTNERS

*A location in close proximity to partners – such as service providers, suppliers, distributors and customers – can lead to additional efficiency in the supply and distribution chains and allow for a higher product quality. However, beyond quality, cost savings and time efficiency, a smaller travel footprint will reduce a company's carbon outputs and contribute to the development of a more sustainable product.*

Business Clustering

Industrial Symbioses

Talent Attraction

**COST** ₹ ₹ ○ ○ ○

**IMPACT** ★ ★ ★ ★ ○


# QUALITY INDOOR WORKING ENVIRONMENTS

*An optimal workplace should offer employees a safe, attractive place to work, including sufficient light, limited noise and comfortable temperatures. Ideally, this can be achieved in an energy-efficient work environment, with spaces monitored for utilities efficiency, including during peak and off-peak times of day.*

*(DGNB Reference SOC 1.8)*

Good Building Design

Ventilation

Well-being

**COST** ₹ ₹ ₹

**IMPACT** ★ ★ ★ ★


## RENTAL & OWNERSHIP STRUCTURE

*Some industrial districts may choose to operate on a rental and ownership structure, in which facilities are both rented and owned. This provides some flexibility in terms of facilities use, allowing companies to expand or try out new facilities with a decreased financial risk.*

Diversification

Limited Vacancy Rates

Industrial Zone Management

**COST** ₹ ₹

**IMPACT** ★ ★ ★


## SPATIAL EFFICIENCY

*An industrial district operates with a minimal amount of space, which must be utilized for a range of requirements, such as operations, production and management. Spatial efficiency refers to both the lay-out of the interior spaces and the arrangement of the overall facilities in relation to their partner facilities and surroundings. Efficient use of space can save time, improve employee comfort and reduce energy usage.* *(DGNB Reference ECO 2.3)*

System Thinking

Efficient Use of Utilities

Campus Atmosphere

**COST** ₹ ○ ○ ○ ○

**IMPACT** ★ ★ ★ ★ ○

# SEZ

SPECIAL ECONOMIC ZONE

SEZ

## SPECIAL ECONOMIC ZONE

*India's Ministry of Commerce and Industry first introduced a Special Economic Zones (SEZ) policy in 2000. Seeking to streamline economic development regulations and attract international investment, SEZs are geographic areas with clustered business development and modified business and trade regulations. Location in an SEZ can enable companies to produce goods and services at a globally competitive rate, with fewer tax and trade restrictions.*

*(DGNB Reference ECO 1.2)*

Industrial Zone Management

Industry Investment

Freight & Cargo Management

**COST** ₹ ₹ ₹

**IMPACT** ★ ★ ★ ★


## COMPANY RECOGNITION

*Company recognition – whether on account of an excellent product, service or employee culture – is a show of success and a key aspect of corporate identity and branding. Companies can seek out recognition through programs such as awards and sustainability certifications like DGNB, LEED or BREEAM, or may achieve it through reputation and work outputs. This recognition can contribute to employee morale and talent attraction.*

District Certification

Employee Morale & Motivation

Talent Attraction

**COST** ₹ ₹

**IMPACT** ★ ★ ★


## CUSTOMER PROFILE

*Developing a customer profile of a product's end customer should assist companies in product development, marketing and distribution strategy. Rather than focusing solely on the demands of distributors or those in the supply chain, companies should actively consider and gauge customer demographics, preferences and interests.*

Customer for Life

Market Research

Unique Products

**COST** ₹ ○ ○ ○ ○

**IMPACT** ★ ★ ★ ○ ○


## D.I.Y.

*D.I.Y. or "do it yourself" is an approach that celebrates self-led projects and initiatives. Companies can capitalise on the "spirit of DIY" by making use of employee ideas and the tools available in house, ensuring employees feel comfortable sharing their ideas, skills and ways of doing things. However, it is not appropriate to jeopardise safety of product quality through inappropriate use of DIY.*

Team Atmosphere

Cost-cutting

Open Source Information

**COST** ₹ ○ ○ ○ ○

**IMPACT** ★ ★ ○ ○ ○


# DIVERSIFICATION

*Diversification is a strategy for risk-reduction, in which a company offers a range of products, services or market areas. Growth through diversification develops new revenue streams and reduces the risks associated with relying on a single product. Serving a wide variety of consumers or locations can contribute to resiliency in times of financial crisis or during other less extreme market movements.* *(DGNB Reference ECO 2.4)*

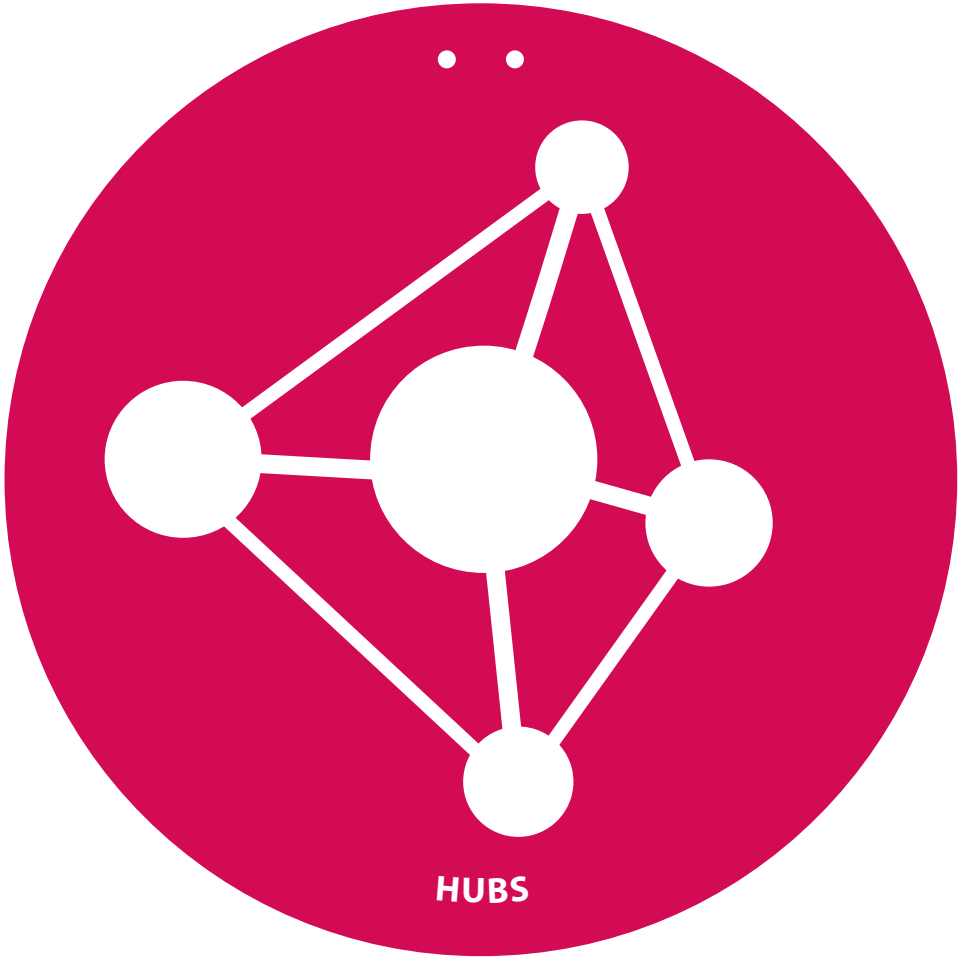
Industrial Park Business Strategy

Growth Management

Branding & Identity

**COST** ₹ ₹ ○ ○ ○

**IMPACT** ★ ★ ★ ★ ★




## HUBS

*Hubs are regional destinations and economic centres, which typically feature multiple uses and opportunities in a small geographic area. These central, active areas often include retail, entertainment and office development, as well as residential units and ample transport infrastructure. Industrial Districts may be located near hubs, for employee convenience, or may develop adjacent to hubs if operations are small-scale and not disruptive in an urban context.*

Connectivity

Air Travel Connectivity

Internet of Things and Services

**COST** ₹ ₹ ₹

**IMPACT** ★ ★ ★ ★ ★


## INCENTIVES FOR GREEN BUILDINGS

*Designing green, energy-efficient buildings is a long-term investment and beneficial to society as a whole. Accordingly, the Indian Government, as well as other international organisations, have set up numerous incentives to encourage the development of green buildings, many of which can provide good opportunities for industrial districts. These include financial incentives, expedited permitting, tax incentives, training programmes and opportunities to build at a higher density or FAR or to receive benefits in the plot purchase/rent.*

Green Building

District Certification

Cost Cutting

**COST**

**IMPACT**


# INTERNATIONAL COMPETITIVENESS

*In today's global market, truly successful businesses are internationally competitive. India's low operating costs make the country extremely attractive for delivering low-cost products and services. Industrial district strategies can combine these attributes with a dedication to product quality to advance internationally.*

Unique Products

Market Research

Creative Value Add

**COST** ₹ ₹

**IMPACT** ★ ★ ★


## INVESTMENT SAFETY

*Companies should have transparent relationships and regular communications with their investors, providing data on business strategy, projections, gains and losses. Companies should not be reckless with external funds and should be clear about how funds are spent, particularly if in the midst of capital projects or other strategic improvements.* *(DGNB Reference ECO 2.4)*

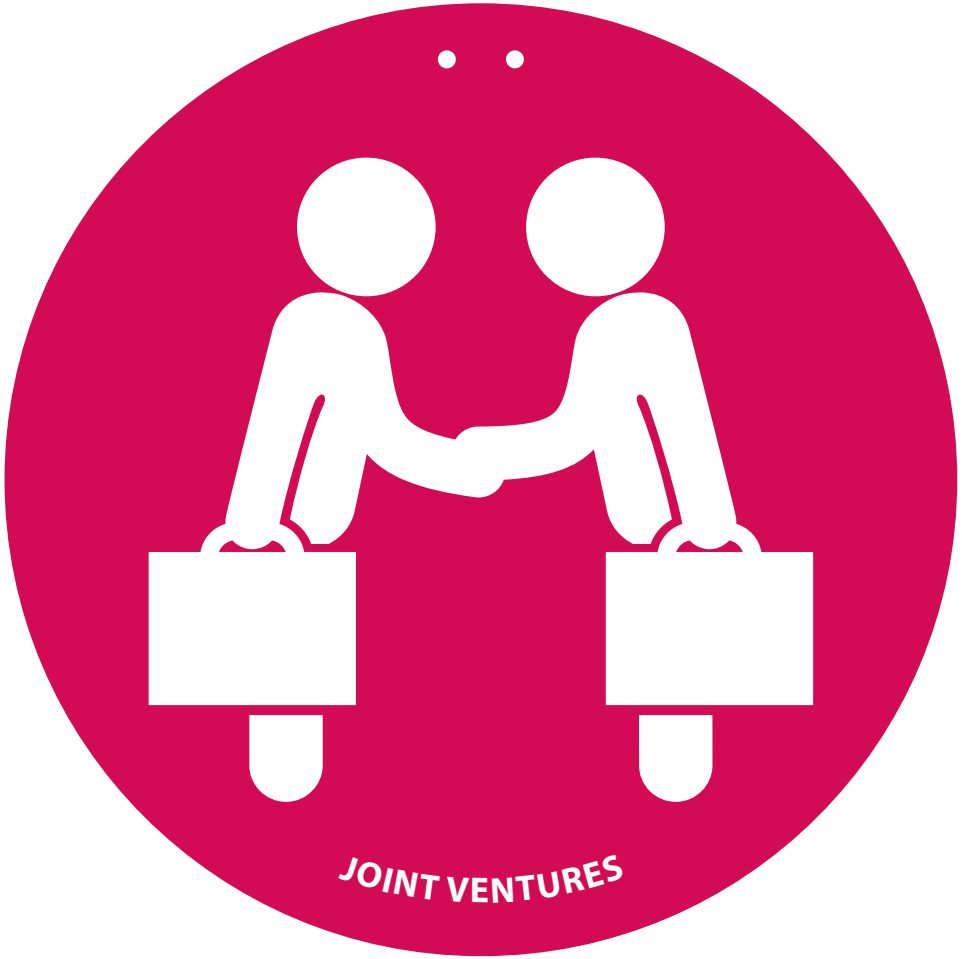
Industrial Park Business Strategy

Growth Management

Economic Analysis

**COST**

**IMPACT**




# JOINT VENTURES

*A joint venture is a business agreement or commercial venture undertaken by two parties in partnership. While the partners pool their resources and share profits and risks for the relevant task, the two otherwise maintain distinct identities. Joint ventures can be an efficient way to pool capital and reduce risk, although they also require identification of an optimal partner and agreement on legal parameters.* *(DGNB Reference ECO 1.2)*

Joint Purchasing

Growth Management

PPP

Public Private Partnerships

**COST**

**IMPACT**


## RESEARCH & DEVELOPMENT

*Research and development (R+D) are internal activities carried out to help companies discover new products or procedures, or improve existing ones. An investment in R+D can lead towards innovation and the creation of new opportunities for the company. A commitment to R+D can also contribute to talent attraction and retention, by showing a company's forward-thinking culture.*

Unique Products

Creative Value Add

Talent Attraction

**COST** ₹ ₹ ₹

**IMPACT** ★ ★ ★ ★ ★


## TALENT ATTRACTION

*The most successful companies are able to attract the most talented potential employees, due to reputation for high quality work and excellent work environment. Marketing, human resources and company culture all contribute to talent attraction, with talented employees seeking stimulating work, a high-quality brand and good pay. An Industrial Association talent pool might help to rise at different companies within the district.*

Professional Mobility

Company Recognition

Education Provision

**COST**

**IMPACT**


# TALENT RETENTION

*After attracting a talented workforce, companies must provide a stimulating, healthy and safe work environment to retain this talent. Providing employees with education and training, advancement opportunities and good compensation can all contribute to talent retention. "Soft factors," such as fostering a supportive team atmosphere, can also create a pleasant work environment that will lead to employee loyalty.* *(DGNB Reference ECO 2.4)*

Team Atmosphere

Employee Morale & Motivation

Education Provision

**COST** ₹ ₹ ○ ○ ○

**IMPACT** ★ ★ ★ ★ ○


# ADAPTATION STRATEGY

*Adaptation means anticipating the local effects of global climate change and taking action to prevent or minimise the damage they can cause. It has been shown that well planned, early adaptation action saves money and lives later.* *(DGNB Reference ECO 2.1)*

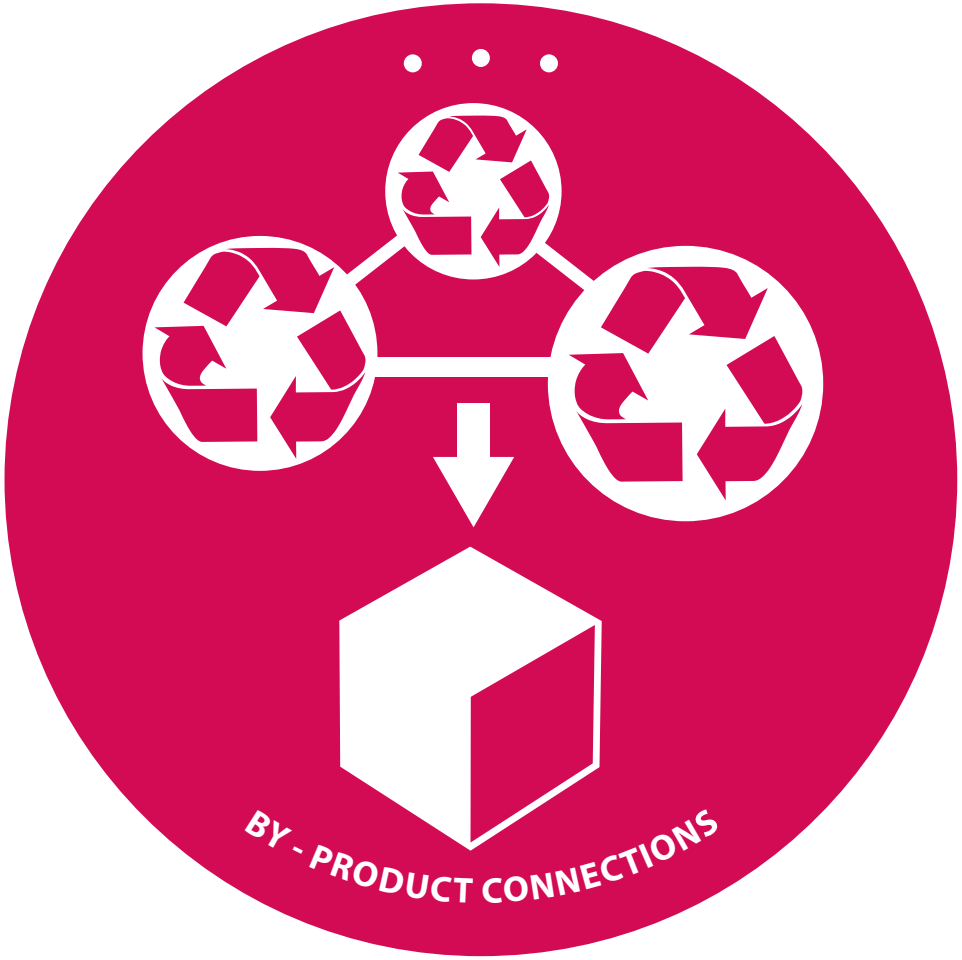
Global Warming Awareness

Industrial Disaster Risk Management

Integration into Regional Structures

**COST** ₹ ○ ○ ○ ○

**IMPACT** ★ ★ ★ ★ ○




## BY - PRODUCT CONNECTIONS

*By-products are secondary products, produced during industrial or destructive processes. Companies should consider whether there is a viable commercial or operational use for these by-products, whether on the market or as materials of value to collaborators or supply chain partners.*

Lifecycle Awareness

Smart Material Selection

Corporate Data Systems

**COST** ₹ ○ ○ ○ ○

**IMPACT** ★ ★ ★ ★ ○


## COST STABILITY

*Cost stability is the situation by which the prices of goods and services in a market do not change, or change extremely slowly. Cost stability is most likely in environments with limited inflation and a consistent business environment. Stable costs are attractive to consumers, and companies can seek to keep product costs constant by monitoring and maintaining predictable operational and staffing costs.* *(DGNB Reference ECO 2.4)*

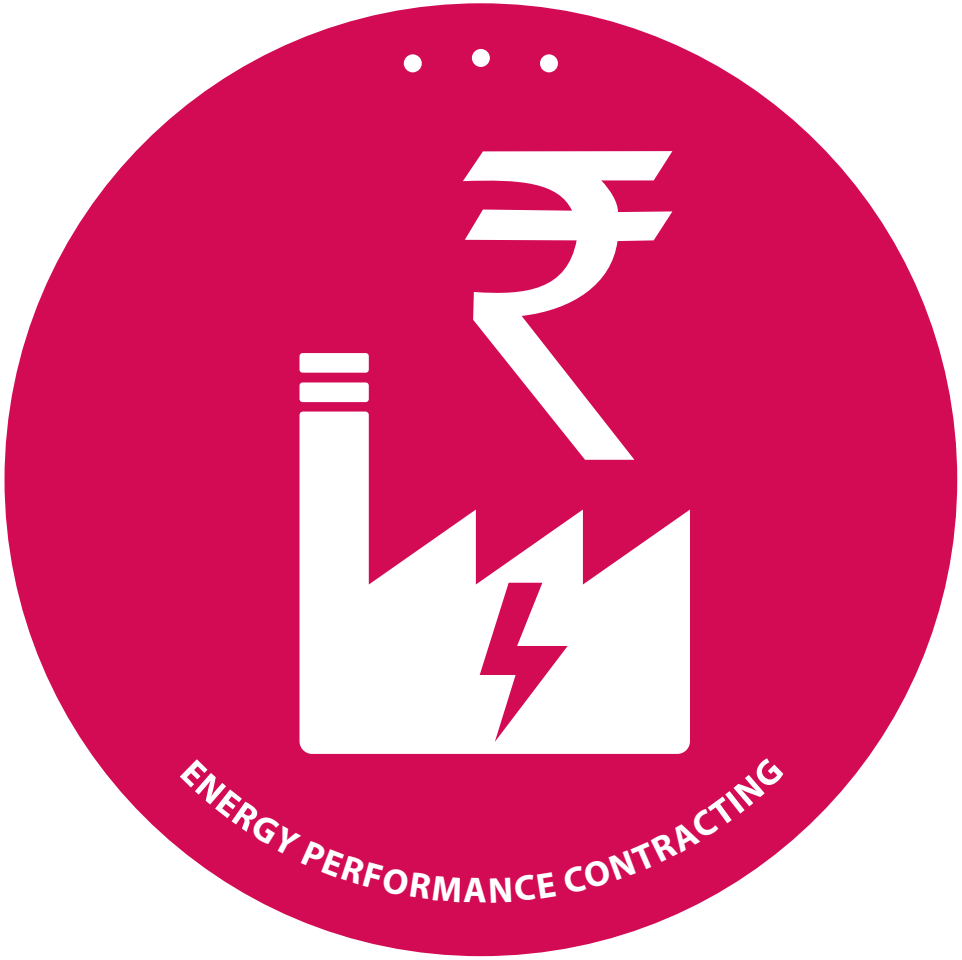
Business Targets

Customer for Life

Cost Cutting

**COST**

**IMPACT**




# ENERGY PERFORMANCE CONTRACTING

*Energy Performance Contracting is a creative funding strategy, which funds energy technologies through the projected energy savings after implementation. Energy Performance Contracting can enable industrial districts to invest in renewable infrastructure that would otherwise be unaffordable due to upfront capital costs. The concept is a "win " for both investors and facilities seeking to enhance renewable energy capabilities.*

Efficient Use of Utilities

Solar PV

PPP

Public Private Partnerships

**COST**

**IMPACT**


## JUST-IN-TIME DELIVERY

*Just-in-Time (JIT) delivery is a strategy to maximise efficiency and minimise inventory costs through the timing of deliveries. These deliveries should arrive only when they are needed in the production process, eliminating the need to store and retrieve materials. This strategy requires good lines of communication with all participating in the industrial supply chain, as well as reliable transport and delivery.*

Proximity to Partners

Air Travel Connectivity

Freight & Cargo Management

**COST** ₹ ₹ ₹ ○ ○

**IMPACT** ★ ★ ★ ○ ○


# LIFECYCLE ANALYSIS & COSTING

*Lifecycle Analysis (LCA), also known as Cradle-to-Grave analysis, assesses the environmental impacts of all stages of a product, service or process. The LCA process compiles an inventory of energy and material inputs related to the product and evaluates their environmental effects, enabling producers and consumers to make more informed decisions about the product.* *(DGNB Reference ECO 1.1)*

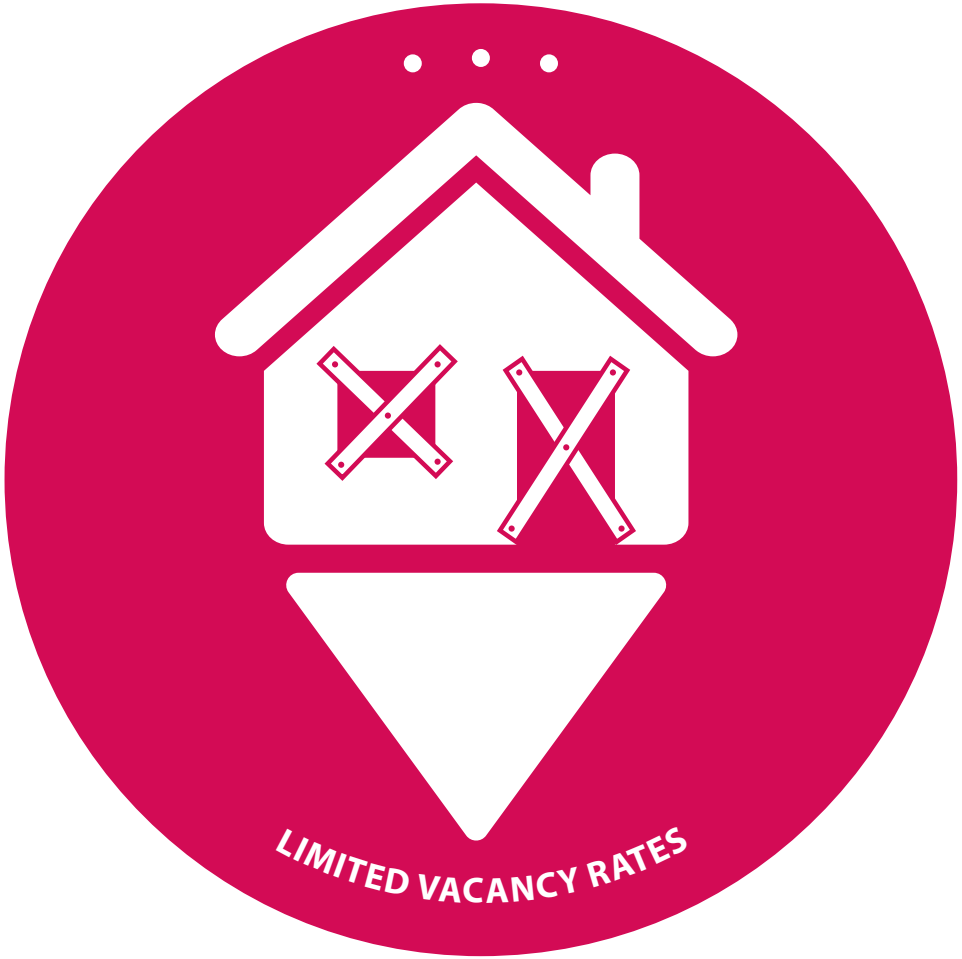
Environmental Stewardship

Sustainable Procurement

Recycling

**COST** ₹ ₹ ₹

**IMPACT** ★ ★ ★ ★ ★




## LIMITED VACANCY RATES

*If an Industrial District owns and rents out surplus space to other parties, the company should strive to achieve limited vacancy rates at all times. This requires proactive communication with tenants and the location of new tenants in times of turn-over. Green industrial spaces with low energy operating costs may be particularly attractive to tenants.*

Rental & Ownership Structure

Spatial Efficiency

Industrial Zone Management

**COST** ₹ ○ ○ ○ ○

**IMPACT** ★ ★ ★ ○ ○


## MASS CUSTOMISATION

*Mass customisation is the process of producing a high volume of customised goods, combining the speed and convenience of mass production with the flexibility of customisation. There is increased interest in these sorts of "made to order" goods and developing processes to accommodate them also leads to enhanced flexibility and improvement of production processes.*

Cost Cutting

Rapid Prototyping

Custom Manufacturing

**COST** ₹ ₹ ₹ ₹

**IMPACT** ★ ★ ★ ★


## PROFESSIONAL MOBILITY

*Professional mobility offers all employees the chance to advance within an organization and further develop their knowledge and skills – ideally within the Industrial District. Growth within an organisation may comprise additional responsibility, financial advancement or exposure to new disciplines, with rewards provided for good performance. Opportunities for professional mobility can motivate employees and contribute to morale and talent retention.*

Education Provision

Talent Retention

International Competitiveness

**COST** ₹ ○ ○ ○ ○

**IMPACT** ★ ★ ★ ★ ○


# REPUTATION MANAGEMENT

*Industrial districts should protect their reputations through pro-active efforts such as public relations and communications. The advancement of internet and social media has led to a wider availability of information and speculation about businesses. While Reputation Management can include some ethical grey areas, such as censoring negative complaints, there are also ethical forms which should be used to ensure correct information is widely available.*

Company Recognition

Relationship Building

Branding & Identity

**COST**

**IMPACT**


## SEED FUNDING

*Seed Funding is external investment, typically in the form of a partial purchase of a business. Often provided in the early days of a company's development, seed funding can enable growth and movement from the conceptual phase to mature operation, perhaps by covering early research or operating expenses before revenue is generated. Both international and local venture capitalists can provide Indian companies with seed funding in exchange for stakes in the businesses.*

Growth Management

Industry Investment

Business Incubator

**COST** ₹ ○ ○ ○ ○

**IMPACT** ★ ★ ★ ★ ○


## SYSTEM THINKING

*Systems thinking is the discipline of understanding how networks connect and influence each other. The thinking can relate to ecosystems, industrial processes and many other areas, and promotes organizational communication and problem solving.*

Lifecycle Analysis & Costing

Industrial Symbioses

Business Clustering

**COST**

**IMPACT**


## UNIQUE PRODUCTS

*Unique products or services will keep businesses relevant and profitable, given that other good business planning practices are in place. Function, design, cost and market positioning all contribute to the uniqueness of a product and consumers' product take-up. Research & Development can lead to technologies enabling product advancement, while Market Research can determine levels of consumer interest.*

Customer Profile

International Competitiveness

Industry Investment

**COST** ₹ ₹ ₹ ₹

**IMPACT** ★ ★ ★ ★ ★


WILDCARD
COST
IMPACT
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# GLOBAL WARMING AWARENESS

*Global Warming, or climate change, is described by many as the biggest environmental and social crisis underway in the world today. Carbon emissions are the most prominent cause of global warming, and industrial districts should seek to minimise these emissions through use of renewable energy sources, re-purposed materials and energy-efficient products. Awareness of global warming among employees can also contribute to long-term behavioural change.* *(DGNB Reference ENV 1.6)*

Environmental Stewardship

Minimisation of Greenhouse Gases

Knowledge Guidebooks

**COST** ₹ ○ ○ ○ ○

**IMPACT** ★ ★ ★ ★ ○


# IRRIGATION SYSTEMS

*Irrigation is the artificial application of water to the land or soil. It is used to assist in the growing of agricultural crops and maintenance of landscapes. Irrigation is often studied together with drainage, which is the natural or artificial removal of surface and sub-surface water from a given area. Irrigation systems include automated sprinkler irrigation, drip systems, irrigation through gravity or sub-irrigation.*
*(DGNB Reference ENV 2.2)*

Constructed Wetlands

Grey Water Recycling

Rain Water Usage

**COST** ₹ ₹ ○ ○ ○

**IMPACT** ★ ★ ★ ★ ○


## HAZARDOUS WASTE TREATMENT

*Soil contamination, which leads to health risks and environmental damage, can be caused by industrial and agricultural activity or improper waste disposal. Potentially hazardous soil should be either excavated and treated, treated in place or contained. Treatment can include using natural organisms to break down contaminants, destroying the hazardous materials through incineration or flushing contaminants out of the soil with chemical solvent, water or air.* *(DGNB Reference ENV 1.2)*

Toxic Waste Reduction

Landfill/Rubbish Management

Producer Responsibility

**COST** ₹ ₹ ₹

**IMPACT** ★ ★ ★ ★


# LIFE CYCLE AWARENESS

*A life cycle assessment determines the full environmental costs of a product, considering supply chain, production, use and disposal. Industrial districts should be aware of the broader impacts of their products beyond production, seeking out a more sustainable supply chain and ensuring that products are durable and low-impact after use.* *(DGNB Reference ENV 1.1)*

Producer Responsibility

Sustainable Procurement

By-Product Connections

**COST** ₹ ○ ○ ○ ○

**IMPACT** ★ ★ ★ ○ ○


# MINIMISED NON-RECYCLABLE GOODS

*An industrial district's sustainability strategy must address the volume of non-recyclable goods used in the production process and otherwise in operations. Ideally, waste should be minimised through the use of post and pre-consumer recyclables in production and operations, such as plastics, glass and paper. Non-recyclables should then be managed conscientiously, through a waste collection and disposal strategy.* *(DGNB Reference ENV 2.1)*

Landfill/Rubbish Management,

Life Cycle Awareness

Smart Material Selection

**COST**

**IMPACT**


## ORGANIC COMPOSTING

*Organic composting involves collecting green and food waste, to decompose and recycle as a soil amendment or fertiliser. Rich in nutrients, compost can be very beneficial for gardens, landscape or organic farming, and can also reduce overall waste.* *(DGNB Reference ENV 2.4)*

Organic Sources

Preservation of Agriculture

Local Food Production

**COST**

**IMPACT**


## MINIMISATION OF GREENHOUSE GASES

*Greenhouse gases include carbon dioxide, methane, nitrous oxide, as well as other gaseous compounds that absorb infrared radiation and hold heat in the atmosphere. Human activities such as electricity production, transportation and industry all contribute to the emission of greenhouse gases. Use of renewable and energy efficient mechanisms can reduce emissions.* (DGNB Reference ENV 1.1)

Environmental Stewardship

Clean Energy Strategy

Polluter Pays Principle

**COST** ₹ ₹ ₹

**IMPACT** ★ ★ ★ ★ ★


# ENVIROMENTAL STEWARDSHIP

*Environmental stewardship is acknowledging responsibility towards the environment, and fostering sustainable and ethical business practices to minimise environmental impact. Environmental stewardship should be an important aspect of any industrial district management strategy, and also has a role to play in the company culture imparted to employees. Recycling programs, use of renewable energy and water conservation are all aspects of a visible environmental stewardship strategy.* (DGNB Reference ENV 1.1)

Global Warming Awareness

Leadership

Knowledge/ Guidebook

**COST** ₹ ○ ○ ○ ○

**IMPACT** ★ ★ ★ ★ ○


## PUBLIC WASTEWATER SEWER

*Public or Industrial sewers manage foul and surface water, keeping the two entities separate whenever possible. Surface water can also be managed by stormwater systems and green infrastructure, lightening the burden on public systems. Wastewater, however, must be treated before disposal, although much of India's sewage currently flows untreated. Wastewater sewers must be regularly maintained, and industrial districts should ensure functionality of systems in their district, as well as considering public access.*
*(DGNB Reference ENV 2.2)*

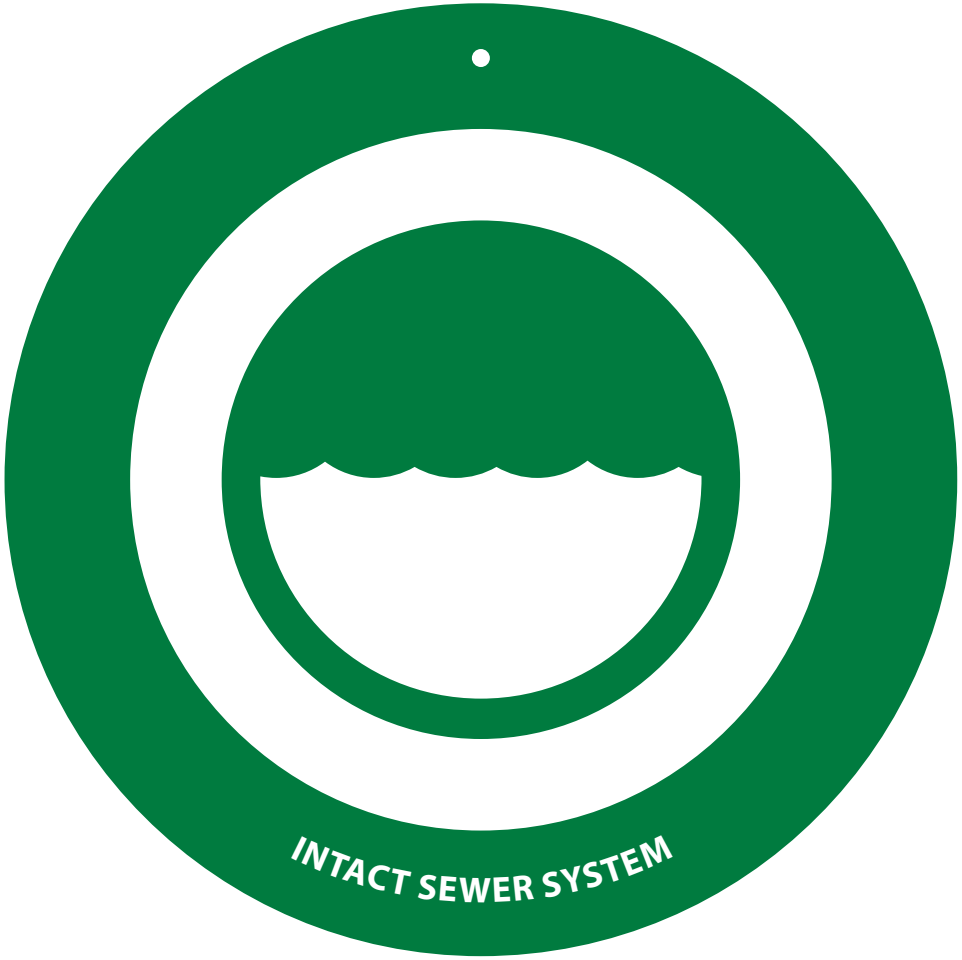
Sewage Monitoring

Irrigation Systems

Intact Sewer System

**COST** ₹ ₹

**IMPACT** ★ ★ ★ ★




## INTACT SEWER SYSTEM

*Much of India's sewage currently flows untreated into lakes, rivers and ponds, causing water pollution and high nitrate levels in groundwater aquifers. The population relies on this groundwater for drinking and other needs, meaning that the current situation comprises both an environmental and health crisis. Sustainable industrial districts must utilize intact sewer systems, avoiding hazardous outcomes and continuously monitors their sewer systems.* *(DGNB Reference ENV 1.7)*

Public Wastewater Sewer

Sewage Monitoring

Proper Sanitation

**COST**

**IMPACT**


## WATER PRESERVATION

*Water conservation is critical to the design of a sustainable industrial district. Strategies include water reuse, water recycling systems, conservation measures and system optimization through the incorporation of water-efficient technologies. By preserving water, an industrial district will lower external water consumption, improving resource efficiency and providing savings for operations.*

*(DGNB Reference ENV 2.2)*

Grey Water recycling

Green Building

Resource Efficient Landscape

**COST** ₹ ₹

**IMPACT** ★ ★ ★


## RAINWATER USAGE

*Rainwater usage, or rainwater harvesting, is an important part of any stormwater management strategy. The practice comprises capturing, filtering and utilising any rainwater on-site, whether for irrigation, water features, or domestic use after proper treatment. Rainwater harvesting provides an independent water supply, reducing water usage and making the most of naturally available resources.* *(DGNB Reference ENV 2.2)*

Management of Stormwater

Water Preservation

Efficient Use of Utilities

**COST** ₹ ○ ○ ○ ○

**IMPACT** ★ ★ ★ ○ ○


## TOXIC WASTE REDUCTION

*Toxic waste, whether including lead, chromium or other chemicals, is material that can cause disease, disability or death to humans, animals or plants. Whether produced by industry, farming, laboratories or households, hazardous waste contaminates its surroundings and poses long-term risks to the environment and surrounding communities. Industrial districts must seek to minimise their toxic waste outputs and follow regulations addressing the handling and disposal of toxic waste.* *(DGNB Reference ENV 1.7)*

Smart Material Selection

Soil Monitoring

Producer Responsibility

**COST** ₹ ₹ ₹ ○ ○

**IMPACT** ★ ★ ★ ★ ★


# FLOOD PROTECTION

*Flood protection is essential for buildings on any site susceptible to flooding, whether on account of geography, rising tides or storm vulnerability. Stormwater management techniques can contribute to flood preparation. Other methods include both environmental interventions, such as dams, and building and management interventions, such as flood barriers and plans for chemical spill containment.* *(DGNB Reference ENV 1.6)*

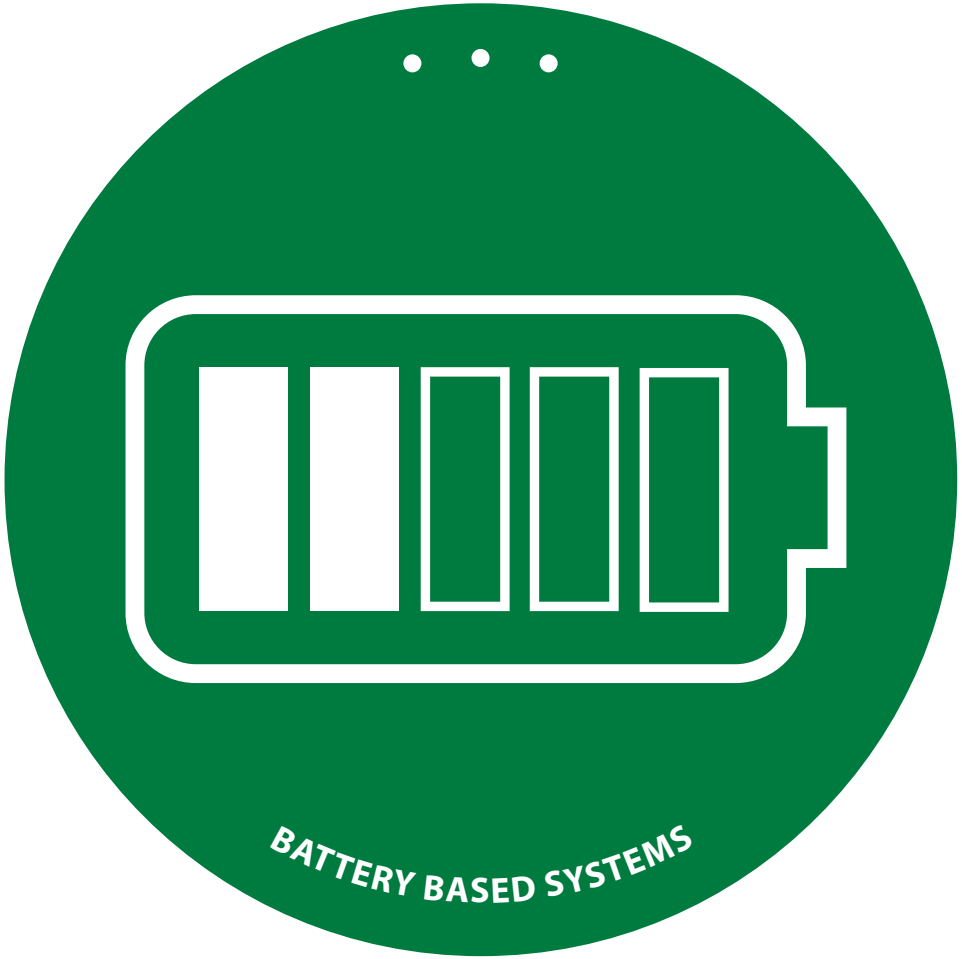
Stormwater management

Industrial Disaster Risk Management

Adaptation Strategy

**COST** ₹ ₹ ₹

**IMPACT** ★ ★ ★ ★




## BATTERY BASED SYSTEMS

*Battery based systems, including electric vehicles, offer an alternative to fossil fuel-based systems and thus can be an attractive part of a sustainability strategy. Batteries convert chemical energy into electric energy, and can also store electricity from wind and solar generation. However, given the metals and toxins within batteries, disposal must be considered within an overall recycling strategy.*

Efficient Vehicles

Recycling

Wind Power

**COST** ₹ ₹

**IMPACT** ★ ★


# AIR QUALITY MONITORING

*Air Quality in India is currently among the worst in the world – the 2014 Environmental Performance Index ranked India's air pollution 174th in comparison to 178 countries. While a new Air Quality Index launched in 2015 will measure urban air quality, industrial districts must also monitor impact at a more localised scale. Industrial districts should measure pollutants in both indoor and outdoor air, ensuring that operations are compliant with air quality regulations.*

*(DGNB Reference ENV 1.3)*

Environmental Stewardship

Minimisation of Greenhouse Gases

Producer Responsibility

**COST** ₹ ₹

**IMPACT** ★ ★ ★ ★


## NON-POTABLE WATER STRATEGY

*Non-Potable water is water which cannot be used for drinking, but which may be used for other purposes, such as irrigation or industry. For example, grey water can be captured through stormwater management systems, treated and re-used for toilet flushing or plant watering. Every industrial district should consider how non-potable water can be re-used, to diversify water supply and contribute to broader goals for water conservation.* *(DGNB Reference ENV 2.2)*

Grey Water Recycling

Water Preservation

Sewage Monitoring

**COST** ₹ ₹ ○ ○ ○

**IMPACT** ★ ★ ★ ★ ○


## EXTERNAL WATER FEATURES COOLING

*Water features can cool the air due to the phenomenon of evaporative cooling, a temperature reduction due to the evaporation of a liquid. The water evaporation from a pool or fountain cools the surrounding air, with opportunities for synergy with breezes and ventilation planning. Water features also offer aesthetic advantages in public space and can improve localised temperatures for public space users.* *(DGNB Reference ENV 1.5)*

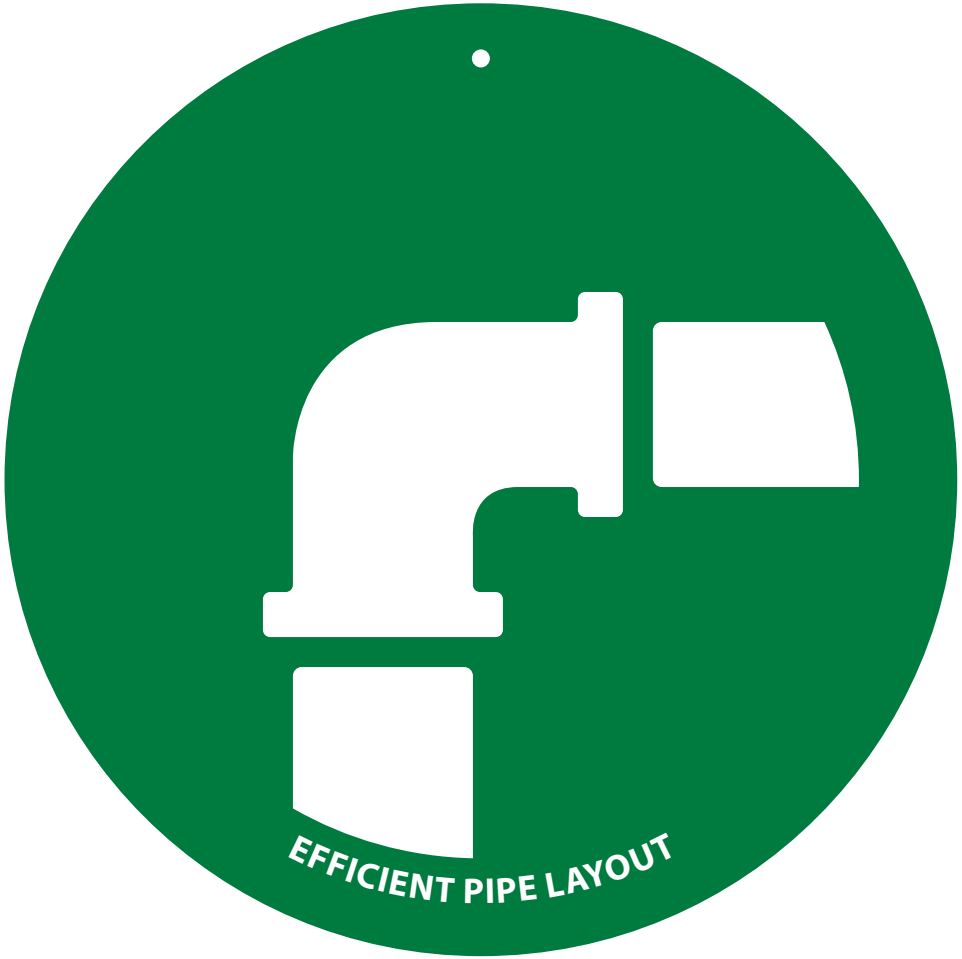
Grey Water Recycling

Management of Stormwater,

Open Public Space

**COST** ₹ ₹ ○ ○ ○

**IMPACT** ★ ★ ○ ○ ○




# EFFICIENT PIPE LAYOUT

*A pipe system should be designed to accommodate a building's required pressure, flow rate and temperature, carrying media between tanks, filtration systems and users. The system must also be compatible with the local ground conditions and climate. Inefficient pipe layouts can waste hot water and can also be wasteful in terms of the volume of materials used for the pipes themselves.* *(DGNB Reference ENV 1.1)*

Good Building Design

Efficient Use of Utilities

Cost Cutting

**COST** ₹ ○ ○ ○ ○

**IMPACT** ★ ★ ★ ○ ○


## WATER TREATMENT SYSTEM

*Water treatment is the process which prepares water for an end-use, whether drinking, tertiary use or mechanical use. Processes can be natural or chemical, and remove physical or chemical disinfectants. Water treatment is critical to any industrial district and should be considered in the concept of broader grey water and non-potable water strategies, with opportunities identified to capture and treat water on site.* *(DGNB Reference ENV 2.2)*

Grey Water Recycling

Proper Sanitation

Non-Potable Water Strategy

**COST** ₹ ₹ ₹ ○ ○

**IMPACT** ★ ★ ★ ★ ★


# BIODIVERSITY PRESERVATION

*Biodiversity is the variety of plant and animal life in any particular ecosystem or setting. When developing new facilities, local biodiversity should first be measured through an Environmental Impact Assessment and then accommodated, whether on-site or within an equally attractive and appropriate site in the area.* *(DGNB Reference ENV 1.4)*

Constructed Wetlands

Tree Selection and Preservation

Green Networks

**COST** ₹ ○ ○ ○ ○

**IMPACT** ★ ★ ★ ★ ○


## GREEN BUILDING

*Green building is the design of environmentally sustainable and resource-efficient structures. The design of green buildings should consider their entire life cycle, including building planning, siting, construction, operation and maintenance. Energy efficiency, use of water, materials and waste management are all issues relevant to green building design, as well as green industrial district design.*

District Certification

Energy Efficiency

Building Orientation

**COST** ₹ ₹ ₹

**IMPACT** ★ ★ ★ ★ ★


# ENERGY EFFICIENCY

*Energy efficiency comprises the management and reduction of energy consumption. A sustainable industrial district must strive to achieve energy efficiency, reducing overall greenhouse gas emissions and producing the necessary products or services with minimal wasted energy outputs.* *(DGNB Reference ENV 1.1)*

Efficient Vehicles

Clean Energy Strategy

Minimisation of Green House Gases

**COST** ₹ ₹ ○ ○ ○

**IMPACT** ★ ★ ★ ○ ○


## TREE SELECTION & PRESERVATION

*Trees offer numerous benefits to their surrounding environments, such as carbon sequestration, soil erosion prevention and stormwater management. Equally importantly, trees create pleasant environments for their surrounding communities, while providing natural cooling through tree canopy. Industrial district site design should accommodate existing trees, and select new ones appropriate to local habitats and water availability.*

*(DGNB Reference ENV 1.4)*

Open Public Space

Shade Provision

Biodiversity Preservation

**COST** ₹ ○ ○ ○ ○

**IMPACT** ★ ★ ★ ○ ○


NaCl
DESALINATION


NaCl
DESALINATION
Desalination comprises processes which remove salt and other minerals from seawater, before irrigation, industrial use or consumption. The process is rare in that it produces usable water without a dependence on rainfall, and may become more important in upcoming years due to water scarcity. Desalination methods include reverse osmosis and vacuum distillation.
(DGNB Reference ENV 2.2)
Water Treatment System
Non-Potable Water Strategy
Water Preservation
COST
IMPACT
© BuroHappold Engineering 2015


# GREEN ROOF SYSTEMS

*A Green Roof, or a more comprehensive Living Roof, is a roof of a building that is partially or entirely covered by vegetation. Green roofs absorb rainwater, create wildlife habitat, provide insulation and offer a pleasant aesthetic effect. The systems typically include a growing medium and a waterproofing layer and can also include a root barrier and draining or irrigation systems. In some instances they can also carry Photovoltaic elements that benefit from the lower surface temperatures and thus last longer.* *(DGNB Reference ENV 1.4)*

Solar (PV)

Stormwater Management

Urban Heat Island Mitigation

**COST** ₹ ₹ ○ ○ ○

**IMPACT** ★ ★ ★ ○ ○


## ORGANIC SOURCES

*The vast majority of new buildings produced by the construction industry are made of man-made materials such as steel, brick, aluminium and concrete. Wood, bamboo, natural paints, natural oils and other organic sources offer an alternative for lower embodied-energy buildings with improved indoor air quality. These materials should be responsibly sourced and can also be used in recycled form.*

Smart Material Selection

Biomass Provision

Informal Housing Upgrade

**COST** ₹ ₹

**IMPACT** ★ ★ ★


# GREYWATER RECYCLING

*Grey water is domestic wastewater, aside from sewage, and can be recycled for uses such as plant irrigation and toilet flushing. Recycling this water – through an on-site system, including biological or mechanical filtering processes – can reduce both water consumption and the volume of water entering the sewers for treatment.* *(DGNB Reference ENV 2.2)*

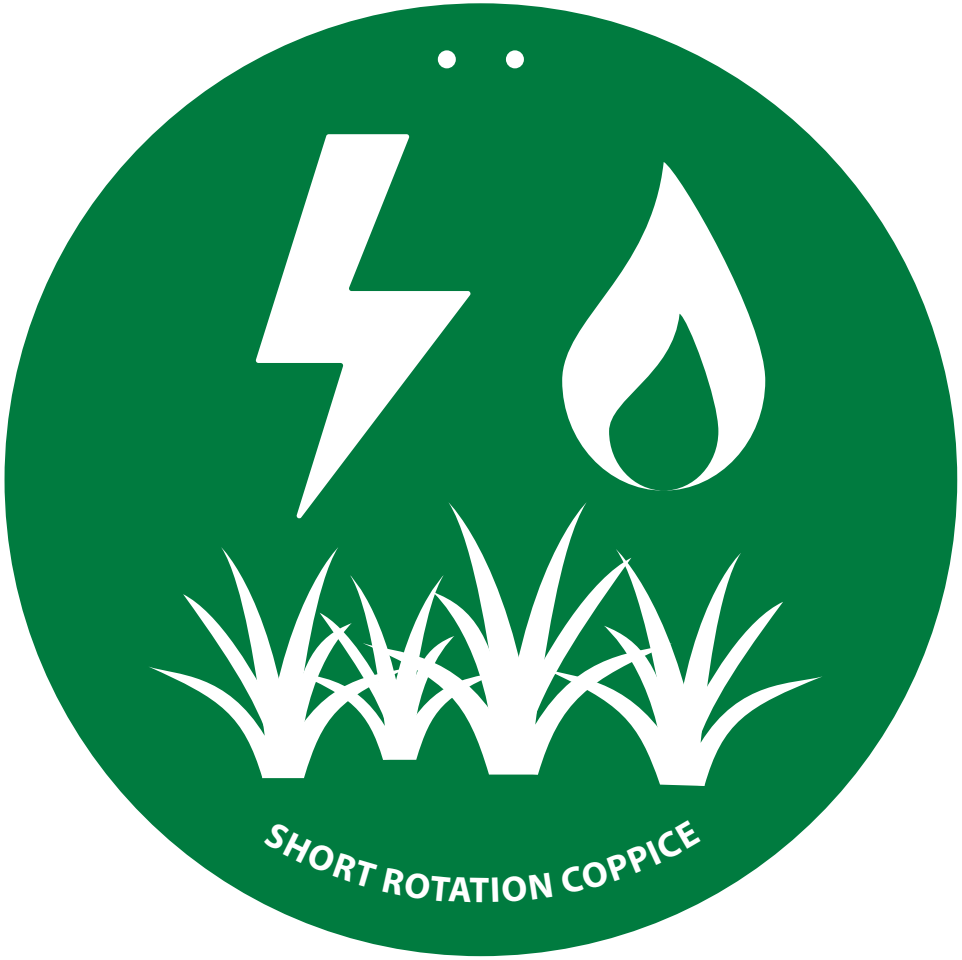
Green Networks

Green Roof Systems

Non-Potable Water Strategy

**COST** ₹ ₹

**IMPACT** ★ ★ ★




## SHORT ROTATION COPPICE

*Short Rotation Coppice (SRC) is a type of energy crop, a woody biomass that can be used for electric power generation, district heating or in combination with other fuels. The crop can be planted in diverse soil types from sand to heavy clay, with four years required before the first harvest. The energy crop is an excellent source of renewable energy, generating few greenhouse emissions and positively contributing to biodiversity.* *(DGNB Reference ENV 2.5)*

Clean Energy Strategy

Biomass Provision

Preservation Of Agriculture

**COST** ₹ ₹

**IMPACT** ★ ★ ★


## PRESERVATION OF AGRICULTURE

*One of the most prominent livelihoods in India, agriculture is an important aspect of the national economy and is also critical in terms of food security and natural resource management. When industrial districts are located in formerly agricultural areas, nearby agricultural land should be protected and preserved.*

*(DGNB Reference ENV 2.3)*

Local Food Production

Community Relationship

Irrigation Systems

**COST** ₹ ○ ○ ○ ○

**IMPACT** ★ ★ ★ ○ ○


# GROUND SOURCE COOLING

*Ground source heating and cooling uses the earth's crust as a natural source for heating, or as a heat sink for cooling. The system extracts heating or cooling from the ground and is typically "closed loop," including pump and pipe infrastructure. The system can also be "open loop" or hybrid, where local geography permits.*

*(DGNB Reference ENV 1.1)*

Minimisation of Green House Gases

Resource Integration

Efficient Pipe Layout

**COST** ₹ ₹ ₹ ₹

**IMPACT** ★ ★ ★ ★


# URBAN HEAT ISLAND MITIGATION

*Urban Heat Island (UHI) effect refers to the heat created in cities through a high density of energy use, transportation and human activity. Trees and other vegetation can mitigate UHI through carbon sequestration and natural cooling, providing shading, stormwater management and aesthetic benefits as well.*

*(DGNB Reference ENV 1.5)*

External Water Features Cooling

Resource Efficient Landscape

Adaptation Strategy

**COST** ₹ ○ ○ ○ ○

**IMPACT** ★ ★ ★ ★ ○


WILDCARD
COST
IMPACT
© BuroHappold Engineering 2015


# FRESH AIR CORRIDOR PROVISION

*The site layout of the Industrial Park should consider the micro climate and allow for fresh air to enter, improving the quality of the open spaces as well as the well-being of employees. A fresh air corridor provides the site with sufficient air circulation and regulates the temperature in a natural way. Proper building orientation and sufficient building density can further increase the impact and effectiveness of fresh air corridors.* *(DGNB Reference ENV 1.5)*

Urban Framework

Ventilation

Building Orientation

**COST** ₹ ○ ○ ○ ○

**IMPACT** ★ ★ ★ ○ ○


# EARTHQUAKE AND FLOOD RISK ASSESSMENT

*More than 58 percent of India's land area is under threat of moderate to severe earthquakes. Every year about 30 million people are affected by flood related events with the area vulnerable to flooding encompassing 40 million hectares. A comprehensive risk assessment evaluating earthquake, flood and other potential risks can support the decision-making process for siting of new developments.*

*(DGNB Reference ENV 1.6)*

Flood Protection

Management Of Stormwater

Earthquake Protection

**COST** ₹ ○ ○ ○ ○

**IMPACT** ★ ★ ★ ★ ○


## BROWNFIELD REDEVELOPMENT

*The reuse and redevelopment of brownfield properties, sites that have seen a previous use and possibly contamination, is an effective method for reducing land use consumption. Additionally it provides benefits to the community, including the removal of soil contaminants, that help to protect human health and the larger environment.* *(DGNB Reference ENV 2.3)*

Soil Management

Toxic Waste Reduction

Talent Retention

**COST**

**IMPACT**


## LOCAL FOOD PRODUCTION

*Locally-produced food is inherently sustainable in that it has travelled only a short distance from pasture or kitchen to consumer. Beyond this, local food is usually fresher, and supports regional agriculture and businesses. Industrial districts can help employees access local foods by purchasing local foods or encouraging distributors to sell on-site.*

Cost Cutting

Preservation of Agriculture

Well-being

**COST**

**IMPACT**


# LIMIT GROUNDWATER EXTRACTION

*Groundwater extraction is the process of using groundwater for industry, irrigation, flood control or treatment. A natural resource particularly valuable in regions with limited surface water, groundwater can be found between soil particles and in rock formation fractures or aquifers. However, groundwater depletion is a serious concern in cases of excessive groundwater pumping and strategies limiting extraction must be put in place.*

*(DGNB Reference ENV 2.2)*

Resource Monitoring

Drip Irrigation

Irrigation Systems

**COST** ₹ ₹

**IMPACT** ★ ★ ★ ★


## RESOURCE MONITORING

*Monitoring – whether for economic performance, quality management, or operational process – is a critical aspect of running any business. An industrial district should monitor and record inputs and outputs, financials, energy usage and environmental performance, to maintain operational efficiency and provide opportunities to learn from past scenarios.*

*(DGNB Reference ENV 1.2 & ENV 1.7)*

ISO 9001
Quality Management

Cost Cutting

Joint Purchasing

**COST** ₹ ₹

**IMPACT** ★ ★ ★ ★


## SOIL MANAGEMENT

*Construction projects require a soil management plan to ensure that soil resources are not lost, damaged or contaminated. The plan should consider haul routes, topsoil and subsoil types, material volumes and plans for soil improvement. In particular, topsoil should be preserved as it is a finite and valuable resource.*

*(DGNB Reference ENV 2.4)*

Safe, Clean Construction

EIA

Environmental Impact Assessment

Soil Monitoring

**COST** ₹ ₹ ₹

**IMPACT** ★ ★ ★ ★


## BUSINESS INCUBATOR

*Larger industrial districts may choose to support, or incubate, small or new businesses which present long-term opportunities for synergy. Business incubation may comprise providing a start-up with space on an industrial park, advising the founders, providing seed funding or collaborating on a pilot project.*

Business Clustering

Seed Funding

Diversification

**COST** ₹ ₹ ₹

**IMPACT** ★ ★ ★


## DATA SECURITY

*Data security involves protecting internal data and avoiding unauthorized access to company computers, databases or servers. Data security is crucial to the successful management of a business and its operations, and the process guards against both data corruption and unintended data distribution.*

Corporate Data Systems

Virtual Communication

Investment Safety

**COST**

**IMPACT**

# GPI

GREEN PRODUCTION INDEX

GPI

## GREEN PRODUCTION INDEX

*A Production Index measures manufacturing production outputs and puts them in context of national or international economic outputs, using Key Performance Indicators (KPIs) to measure productivity and efficiency. A Green Production Index then also measures the environmental friendliness of a product, considering lifecycle costs, materials used and energy-efficient processes.*

CSR

Corporate Social Responsibility

Lifecycle Awareness

Sustainable Procurement

**COST** ₹ ₹

**IMPACT** ★ ★ ★ ★


## HEALTH COVER

*Although India broadened public health insurance provisions in 2010, many families still personally cover their healthcare expenses. When industrial districts provide health insurance for employees and their families, they can expect better employee health and thus a lower absentee rate and better workplace satisfaction.*

Talent Retention

Well-being

Compassion for Employees

**COST** ₹ ₹ ₹ ₹

**IMPACT** ★ ★ ★ ★


## HONEST BROKER

*An honest broker is an independent individual who investigates complaints or problems about an organisation or company. As a neutral party, the honest broker is able to mediate between a company and an individual and find a fair and honest solution. This role may be best filled through the Industrial Park Management team, to ensure both neutrality and knowledge of the overall context of the Industrial District.*

Women's Empowerment

Industrial Zone Management

Ombudsman

**COST** ₹ ○ ○ ○ ○

**IMPACT** ★ ★ ★ ★ ○


## INDUSTRIAL MATERIALS MINING

*Many of the materials needed for an industrial process may already be on site or available via an industrial facility, park or broader partner networks. By "mining" available resources in-house or materials used in the production process, industrial parks can be more efficient and even reduce waste. The phrase can also refer to "mining" employee expertise, and learning more about ways to better the production process through the knowledge already on site.*

Industrial Symbiosis

Upcycled Materials

Recycling

**COST** ₹ ○ ○ ○ ○

**IMPACT** ★ ★ ★ ○ ○


## OMBUDSMAN

*The Ombudsman Office is an independent, neutral and confidential place for visitors to discuss their workplace issues and concerns. This office should be informal, assure confidentiality, and be independent of the Industrial Park and the local administration. It is open and accessible to all workers, trainees, faculty, staff, students and retirees.*

One Stop Shop
Retail Access

Work-Life
Balance

Compassion for
Employees

**COST**

**IMPACT**


## OPEN - SOURCE INFORMATION

*Whether collected via the public or a smaller community such as a company, Open Source Information is crowd-sourced, with a variety of individuals able to share knowledge and give input. For example, open source information platforms, such as Wikipedia, allow any registered user to log in and contribute. The model can be carried out in an industrial setting, with individuals able to contribute ideas to knowledge or procedural databases.*

E-consensus Platform

Participatory Planning

Broadband Infrastructure

**COST** ₹ ○ ○ ○ ○

**IMPACT** ★ ★ ○ ○ ○


## OPTIMISED DECISION MAKING

*Optimised decision making describes an optimisation process for considering and prioritising all options to rectify existing or potential performance failure of assets. It helps to improve the entire performance of a company within the Industrial Zone. Combined with a 'lessons learned' approach it can provide invaluable benefits to the operation of individual industries.*

Corporate Data Systems

Leadership

Productivity

**COST**

**IMPACT**


## POLLUTER PAYS PRINCIPLE

*The Polluter Pays Principle is an aspect of environmental law which holds parties responsible for environmental damage caused by materials production, distribution or disposal. This "eco tax" is designed to lower greenhouse gas emissions and otherwise encourage environmental responsibility. It can take the form of financial contributions, as well as waste management "buy back" programs.*

Lifecycle Analysis

Producer Responsibility

Environmental Stewardship

**COST** ₹ ₹ ₹

**IMPACT**


## REMOTE SERVICES

*Remote Service is the combination of hardware and software which enables remote access to information or tools within an IT network. For example, through Remote Service, disparate employees can connect to a host computer. Remote Service provides employees, clients and customers with more efficient services and can then lead to other productivity improvements. Cloud Computing then continues to build from the advances and opportunities developed by remote assistance technologies.*

Cloud-based Systems

Support/ Helpdesk

Apps

**COST** ₹ ₹ ○ ○ ○

**IMPACT** ★ ★ ★ ○ ○


# BIG DATA

*Big Data is a term which refers to the potential for large, complex data sets to be analysed for patterns. These data sets may address operations, purchasing or the supply chain, for example, with analysis determining strategies for streamlining operations or better matching products with customer needs. However, data security and privacy issues must be fairly considered and addressed by any company intending to use Big Data.*

Corporate Data Systems

Dynamic Production

Internet of Things and Services

**COST** ₹ ₹ ₹

**IMPACT** ★ ★ ★ ★


## BROADBAND INFRASTRUCTURE

*Broadband infrastructure allows for high-speed data transmission, often using a wide range of frequencies. In general, the wider a channel's bandwidth, the greater its information carrying capacity is. Broadband can enable the swift and simultaneous transmission of a high volume of data, contributing to efficient company operations.*

Virtual Communications

IT Management

Good Building Design

**COST** ₹ ₹ ₹

**IMPACT** ★ ★ ★


## CLOUD BASED SYSTEMS

*Accessed via the Internet, cloud-based systems comprise data sets or applications connected via remote servers and software networks. Using "the Cloud" enables centralised data storage, and connectivity to resources from different locations. Cloud-based systems can increase capacity and allow for greater flexibility in terms of online access to servers, storage and applications from multiple locations.*

Remote Services

IT Management

Internet of Things and Services

**COST** ₹ ₹

**IMPACT** ★ ★ ★


## CORPORATE DATA SYSTEMS

*A data system comprises the network of communication channels operating in a business or organization, all of which must remain secure to ensure business health. Any business should include a variety of data systems and streams, applied to manufacturing processes, logistics planning and market strategy. Coordinating these data systems with operations will improve business planning and opportunities.*

Data Security

Dynamic Production

Cyber Physical Systems

**COST** ₹ ₹

**IMPACT** ★ ★ ★ ★


# CREATIVE VALUE - ADD

*Creative Value-Add refers to the creative or innovative enhancement that a company gives to its product or services to differentiate them from the competition. Creative Value-Add can lead to brand loyalty, and develop long-term customers willing to pay more for a product or service.*

Unique Products

Branding & Identity

Company Recognition

**COST**

**IMPACT**


## HORIZONTAL INTEGRATION

*Horizontal integration is a business strategy, by which a company acquires outside production units which are alike, whether competitive or complementary. Because the units are involved in a similar type of production process, horizontal integration allows for the economies of scale and the sharing of resources. This may also be described as a merger, or in extreme circumstances, a monopoly.*

Growth Management

Industrial Park Business Strategy

International Competiveness

**COST** ₹ ₹

**IMPACT** ★ ★ ★


# JOINT PURCHASING

*Joint purchasing is a type of cooperation between two organisations, in which they create a purchasing group to buy supplies at a higher volume, and thus as a lower price. By increasing the scale of operations, joint purchasing can lead to cost savings and efficiency, although it can also reduce flexibility.*

Joint Ventures

Sustainable Procurement

Business Clustering

**COST** ₹ ○ ○ ○ ○

**IMPACT** ★ ★ ★ ○ ○


# RAPID PROTOTYPING

*Rapid prototyping is the fast creation of a scale model using Computer Aided Design (CAD) data or 3-D printing. Rapid prototyping can be used to create visualisations of a product, or to test out a part or product design before creating it in large quantities. The process can greatly improve efficiency in the manufacturing process, improving and speeding up design and avoiding costly mistakes.*

Custom Manufacturing

Unique Products

Lean Manufacturing

**COST** ₹ ₹ ₹

**IMPACT** ★ ★ ★ ★


## RESOURCE PRODUCTIVITY

*Resource productivity is a key concept used in sustainability measurement as it attempts to de-couple the direct connection between resource use and environmental degradation. Its strength is that it may be used as a metric for both economic and environmental cost. The efficiency of resource production as outcome per unit of resource use (resource productivity) and the efficiency of resource consumption as resource use per unit outcome (resource intensity) are its parameters. The sustainability objective is to maximise resource productivity while minimising resource intensity.*

Minimised Non-Recyclable Goods

Waste Management and Reduction

Resource Integration

**COST** ₹ ○ ○ ○ ○

**IMPACT** ★ ★ ★ ○ ○


## SHARING ECONOMY

*The Sharing Economy is a relatively recent concept, in which information technology enables individuals or groups to share excess goods or services and thus avoid individual purchases. The concept can apply to cars, bikes, temporary accommodation and other options. For example, for an industrial district, sharing transport vehicles could save costs and reduce emissions.*

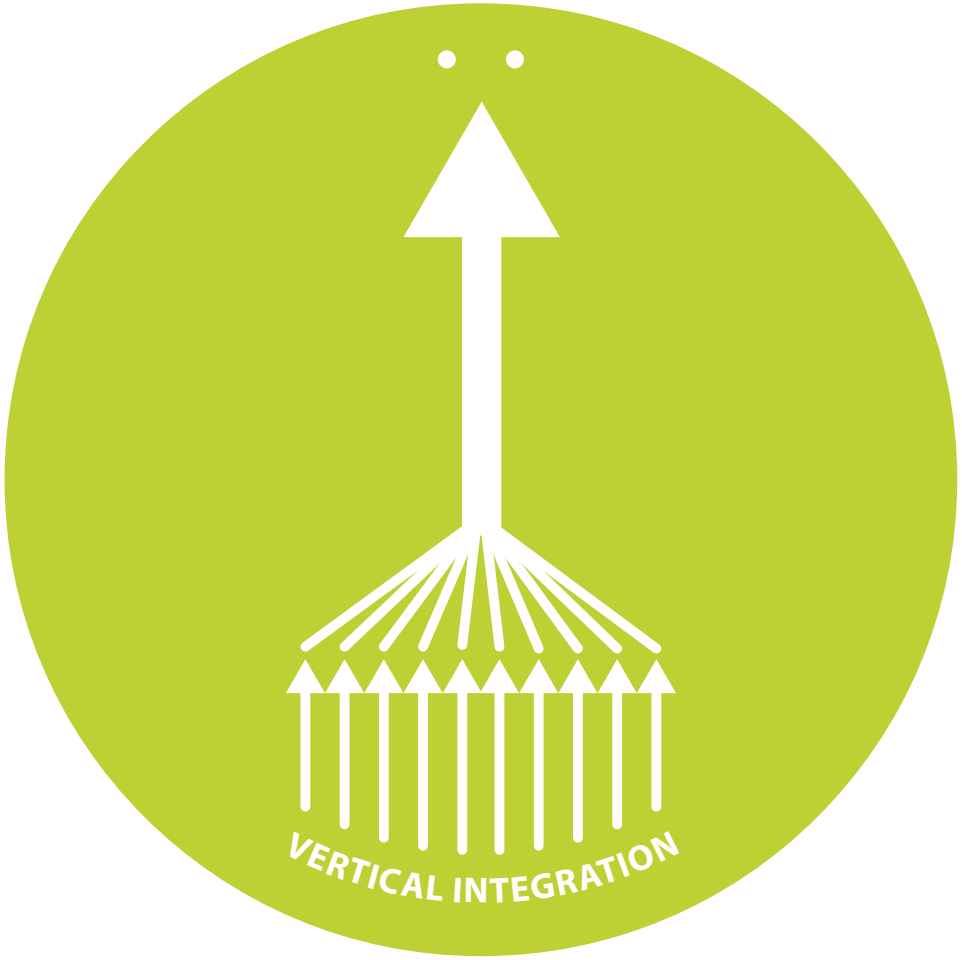
Multi-modal Transport

Rental & Ownership Structure

Scooter Share

**COST**

**IMPACT**




# VERTICAL INTEGRATION

*Vertical integration is a practice by which a company expands operations into areas along different points of the product cycle. For example, vertical integration occurs when a manufacturer begins managing product distribution channels or materials sources. By reducing costs, transportation and turn-around time, vertical integration can improve efficiency, although it is not cost-efficient in every instance.*

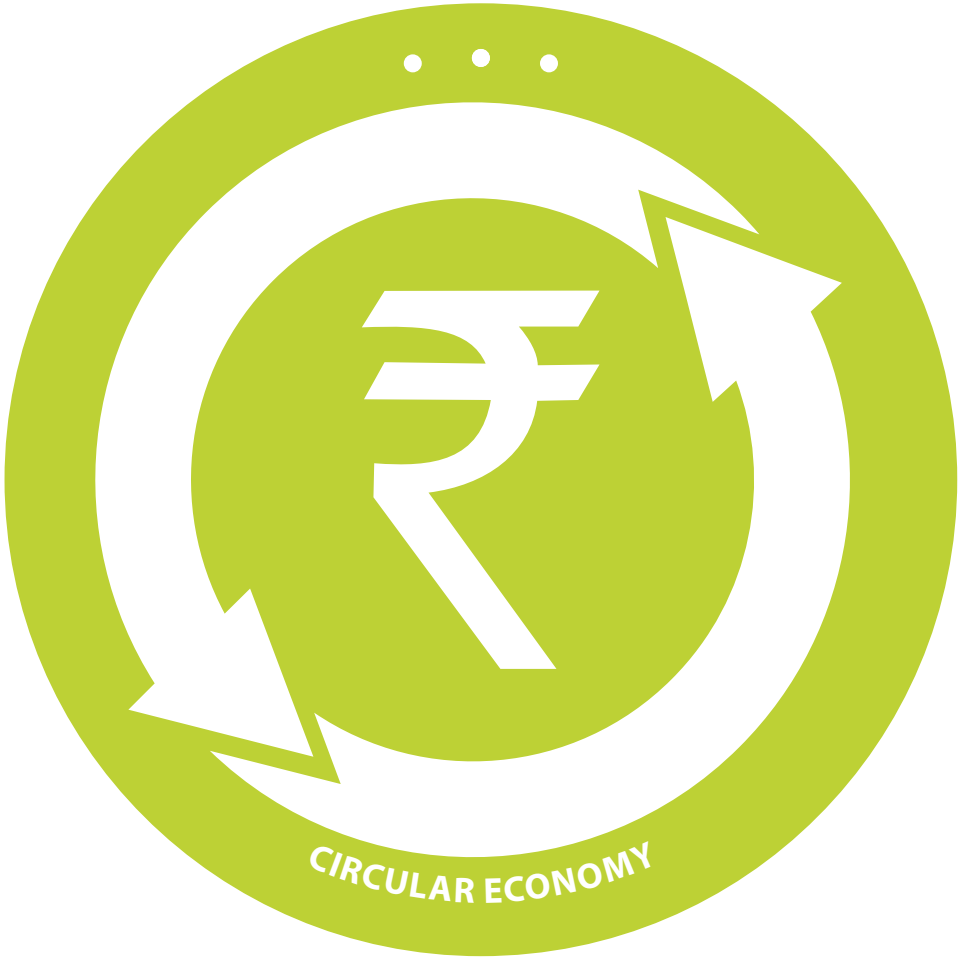
Growth Management

Sustainable Procurement

Diversification

**COST** ₹ ₹ ○ ○ ○

**IMPACT** ★ ★ ★ ○ ○




## CIRCULAR ECONOMY

*The Circular Economy refers to systems which are designed to be restorative in nature, keeping products in use for as long as possible and utilizing the principles of recovery and regeneration. Following the principles of the Circular Economy preserves resources, reduces waste and can lead to higher quality products.*

Upcyled Materials

Making Use of Synergy

Industrial Symbiosis

**COST**

**IMPACT**


## CUSTOM MANUFACTURING

*Custom Manufacturing is the business of making unique, new products based on customer specifications. The opposite of mass production, custom manufacturing responds to customers' design interests, and thus often commands a premium. Although it requires additional investment and flexibility, custom manufacturing should lead to better turnover and fewer waste materials, and should allow companies to better take advantage of new technologies. The opportunity is especially interesting for micro enterprises that can easily switch towards bespoke products.*

Unique Products

Rapid Prototyping

Business Incubator

**COST** ₹ ₹ ₹ ₹

**IMPACT** ★ ★ ★ ★


## CUSTOMER FOR LIFE

*Creating innovative, high-quality products can lead to long-term customer loyalty. Corporate branding and recognition are also likely to contribute to this phenomenon. Developing complementary products with natural synergies can also keep customers engaged and likely to update or expand on initial purchases.*

Children's Nursery Provision

Branding & Identity

Cost Stability

**COST** ₹ ₹ ₹

**IMPACT** ★ ★ ★ ★ ★


## CYBER - PHYSICAL SYSTEMS

*Cyber-Physical Systems are "smart machines," or physical systems linked to real-time, networked information. Cyber-physical systems can be manufacturing systems, production facilities, or storage facilities able to exchange information or process third-party business information. These linkages to online networks can lead to extraordinary efficiency improvements for manufacturing, logistics and distribution.*

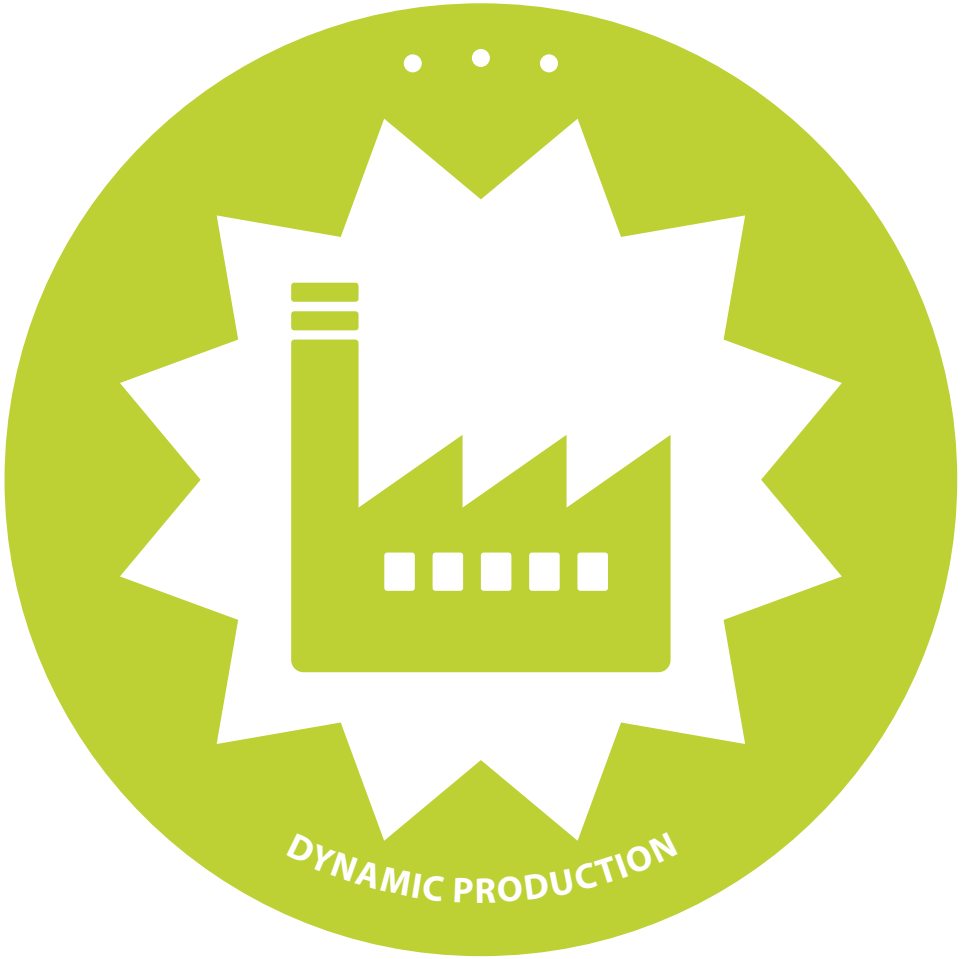
M2M
(Machine to Machine)

Dynamic
Production

Resource
Monitoring

**COST** ₹ ₹ ₹ ₹

**IMPACT** ★ ★ ★ ★




## DYNAMIC PRODUCTION

*Dynamic production, also often referred to as advanced manufacturing, is the use of networked technology to improve the industrial processes and better respond to demands and customer needs. The approach uses external data to be more responsive in developing modified products or reconfiguring logistical arrangements, allowing businesses to be more flexible and efficient.*

Custom Manufacturing

Productivity

M2M (Machine to Machine)

**COST** ₹ ₹ ₹ ₹

**IMPACT** ★ ★ ★ ★


## INTERNET OF THINGS & SERVICES

*The Internet of Things is a network of physical objects, connected by software or internet infrastructure. This connection enables the sending and receiving of data, achieving greater value and productivity for the network as a whole.*

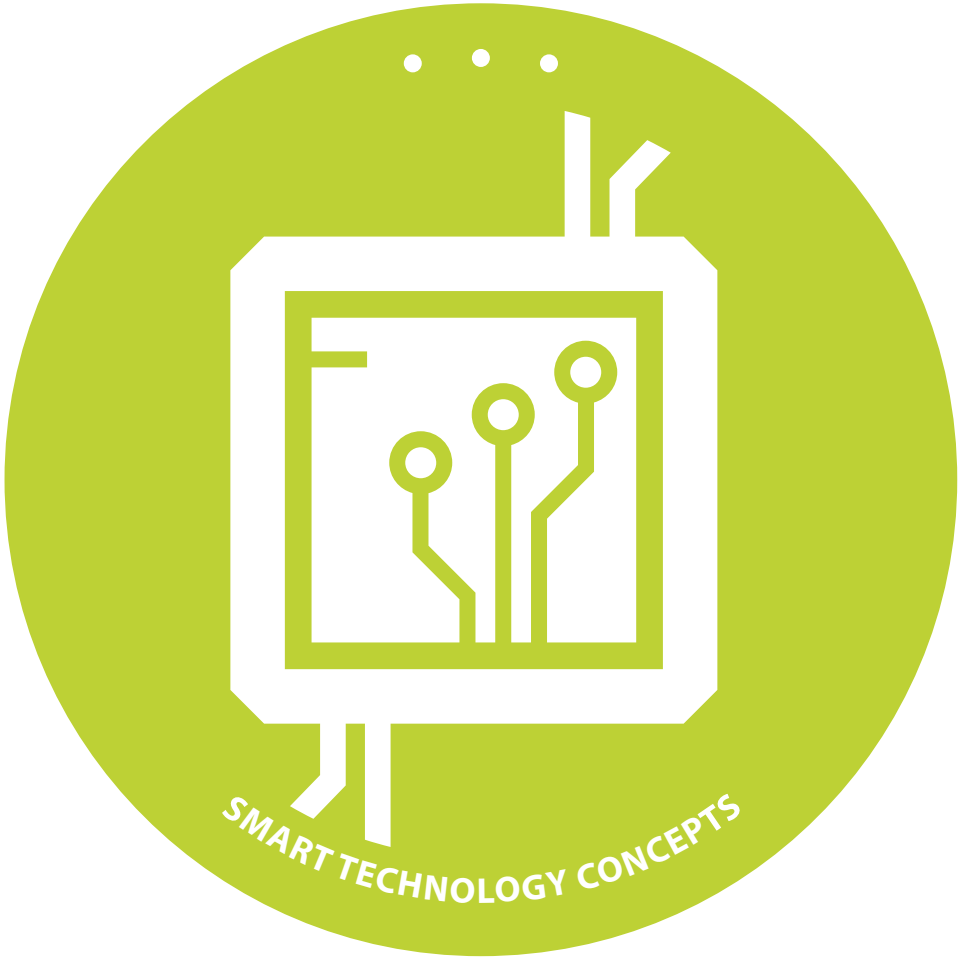
Broadband Infratructure

Dynamic Production

Cyber Physical Systems

**COST** ₹ ₹ ₹ ₹

**IMPACT** ★ ★ ★ ★




# SMART TECHNOLOGY CONCEPTS

*Smart technology deals with "squeezing" performance improvements out of all technical components such as the electric grids, transportation networks, water supply, etc. by trying to align constrained supply with erratic demand systematically. In practice, the use of smart technology deals mostly with harnessing a combination of IT products - sensors, monitoring systems, automated controls, modeling and other decision-support applications - more intelligently.*

Systems Connectivity

M2M (Machine to Machine)

Broadband Infratructure

**COST** ₹ ○ ○ ○ ○

**IMPACT** ★ ★ ★ ★ ○


## LEAN MANUFACTURING

*Lean Manufacturing is a business improvement tool that seeks to eliminate waste within the manufacturing process. The school of thought seeks to reduce all the "unnecessary" portions of a process or product, to focus on what adds the most value for the customer. The essence of "lean" manufacturing is both understanding customer interests and delivering the product efficiently and profitably.*

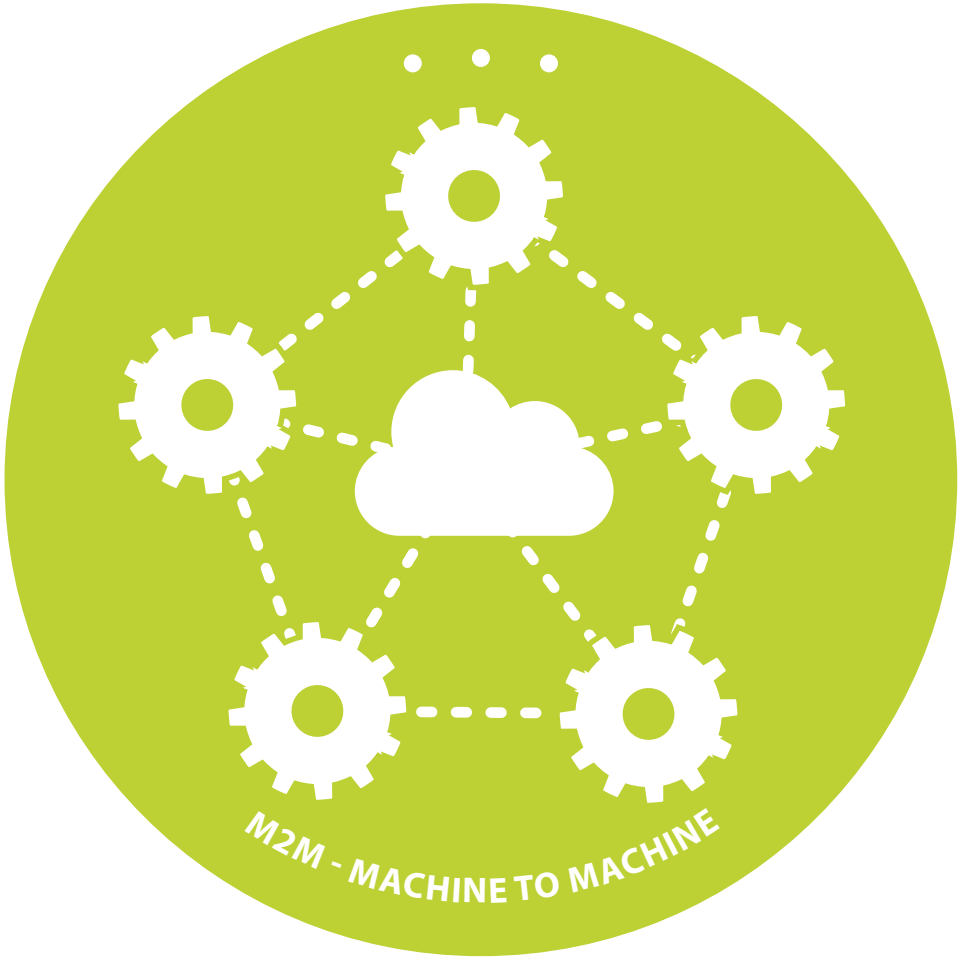
Rapid Prototyping

Industrial Park Business Strategy

By-Product Connections

**COST** ₹ ₹ ₹

**IMPACT** ★ ★ ★ ★




## M2M - MACHINE TO MACHINE

*M2M, or machine-to-machine communication, refers to technologies that allow both wireless and wired systems to communicate with other devices of the same type, in real time. M2M is considered an integral part of the Internet of Things (IoT) and has a wide range of applications such as industrial automation, logistics and Smart Grids.*

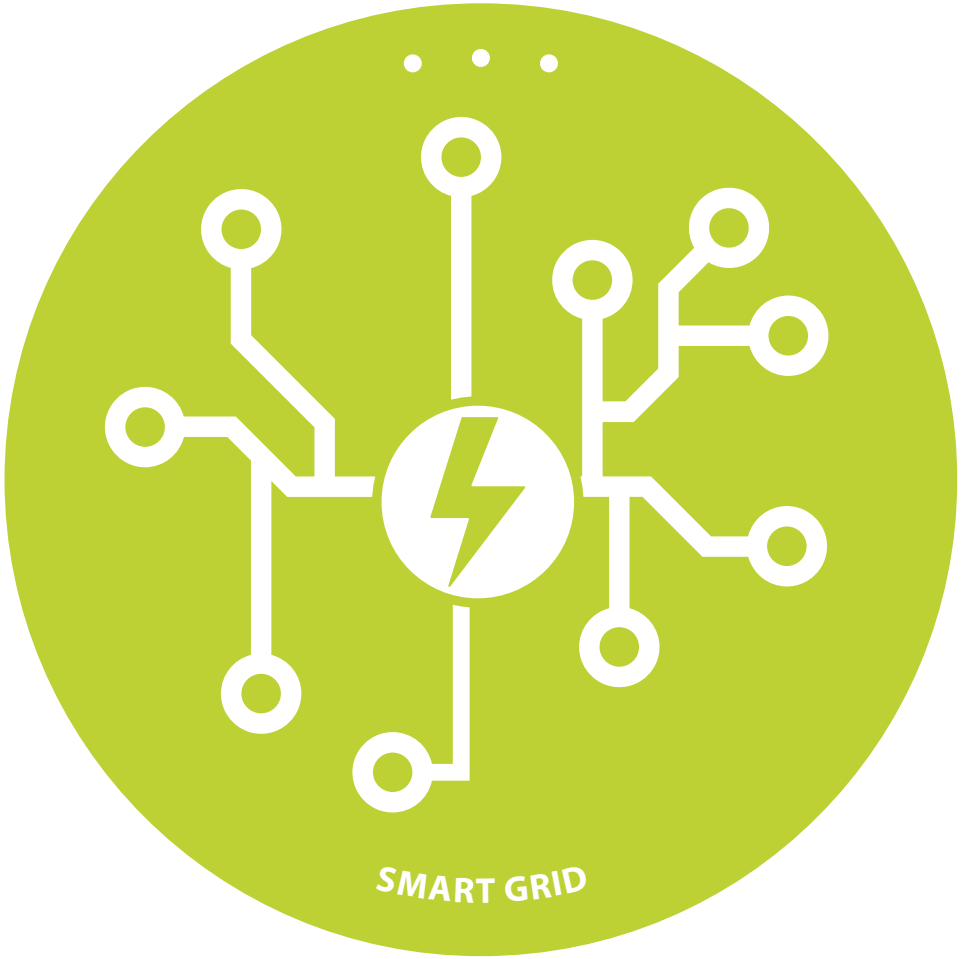
Smart Grid

Internet of Things and Services

Cyber Physical Systems

**COST** ₹ ₹ ₹ ₹

**IMPACT** ★ ★ ★ ★




## SMART GRID

*A Smart Grid is a type of electrical grid that uses digital information and technology to follow consumer and supplier need in order to improve the efficiency of electricity production and distribution. Not necessarily a large-scale investment, Smart Grids represent a step change in the electrical services industry and offer a great opportunity for increased resiliency and more sustainable energy production for pioneer enterprises in the industrial district.*

Grid Electricity

Clean Energy Strategy

Battery Based Systems

**COST** ₹ ₹ ₹ ₹

**IMPACT** ★ ★ ★ ★ ★


## VALUE NETWORKS

*A Value Network comprises the connections, social and technical resources shared within businesses, between businesses, or within supply chains. Value Networks are a type of economic ecosystem, where members are interdependent and interact to the benefit of the entire group. To foster a value network, businesses should look for synergy with complementary suppliers, businesses and collaborators, with value generated through efficiency, financial return and knowledge generation.*

Sustainable Procurement

Making Use of Synergy

Industrial Symbiosis

**COST** ₹ ₹

**IMPACT** ★ ★ ★ ★

## WILDCARD

COST

IMPACT




## COLLABORATION AMONG INDUSTRIES

*Collaboration, among industries and within project teams, is a critical aspect of good governance and people management. An iterative process, collaboration includes working together and exchanging ideas in pursuit of shared goals. The approach is not only effective but also likely to increase employee satisfaction with the workplace.* *(DGNB Reference PRO 1.6)*

Proximity to Partners

Business Clustering

Making Use of Synergies

**COST** ₹ ○ ○ ○ ○

**IMPACT** ★ ★ ★ ★ ○


## COMPLIANCE

*Compliance refers to adherence to policies and laws, whether regarding labour, accounting, business practice or governance. Compliance to local, state, national and international standards is key to the operations of any industrial district, both with regards to safety standards and with regards to business strategy.*
*(DGNB Reference PRO 2.1)*

ISO 9001
Quality Management

Investment Safety

International Competiveness

**COST**

**IMPACT**


## EARTHQUAKE PROTECTION

*Much of India is susceptible to earthquakes, and so earthquake preparedness is key to any industrial park resiliency strategy. Industrial Districts should have plans and procedures in place in the event an earthquake strikes, and should ensure employees are familiar with these. Buildings should also be constructed to the appropriate resiliency standard.* *(DGNB Reference ENV 1.6)*

Earthquake & Flood Risk Assessment

Industrial Disaster Risk Management

Good Building Design

**COST** ₹ ₹ ○ ○ ○

**IMPACT** ★ ★ ★ ★ ○

EIA

ENVIRONMENTAL IMPACT ASSESSMENT

EIA

## ENVIRONMENTAL IMPACT ASSESSMENT

*Environmental Impact Assessment (EIA) is the process of determining the potential environmental consequences of a project, development or process. An EIA should ideally be undertaken before the start of a new building project or investment, followed by the creation of a strategy to mitigate these environmental concerns.* *(DGNB Reference PRO 2.2)*

Air Quality Monitoring

Soil Managment

Environmental Stewardship

**COST** ₹ ₹ ○ ○ ○

**IMPACT** ★ ★ ★ ★ ★


# INDUSTRIAL DISASTER RISK MANAGEMENT

*Disaster Risk Management includes identifying, understanding and addressing possible risks, to maximise resiliency and the overall likelihood of objectives being achieved. In the industrial context, Disaster Risk Management addresses all issues related to relevant industrial and manufacturing processes, considering both production and economic risks and addressing them.*

Earthquake & Flood Risk Assessment

Earthquake Protection

Adaptation Strategy

**COST** ₹ ₹ ○ ○ ○

**IMPACT** ★ ★ ★ ★ ★


## INDUSTRIAL PARK BUSINESS STRATEGY

*Beyond individual companies, industrial parks as a whole should have a business strategy which takes into account all of the uses and activities on site. The strategy should identify opportunities for savings and synergies and should consider clustering, industrial symbiosis and the distribution, production and disposal of materials. An Industrial Zone Manager may lead such a strategy, with input from all companies based on site. ((DGNB Reference PRO 1.7)*

Business Clustering

Industrial Symbiosis

Location

**COST** ₹ ₹

**IMPACT** ★ ★ ★ ★ ★


# INDUSTRIAL ZONE MANAGMENT

*Industrial Zone Management is a management entity within an industrial park, which not only leads on operations and maintenance but also evaluates and provides leadership on broader governance issues. Industrial zone managers are aware of the environmental performance of a district, can make the case for expansions or renovations and can otherwise introduce innovations to facilities or processes.* *(DGNB Reference PRO 3.1)*

Environmental Stewardship

Collaboration Among Industries

Phasing

**COST**

**IMPACT**


# IT MANAGMENT

*Information Technology is increasingly important to the operations and day-to-day management of any industrial district. A comprehensive IT Management strategy ensures that companies make the most of the opportunities presented by IT, considering varying costs, needs and priorities. An IT Management strategy can also ensure that technology is up to date, with synergies exploited to their full potential.*

Broadband Infrastructure

Data Security

Industrial District Wi - Fi

**COST** ₹ ₹ ○ ○ ○

**IMPACT** ★ ★ ★ ★ ○


## LEGISLATION

*Industrial Districts need to be compliant with Indian, and where appropriate, international legislation. Key areas of focus include labour, factory and contract conditions, as well as environmental emissions and impact. In-house or external legal advisors can assist industrial district managers with legal queries related to compliance.*

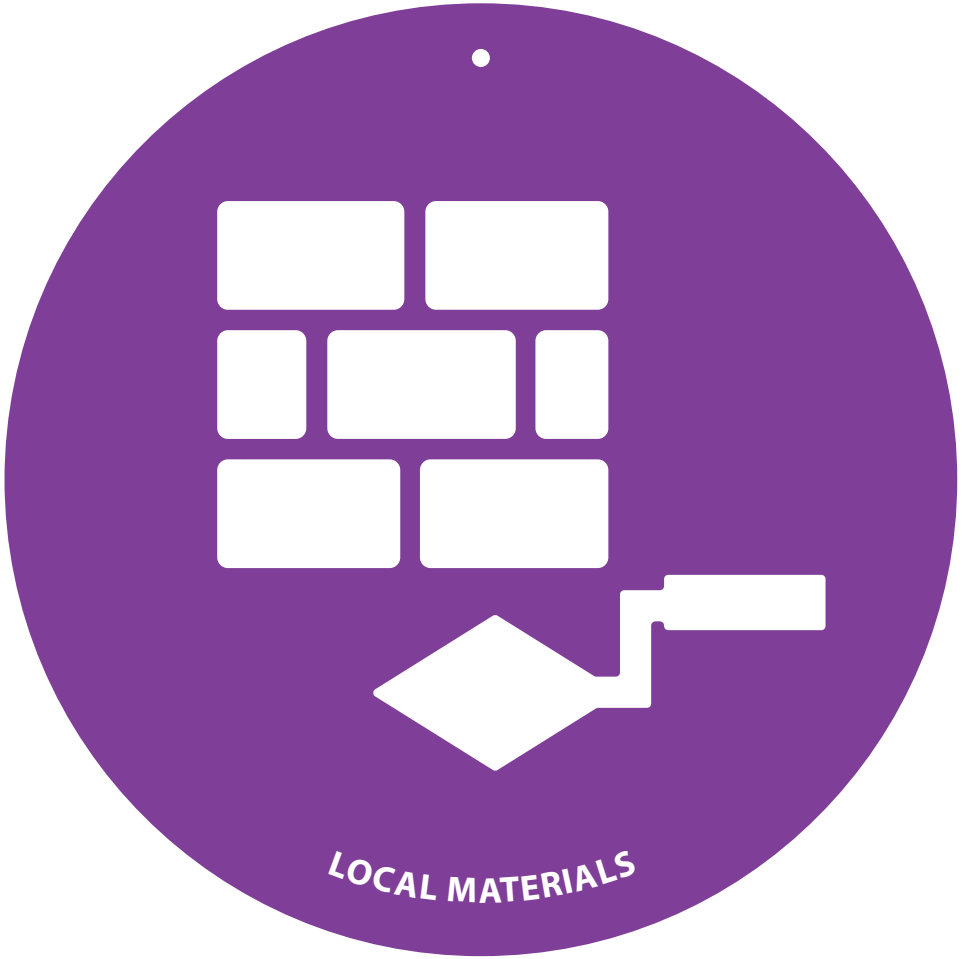
Environmental Stewardship

Elimination of Child Labour

Investment Safety

**COST** ₹ ₹ ₹

**IMPACT** ★ ★ ★ ★ ★




## LOCAL MATERIALS

*Using local and low-impact materials can greatly reduce the carbon footprint of a new facility. Ideally, materials should be sourced locally, reducing transportation costs and supporting local economic development. Low-impact materials might even have other environmental benefits like recycled content, permeable or high albedo surfaces.*

Sustainable Procurement

Smart Material Selection

Recycling

**COST** ₹ ₹ ○ ○ ○

**IMPACT** ★ ★ ★ ★ ○


## PARTICIPATORY PLANNING

*Participatory Planning is an urban planning strategy which brings the broader community into a strategic decision-making process, with pro-active opportunities for stakeholder involvement. This bottom-up planning strategy should involve neighbouring communities, local social groups, political representatives, relevant business stakeholders and stakeholders within a company.*

*(DGNB Reference PRO 1.6)*

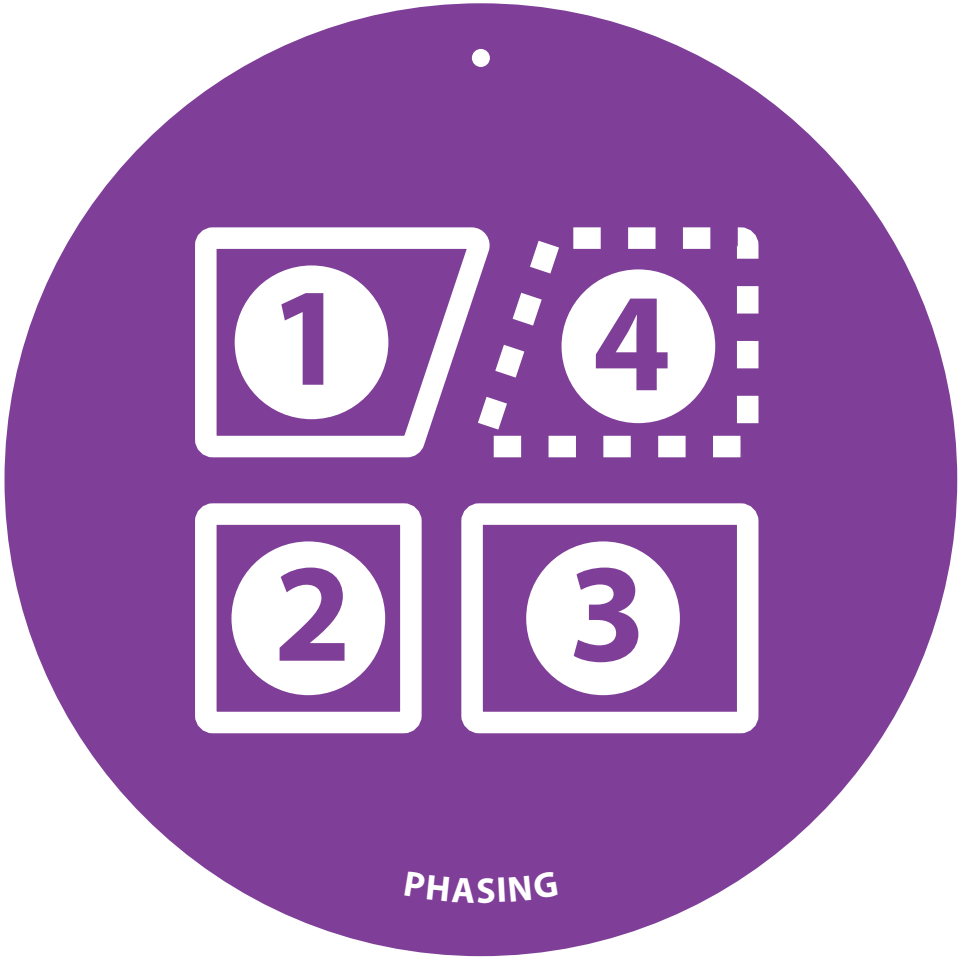
E - Consensus Platform

Community Relationship

Honest Broker

**COST** ₹ ○ ○ ○ ○

**IMPACT** ★ ★ ★ ○ ○




## PHASING

*Investment or growth plans for industrial districts should be phased for maximum efficiency and investment safety. Phasing can reduce risk,as well as disturbance to operations, particularly for investment in physical facilities and more sustainable technologies.*

*(DGNB Reference PRO 2.1)*

Business Clustering

Growth Management

Industrial Zone Managment

**COST**

**IMPACT**


# PROJECT SCHEDULING

*Successful projects start with a good quality project schedule. Proper project scheduling enables multiple construction operations to happen at the same time without compromising each other. It can include Industrial Park wide Event Plans involving company creation or expansion/modernization. Creating a schedule is one of the first tasks you should do when given a project to manage in an industrial environment looking at the background, objectives, scope, constraints, assumptions, risks and deliverables as well.* *(DGNB Reference PRO 2.4)*

Reputation Management

Collaboration Among Industries

Phasing

**COST** ₹ ○ ○ ○ ○

**IMPACT** ★ ★ ★ ★ ★


## SAFE CLEAN CONSTRUCTION

*A key aspect of a green facility is a sustainable, clean and safe construction process. During construction, a site should remain in good condition, to minimize health risks for construction workers and those living or working nearby. Issues to consider include on-site storage areas, pedestrian routes, flammable materials and waste management.* *(DGNB Reference PRO 2.1)*

Workplace Safety

Industrial Disaster Risk Management

Air Quality Monitoring

**COST** ₹ ₹ ₹ ○ ○

**IMPACT** ★ ★ ★ ★ ★


# TRANSPARENCY

*Transparency is a key part of best management practice and entails honesty and disclosure between corporate management and employees. Transparency allows for practices, agreements and transactions to be understood by all, with the rules and regulations behind company practice clear to all participants.*

Leadership

E-consensus Platform

Investment Safety

**COST**

**IMPACT**


# BUILDING INVENTORY

*Prior to the retrofitting of an Industrial Park an inventory of its buildings and current use will set the baseline for development. An evaluation of the building stock should be done by an independent consultant that looks at the building quality, level of wear, age and use to provide a good basis for updates within the Park and to earmark areas for redevelopment within the existing district.*

*(DGNB Reference PRO 2.1)*

Brownfield Redevelopment

Informal Housing Upgrade

Reduced Demolition

**COST** ₹ ₹

**IMPACT** ★ ★ ★ ★


## CAPACITY DEVELOPMENT

*Industries should be actively involved in local capacity development, ensuring that paths to employment exist for local people. This may include providing input into existing training and apprenticeship programs, or sponsoring students in these programs who then commit to subsequent work at the industrial district.*

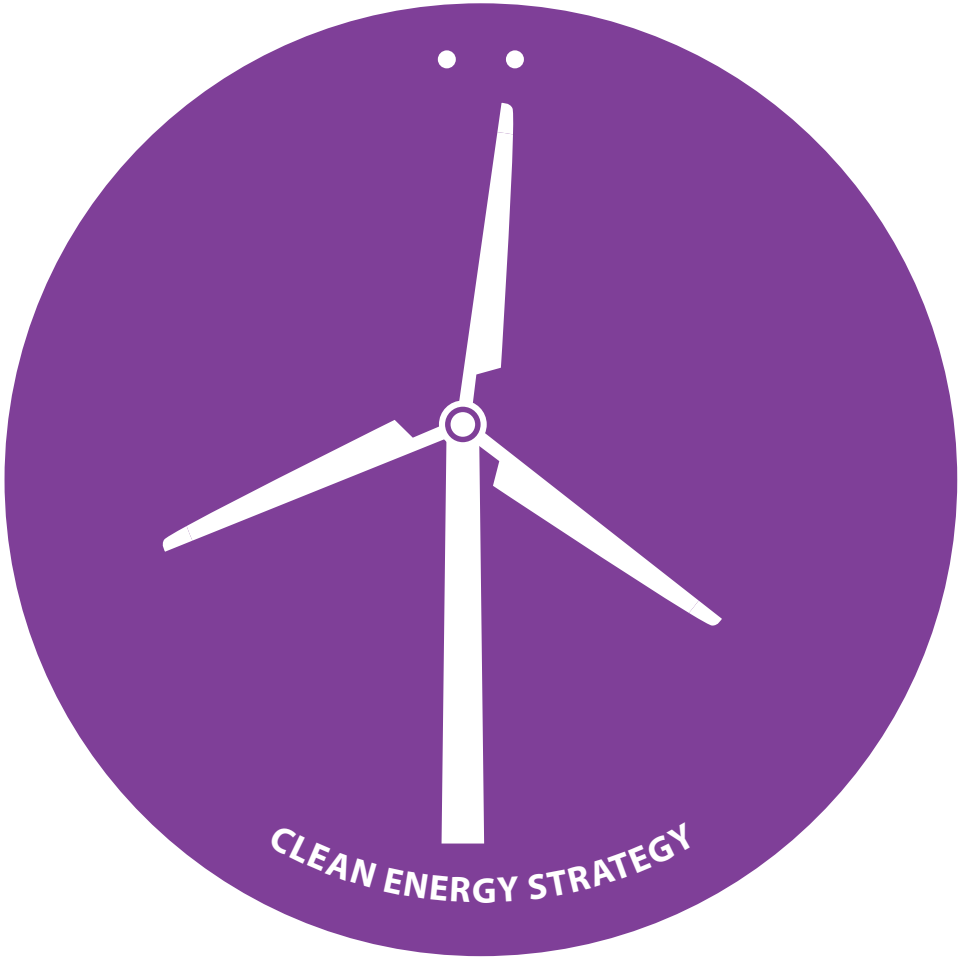
Community Relationships

Growth Managment

Talent Retention

**COST**

**IMPACT**




## CLEAN ENERGY STRATEGY

*Industrial Parks should create a park-wide clean energy strategy, considering how the park as a whole can utilise renewables and decrease carbon emissions. Some technologies may be more affordable or implementable when considered on a Park-wide scale, as opposed to for a single company. The strategy should also consider how to encourage sustainable behaviour among employees.*

CSR
Corporate Social Responsibility

Minimisation of Greenhouse Gases

Making Use of Synergies

**COST** ₹ ₹ ₹ ○ ○

**IMPACT** ★ ★ ★ ★ ★

CSR

CORPORATE SOCIAL RESPONSIBILITY

CSR

## CORPORATE SOCIAL RESPONSIBILITY

*Corporate Social Responsibility (CSR) is the practice of incorporating business ethics, self-monitoring and community engagement into business plans. Through CSR, companies take a proactive approach to their effects on the environment and social welfare, aiming to produce a positive impact on society beyond their immediate business objectives. Combining individual CSR efforts of enterprises within an Industrial District can allow for larger projects to be realised or to funnel finances towards strategic projects.* *(DGNB Reference PRO 2.2)*

Customer for Life

Compassion for Employee

Community Relationships

**COST** ₹ ₹

**IMPACT** ★ ★ ★ ★


## ECONOMIC ANALYSIS

*Any successful business requires substantial economic analysis, whether in the context of the supply chain, management structure, product development or marketing strategy. Business strategists should weigh business strengths, market trends, economic forces and technological advances as crafting strategies for the expansion, continuation or development of any industrial district.*

*(DGNB Reference PRO 2.4)*

Business Targets

Industrial Park Business Strategy

Growth Management

**COST**

**IMPACT**


TV

## EXTERNAL COMMUNICATIONS

*External communications include communications with the local community, public officials, agencies, investors and others. Industrial districts should keep their lines of communication open, particularly with regards to news relevant to the wider community and to compliance issues relevant to local authorities.*

*(DGNB Reference PRO 2.1)*

Reputation Management

Community Relationship

International Partnerships

**COST** ₹ ○ ○ ○ ○

**IMPACT** ★ ★ ★ ○ ○


## GREEN BUSINESS PLAN

*A Green Business Plan connects a business' economic goals with its environmental aspirations, addressing energy consumption, waste generation and employee travel, among other issues. The goal is to achieve environmental efficiency and a low carbon footprint in the context of a productive and prosperous business environment.*

*(DGNB Reference PRO 1.7)*

Environmental Stewardship

CSR

Corporate Social Responsibility

Sustainable Procurement

**COST** ₹ ₹ ○ ○ ○

**IMPACT** ★ ★ ★ ★ ○


# INTEGRAL PLANNING TEAM

*Living an integrated approach to planning means having experts involved from early on. There should be at least three different disciplines represented in the integral planning team. Out of the box thinking, the ability to work in a team and to be competent in communication are essential. The team should be coordinated by an experienced interdisciplinary expert that understands to fascinate and involve others.* *(DGNB Reference PRO 2.1)*

Environmental Stewardship

Systems Thinking

Honest Broker

**COST** ₹ ₹ ○ ○ ○

**IMPACT** ★ ★ ★ ★ ○


## INTEGRATION INTO REGIONAL STRUCTURES

*A new or expanding Industrial District should follow regional planning guidelines and economic patterns, to best serve the wider region and its economic strengths and needs. Working with regional municipal planners can also ensure that the required transport and infrastructure is in in place and compatible with the likely long-term growth of development in the area.*

Urban Framework

Location

Air Travel Connectivity

**COST** ₹ ○ ○ ○ ○

**IMPACT** ★ ★ ★ ★ ○


## PRODUCER RESPONSIBILITY

*Producer Responsibility holds manufacturers responsible for the impacts of their products or manufacturing processes, including related pollution or environmental impacts. Extended Producer Responsibility takes the concept a step further by holding producers responsible for the lifecycle aspects affiliated with their product and its packaging, creating an incentive to design with fewer toxins and better recycling opportunities.*

Polluter Pays Principle

Lifecycle Analysis & Costing

Community Relationship

**COST** ₹ ₹ ₹

**IMPACT** ★ ★ ★ ★ ★

PPP

PUBLIC PRIVATE PARTNERSHIPS

PPP

## PUBLIC PRIVATE PARTNERSHIPS

*Public Private Partnerships (PPP) are business relationships between governmental agencies and private sector companies, often undertaken for public interest projects. PPPs come in place for projects that normally would not be pursued by either public or private sectors, but that can be achieved in a combined manner to enable unusual or large-scale projects.*

International Competitiveness

Growth Management

Diversification

**COST** ₹ ₹ ○ ○ ○

**IMPACT** ★ ★ ★ ★ ○

# ISO 9001

QUALITY MANAGEMENT

ISO 9001

## QUALITY MANAGEMENT

*Quality Management (QM) helps companies to monitor and manage quality, to ensure a consistent product quality or process. An assessment standard, such as ISO 9001, typically considers quality planning, quality control, quality assurance and quality improvement processes in place and can be done on the industrial corporation level and beyond.*

Resource Monitoring

Efficient Use of Utilities

Regular Maintenance

**COST** ₹ ₹ ○ ○ ○

**IMPACT** ★ ★ ★ ★ ○


## REDUCED DEMOLITION

*Building demolition and subsequent reconstruction lead to substantial carbon and noise emissions and dust. By reducing demolition, a new construction project acknowledges the embodied energy in an existing building on site and works around it, finding reuse and rehabilitation opportunities for out-dated facilities rather than building new.*

Lifecycle Awareness

Recycling

Safe, Clean Construction

**COST** ₹ ₹

**IMPACT** ★ ★


## REVITALISATION PROCESS

*Revitalisations, or renovations, present opportunities to introduce new technologies to decrease energy use, increase efficiency and improve employee experience. Any revitalisation must be complemented by regular maintenance, as well as financial analysis of gains achieved through capital expenditure.*

Upgraded Energy Production

Green Building

Safe, Clean Construction

**COST** ₹ ₹ ₹ ₹

**IMPACT** ★ ★ ★ ★


## SMART MATERIALS SELECTION

*Building materials are a key aspect of the carbon footprint of new construction, whether considering materials origins, composition or durability. The "embodied" energy used to make and ship a product, the raw materials sources, likely future energy use and level of toxins are all key areas to consider. Ideally, materials should be locally sourced, highly durable and recyclable – as well as appropriate to climate and design preferences.*

Sustainable Procurement

Green Building

Local Materials

**COST** ₹ ₹ ₹ ○ ○

**IMPACT** ★ ★ ★ ★ ★


## BUSINESS CLUSTERING

*When similar businesses or production facilities cluster, supporting services often follow, such as legal, accounting, raw materials and technical services. The groupings of these like-minded businesses and their supporters can lead to opportunities for increased efficiency and the more rapid development of new ideas.*

*(DGNB Reference PRO 1.7)*

International Competitiveness

Phasing

Industrial Symbiosis

**COST**

**IMPACT**


# CENTRE FOR SAFETY SECURITY & ENVIRONMENT

*Located at a central location within the Industrial Park it provides a link to police, security services and immediate environmental protection enforcement. All events related to infringement of the law will be noted, reported and subsequently be assessed and stopped – if needed with the support of the local police and other governmental authorities.*

Industrial Zone Management

Workplace Safety

Ombudsman

**COST** ₹ ₹ ₹ ○ ○

**IMPACT** ★ ★ ★ ○ ○


## DISTRICT CERTIFICATION

*District Certification measures the sustainability of a district in globally recognized terms. Internationally known rating systems such as LEED, BREEAM and DGNB offer district sustainability ratings, with DGNB offering the only certification for industrial districts. This system is appropriate for districts designed for high environmental performance, and can lead to international recognition and marketing opportunities.* *(DGNB Reference PRO 2.2)*

Company Recognition

Green Building

Branding & Identity

**COST** ₹ ₹

**IMPACT** ★ ★ ★


# E-CONSENSUS PLATFORM

*E-Consensus involves using web-based tools to gather people's opinions and make informed decisions. E-consensus platforms are a relatively low-cost tool that allow a broad range of people to participate in decision-making through virtual participation. Industrial Associations could manage the use of these tools in an Industrial District context.* (DGNB Reference PRO 1.6)

Community Relationship

Participatory Planning

Transparency

**COST** ₹ ○ ○ ○ ○

**IMPACT** ★ ★ ○ ○ ○


# INDUSTRIAL SYMBIOSIS

*Industrial symbiosis is a connection between industrial facilities or companies, which share or sell complementary services, utilities or resources. Often industrial symbiosis includes sharing waste or by-products, in which waste from one facility is sold as a resource for the other. This strategy can reduce waste, reduce reliance on new raw materials and open up new revenue streams and savings opportunities.* *(DGNB Reference PRO 1.7)*

Proximity to Partners

Cost Cutting

Circular Economy

**COST** ₹ ₹ ₹ ○ ○

**IMPACT** ★ ★ ★ ★ ○


# INTERNATIONAL PARTNERSHIPS

*International partnerships - whether structured as a collaboration, knowledge share or financial joint venture - are an opportunity for an industrial park to gain international expertise, perspective and investment. Partners may include international organisations, like-minded companies, investors or participants in the supply chain. International organisations may be particularly interested in supporting environmental improvements and upgrades to an "international best practice" standard.*

Industry Investment

Relationship Building

External Communications

**COST**

**IMPACT**


## MAKING USE OF SYNERGY

*Industries should seek out opportunities to collaborate and make use of synergies, whether through the creation of new products, marketing initiatives or joint ventures. These collaborations can yield opportunities impossible for individual companies, while also achieving cost savings or efficiencies through economies of scale.*

Business Clustering

Industrial Symbiosis

International Partnerships

**COST** ₹ ₹

**IMPACT** ★ ★ ★ ★


# MATERIAL EXCHANGE MARKET

*The Material Exchange Market will create a market for back-to-use components. Re-usable components or equipment from one industry can be exchanged for goods of another industry. All components donated are broken down, renovated, altered and prepared for the re-use (eg windows, doors, floorboards, sanitary ware, electrical appliances, stairs, fittings, tiles, etc.). A warehouse and sales hall will provide an affordable market place.*

Industrial Symbiosis

Cost Cutting

By-Product Connections

**COST** ₹ ₹ ○ ○ ○

**IMPACT** ★ ★ ★ ○ ○


# MODULAR CONSTRUCTION ELEMENTS

*Modular elements are factory-produced building units that can be delivered and assembled on site. Pre-engineered and mass-produced, modular materials are typically quite affordable and durable, as they are designed to be transported and craned onto foundations. Using modular can reduce waste, speed up the construction process, decrease on-site disturbance, can be relocated after use and offer cost savings.*

Good Building Design

Smart Material Selection

Cost Cutting

**COST** ₹ ₹

**IMPACT** ★ ★ ★


# POST OCCUPANCY EVALUATION

*Post-Occupancy Evaluation (POE) is the process of studying a building's performance after it has been completed. A POE includes quantitative and qualitative assessments, designed to determine both if the building is functioning technically and if the occupants are satisfied with the building. It also helps to evaluate the benefits of the new/overhauled facilities in terms of increased quality of product, better worker performance, reduced sick rates and higher employee satisfaction levels.*

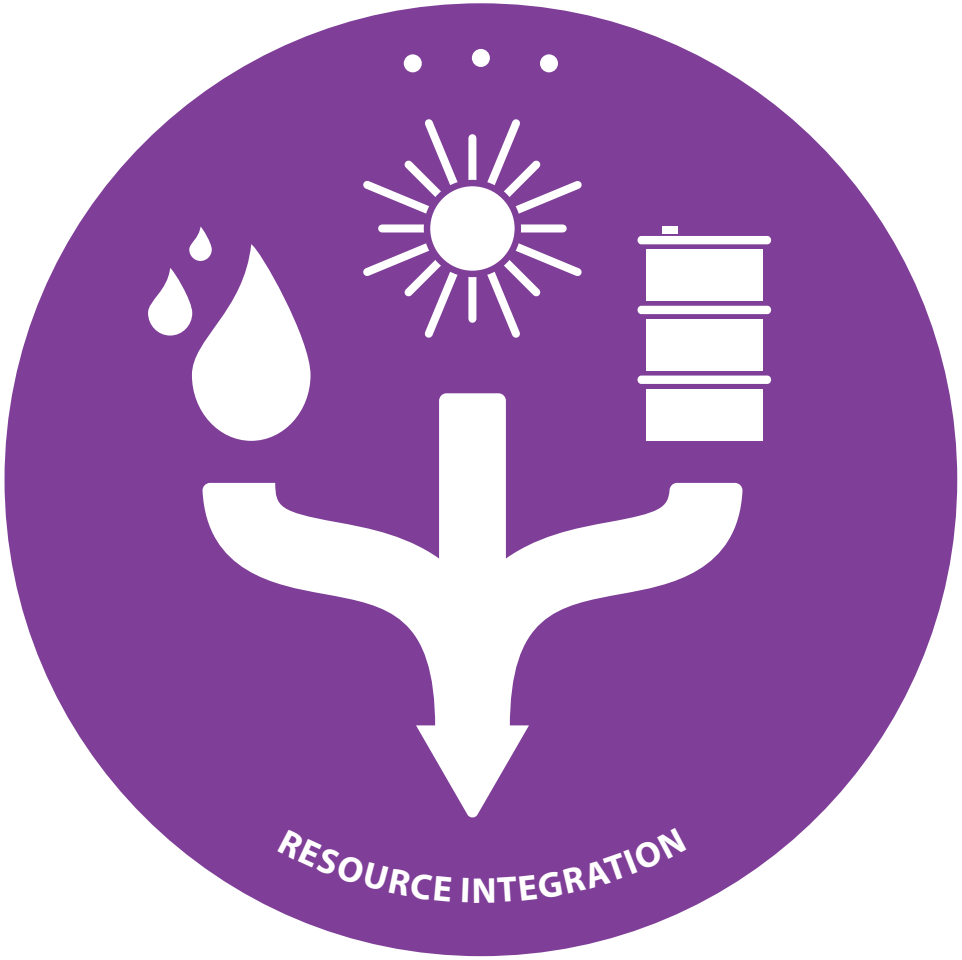
ISO 9001
Quality Management

Efficient Use of Utilities

Regular Maintenance

**COST** ₹ ₹ ○ ○ ○

**IMPACT** ★ ★ ★ ★ ★




# RESOURCE INTEGRATION

*Integrated resource management considers a site's broad energy, water and resource needs and considers them together, rather than in isolation. The solutions achieved typically address multiple concerns, gaining efficiency and often saving costs for the host institutions.* *(DGNB Reference ECO 1.7)*

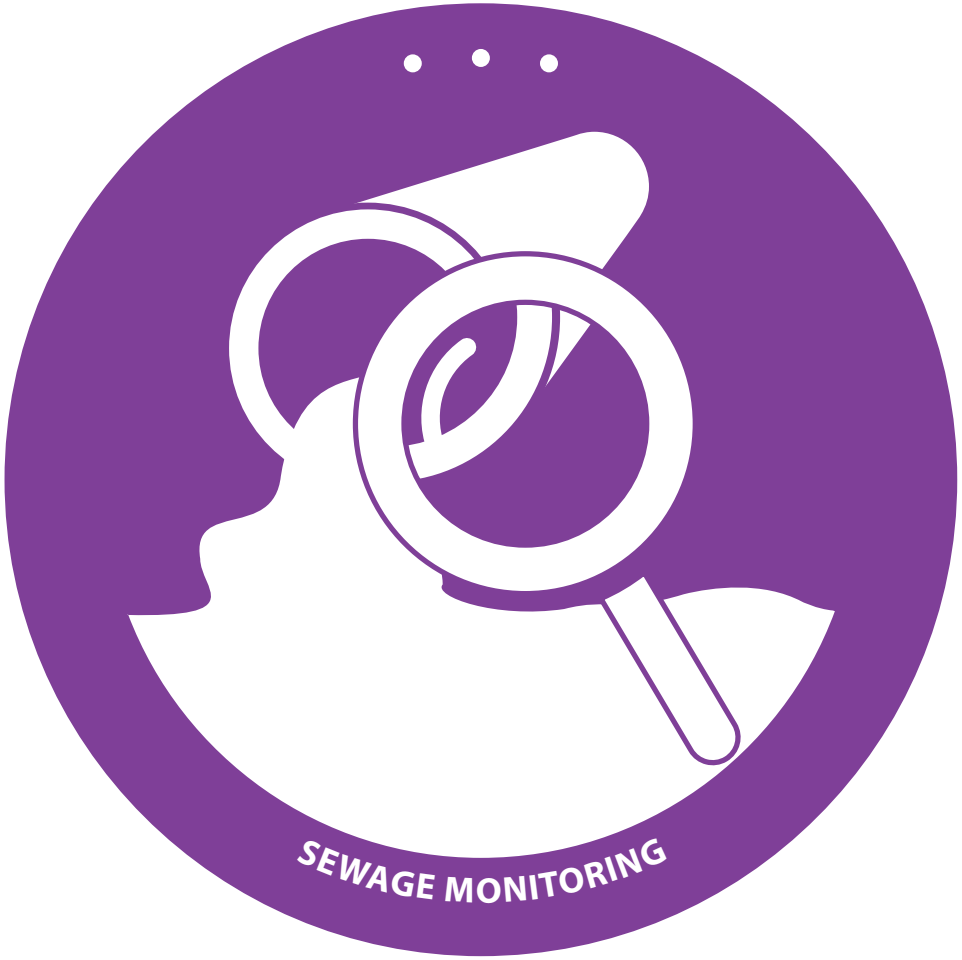
Energy Efficiency

Corporate Data Systems

Optimised Decision Making

**COST** ₹ ₹

**IMPACT** ★ ★ ★ ★




# SEWAGE MONITORING

*Sewage systems must be monitored for functionality and lack of system overflow in order to identify leaking or problematic aspects of the system and plan for upgrades. This is critical for both the health of the industrial district, and the health of surrounding communities.* *(DGNB Reference PRO 1.7)*

Efficient Pipe Layout

Building Inventory

Workplace Safety

**COST** ₹ ₹ ○ ○ ○

**IMPACT** ★ ★ ★ ○ ○


# SOIL MONITORING

*Soil monitoring is a key aspect of a soil management strategy and should consider possible contamination, volume and composition of topsoil and subsoil. Soil should be monitored before, during and after any major construction project, including through an Environmental Impact Assessment.* *(DGNB Reference ENV 1.7)*

Soil Management

Landfill/Rubbish Management

EIA

Environmental Impact Assessment

**COST** ₹ ₹ ○ ○ ○

**IMPACT** ★ ★ ★ ○ ○


## SUSTAINABLE PROCUREMENT

*Sustainable Procurement indicates a business' commitment to use a sustainable supply chain. Alongside considering price and quality, Sustainable Procurement considers other environmental, social and economic factors in the purchase and use of supporting products and services.*

Local Materials

Lifecycle Analysis & Costing

Joint Purchasing

**COST** ₹ ₹ ₹

**IMPACT** ★ ★ ★ ★ ★


## UPCYCLED MATERIALS

*Upcycling is the reuse of discarded materials for a different purpose, often leading to a higher-value outcome. Industrial parks may find that their by-products or wastes can be productively reused - or that local communities can transform particular waste materials into items of interest to the local market.*

Lifecycle Awareness

Recycling

Cost Cutting

**COST** ₹ ○ ○ ○ ○

**IMPACT** ★ ★ ○ ○ ○

## WILDCARD

COST

IMPACT


24/7
24 / 7


24/7
24 / 7
If an industrial district is operating through the day and night (or "24/7" – 24 hours a day, 7 days a week), it should offer its employees services throughout this time. These essential services include sanitation and safety provisions, food access, health facilities and even recreational facilities. (DGNB Reference SOC 4.2)
Active Streets
One Stop Shop
Provision of Recreational Facilitie
COST
IMPACT
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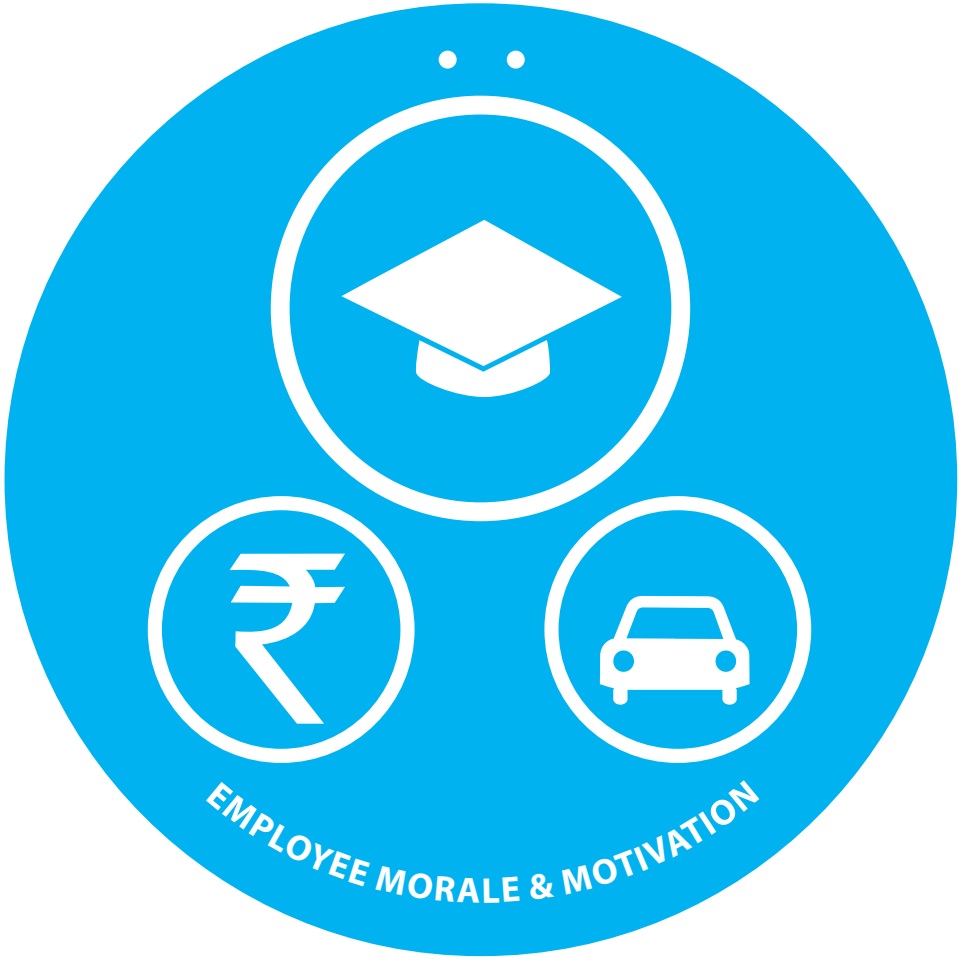



## EMPLOYEE MORALE & MOTIVATION

*Employee morale is the motivation and enthusiasm that employees have for their place of work. Positive morale leads to more productive, committed employees, often willing to take the extra steps needed for high-quality work. Employers can create a high-morale work place through office culture, office environment, good people management and through benefits such as wellness programs and performance bonuses.*

Team Atmosphere

Professional Mobility

Compassion for Employees

**COST**

**IMPACT**


## EDUCATION PROVISION

*Providing employees with educational and training opportunities can improve morale, efficiency and talent retention. Training opportunities should enable employees to learn new skills and thus advance within their career paths, achieving promotions or broader responsibilities within the workplace.*

Schooling Provision

Professional Mobility

Talent Retention

**COST** ₹ ₹

**IMPACT** ★ ★ ★ ★


## RELATIONSHIP BUILDING

*Personal relationships are at the heart of most work environments and define the experiences of many employees. Companies should strive for a culture which values relationship building among employees, between managers and employees, as well as between the company and its suppliers, distributors, clients and customers.*

Team Atmosphere

Community Relationship

Productivity

**COST**

**IMPACT**


# WORKPLACE SAFETY

*Workplace safety is absolutely critical to the design and efficiency of an industrial district. Employee training and spatial design can both contribute to creating a safer work environment, with fewer risks of accidents. Hazardous materials, equipment and machines must all be addressed in the development of safe work procedures and related employee awareness programs.* *(DGNB Reference SOC 1.7)*

Proper Protective Gear

Toxic Waste Reduction

Quality Indoor Environment

**COST** ₹ ₹

**IMPACT** ★ ★ ★ ★ ★


## CONCENTRATED WORK ENVIRONMENT

*A concentrated work environment includes minimal noise, discomfort and external distractions. Providing a concentrated work environment can improve employee productivity and lead to a more efficient overall production process.* *(DGNB Reference SOC 1.8)*

Acoustics

Ventilation

Productivity

**COST**

**IMPACT**


## CAMPUS ATMOSPHERE

*A campus atmosphere implies that a collection of buildings operate as an ensemble, providing employees with all their required spaces and services, along with some green and recreational space. Having an attractive campus atmosphere can improve employee satisfaction and contribute to a company's reputation as a safe, clean and satisfying place to work.* *(DGNB Reference SOC 3.5)*

Open Public Space

24/7 Services

Walkability

**COST**

**IMPACT**


# LEADERSHIP

*Leadership is a critical aspect of every successful business. A company's management team must be able to set realistic yet challenging goals, make decisions in difficult situations and inspire others to work hard. Leadership means not only setting a company's strategic direction but also effectively sharing this vision with others and harnessing the strengths of employees and the broader business network.*

Employee Morale

Productivity

Optimised Decision Making

**COST**

**IMPACT**


## SECURITY

*Facilities security is a key operational aspect of running a successful industrial district. Employees must feel safe, and equipment, infrastructure and technologies must be secure from theft. Security cameras, guards and physical measures such as gates or fencing can all contribute to creating a secure environment. The design of the public realm, including sufficient outdoor lighting, can also improve security and perception of security.* *(DGNB Reference SOC 1.7)*

Sufficient Outdoor Lighting

Data Security


24/7 Services

**COST** ₹ ₹ ₹

**IMPACT** ★ ★ ★ ★ ★


## TEAM ATMOSPHERE

*Building a team-oriented culture can lead to more employee motivation, and contribute to the retention of talented employees. In general, team atmospheres are open, transparent and positive, with opportunities for all to contribute and work together.*

Productivity

Employee Morale

Respect for Diversity

**COST**

**IMPACT**


## PROPER PROTECTIVE GEAR

*Workplace safety is crucial to any sustainable work environment, and a key aspect of this is employee protective gear, particularly for work with hazardous materials. This gear should be durable, dependable and available for all who need it – and ideally personalised. Equipment requirements will vary for each industrial operation, but may include chemical-resistant clothing, as well as protective gloves, headgear, glasses and footwear.*

Workplace Safety

Regular Maintenance

Compassion for Employees

**COST** ₹ ₹ ₹

**IMPACT** ★ ★ ★ ★ ★


## WOMEN'S EMPOWERMENT

*Gender equity is a major issue in India at the moment and a key aspect of the UNDP's national Millennium Development Goals. Currently, women have far fewer educational opportunities, lower rates of literacy and lower wages than men. Indian industrial districts can contribute to improving this situation by providing women with fair wages and opportunities for advancement and skills development.*

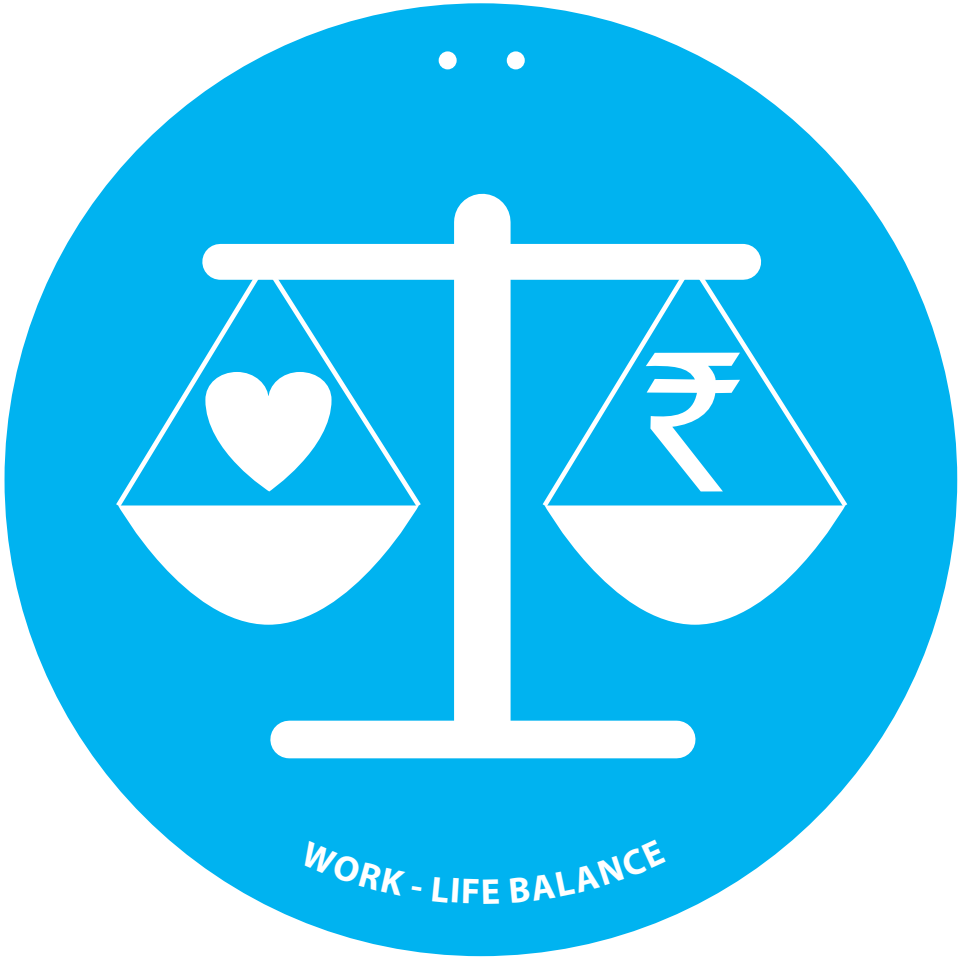
Respect for Diversity

Professional Mobility

Children's Nursery Provision

**COST** ₹ ○ ○ ○ ○

**IMPACT** ★ ★ ★ ★ ★




## WORK - LIFE BALANCE

*Work-Life Balance is a concept that differentiates between professional pursuits and personal or spiritual development. To achieve a Work-Life Balance, employees require reasonable working hours, predictable work expectations and access to the social infrastructure needed for personal and family development.*

Talent Retention

Provision of Recreational Facilitie

Compassion for Employees

**COST** ₹ ₹

**IMPACT** ★ ★ ★


## SUFFICIENT OUTDOOR LIGHTING

*Outdoor lighting is essential to ensure that employees feel safe on site in the evenings, or when entering or existing industrial facilities. Lighting planning should be a clear part of any public realm or site design strategy, with preference given to energy efficient and long-lasting lighting, such as LED.* *(DGNB Reference SOC 1.9)*

Security

Open Public Space

Campus Atmosphere

**COST** ₹ ₹

**IMPACT**


## OPEN PUBLIC SPACE

*The public realm includes the outdoor public spaces, right of ways and spaces between buildings which are accessible to all. A well-designed public realm offers a safe pedestrian experience, as well as pleasant places to meet, shop and recreate. The public realm design of an industrial district can both improve the environment for workers and contribute to the neighbourhood or city where the district is located.* *(DGNB Reference SOC 1.6)*

Campus Atmosphere

Urban Framework

Green Networks

**COST** ₹ ₹ ₹ ○ ○

**IMPACT** ★ ★ ★ ★ ★


## ENTERTAINMENT

*Industrial Districts can include functions beyond office and industrial space, such as worker housing, retail and open civic spaces. For multi-use industrial districts, some entertainment and cultural uses will improve employee quality of life, whether these uses include recreational sports facilities, cinemas or multi-use community spaces.*

Employee Morale

Work-Life-Balance

Well-Being

**COST** ₹ ₹ ₹

**IMPACT** ★


# ACTIVITY VOUCHERS

*Providing employees with access to social infrastructure, as well as some recreational opportunities and the time needed to take advantage of these, can greatly contribute to employee health, happiness and retention. Proactive employers could also consider providing "activity vouchers" – time-sensitive vouchers that will encourage employees and potentially their families to sign up for recreational or health-related activities outside of the workplace.*

*(DGNB Reference SOC 4.2)*

Employee Morale

Work-Life-Balance

Well-Being

**COST** ₹ ○ ○ ○ ○

**IMPACT** ★ ○ ○ ○ ○


# INFORMAL HOUSING UPGRADE

*Informal housing is common in India, indicating broader problems with poverty, health and standard of living. Industrial districts often see adjacent informal housing development, contributing to poor health standards on site, for both employees and residents. Industrial districts should strive to provide a better standard for those living in these quarters. Industrial facilities also must comply with all emissions and chemical regulations, ensuring outputs do not harm those living nearby.*

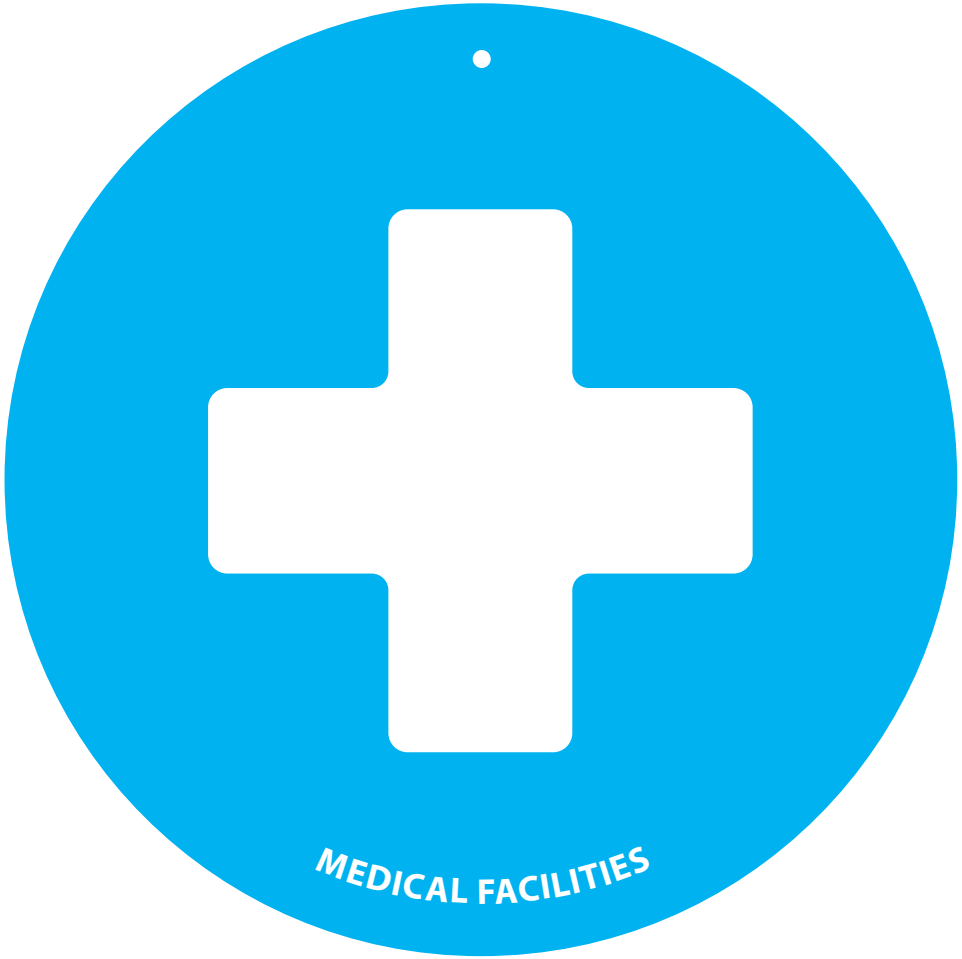
Social Infrastructure

Public Toilet Provision

Community Relationship

**COST** ₹ ₹

**IMPACT** ★ ★ ★ ★




# MEDICAL FACILITIES

*Employees should have convenient access to medical facilities from an industrial district, including major facilities for emergency care and local facilities for regular, preventive care. Large industrial districts may consider having a medical facility on site, and industrial districts of all sizes should follow safety precautions and have first aid materials available for immediate needs.*

*(DGNB Reference SOC 4.2)*


24/7 Services

Talent Attraction

Health Cover

**COST** ₹ ₹ ₹ ₹

**IMPACT** ★ ★ ★ ★ ★


# SOCIAL INFRASTRUCTURE

*Social infrastructure comprises facilities required by employees for their health and well-being, including medical facilities, schools, sports facilities and transportation access. Ideally, industrial districts should be within reasonable distance of these sorts of facilities, with buildings and programs accessible to employees and the surrounding community alike.* *(DGNB Reference SOC 4.2)*

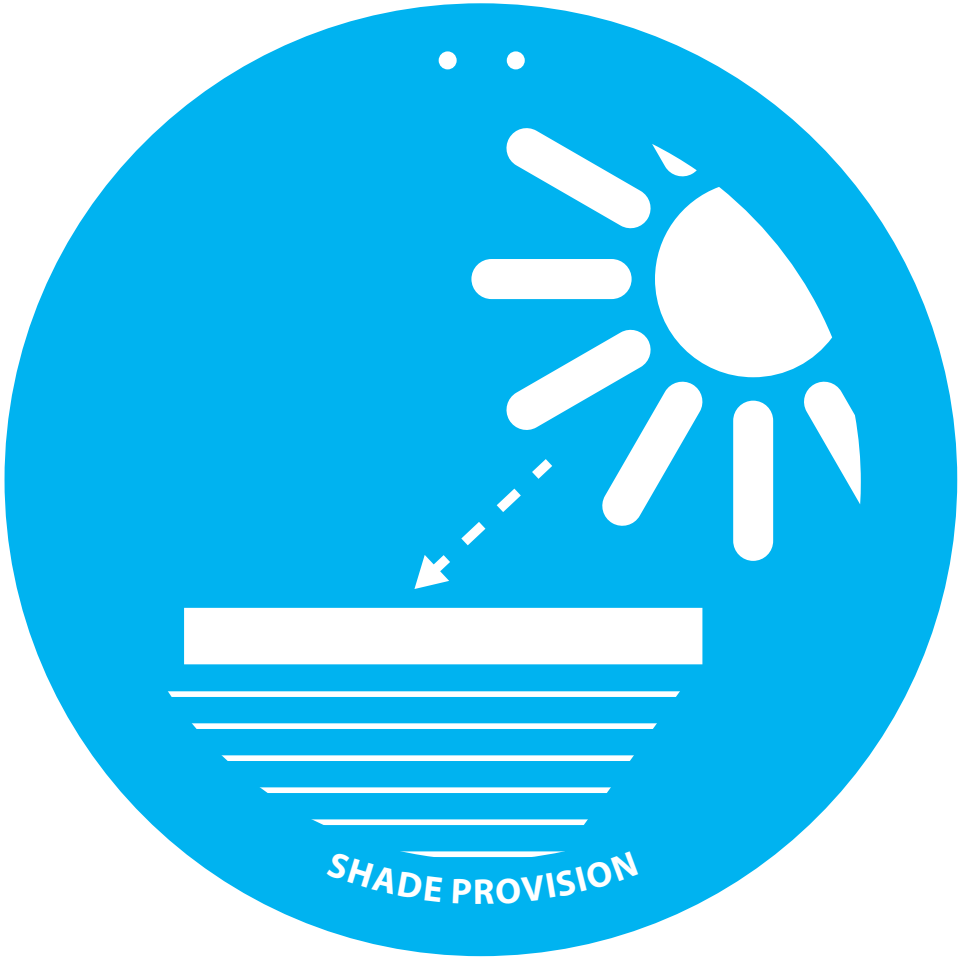
24/7
Services

Medical Facilities

Well-being

**COST** ₹ ₹ ₹

**IMPACT** ★ ★ ★ ★ ★




## SHADE PROVISION

*Providing shade on site can make the outdoor environment more pleasant for employees and others spending time outside. Shade can be achieved through natural tree canopy, or through shelters, canopies or awnings. Including sufficient shade on site can enable employees who are on break to benefit from fresh air and sun away from their more constrained work environments and limit the risk of heat strokes.* *(DGNB Reference SOC 1.6)*

Open Public Space

External Water Features Cooling

Active Streets

**COST** ₹ ₹ ○ ○ ○

**IMPACT** ★ ★ ★ ○ ○


## PROVISION OF RECREATIONAL ACTIVITIES

*Recreational facilities, such as playing fields or a gym, can offer employees the chance to exercise, relax and get to know colleagues outside of the work environment, including through sports. This sort of wellness initiative can benefit employee health and morale and subsequently boost productivity.* *(DGNB Reference SOC 4.2)*

Employee Morale

Well-being

Team Atmosphere

**COST** ₹ ₹ ₹

**IMPACT** ★ ★


## WELL - BEING

*Healthy individuals are generally more satisfied and productive employees. Investment in workplace wellness programs thus can improve efficiency, as well as morale and office absenteeism rates. These programs might include educational programs, health programs or holistic health activities such as yoga.*

*(DGNB Reference SOC 1.8)*

Social Infrastructure

Provision of Recreational Facilitie

Education Provision

**COST** ₹ ○ ○ ○ ○

**IMPACT** ★ ★ ★ ○ ○


# WALKABILITY

*Walkability express how safe and friendly an area is for walking. Key factors in walkability include pedestrian safety, urban form, existence of footpaths and attractiveness of nearby destinations. Industrial districts should be designed to positively contribute to the walkability of their surrounding pedestrian environments, with provisions such as foot paths and safe intersect.* *(DGNB Reference SOC 1.1)*

Sufficient Outdoor Lighting

Open Public Space

Multi Model Transportation

**COST** ₹ ₹

**IMPACT** ★ ★ ★


# ACOUSTICS

*Acoustics, or the management of sound within a building, is critical to employee well-being and functionality of an industrial space. Noise problems not only can cause hearing impairment or loss among employees, but also contribute to stress or inefficiency. Building design must ensure adequate control of mechanical equipment noise such as mechanical ventilation, generators and factory machinery.* *(DGNB Reference SOC 1.8)*

Good Building Design

Quality Indoor Environment

Productivity

**COST**

**IMPACT**


# CHILDRENS' NURSERY PROVISION

*Providing a children's nursery on site supports the family life of employees, and facilitates mothers' re-entry into the workforce. Providing social infrastructure such as nurseries can make an industrial district a more desirable place to work, and thus can contribute to employee retention, satisfaction and productivity.*

*(DGNB Reference SOC 4.2)*

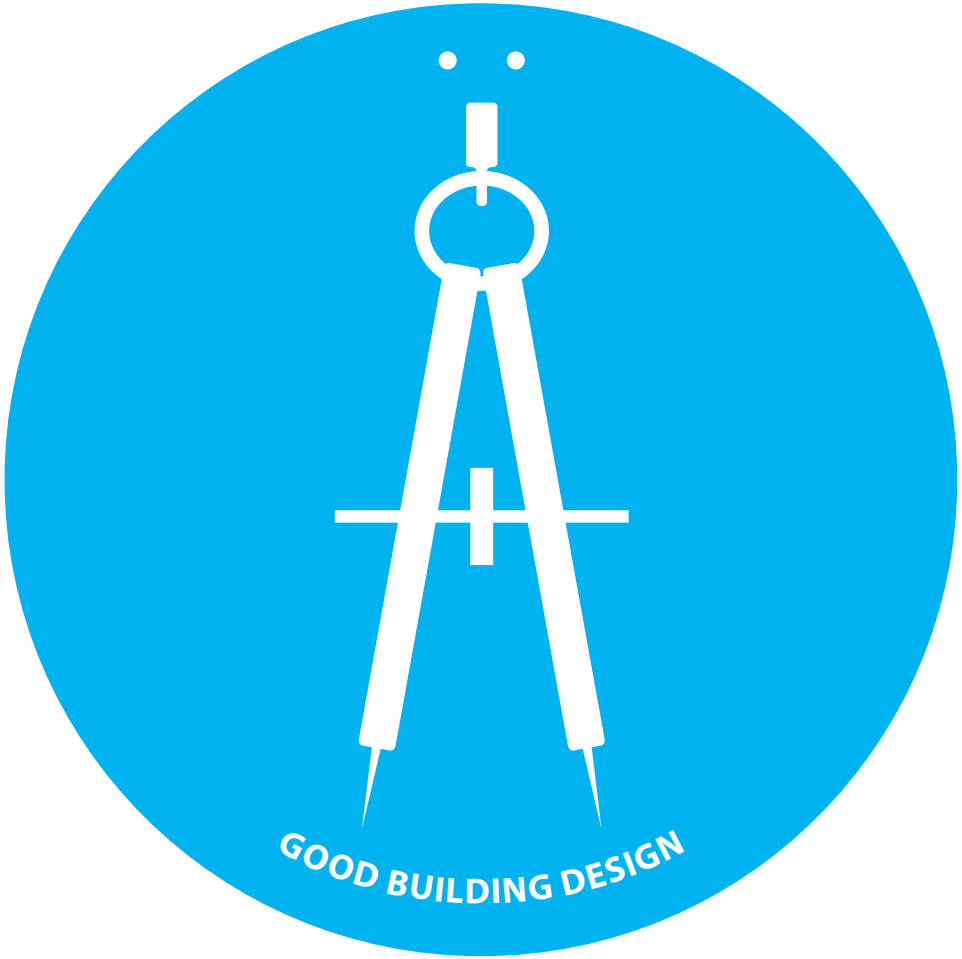
Schooling provision

Social Infrastructure

Women's Empowerment

**COST** ₹ ₹

**IMPACT** ★ ★ ★




## GOOD BUILDING DESIGN

*Good building design can greatly contribute to employee experience and is not necessarily more expensive than the alternative. Building design should consider building orientation, ventilation and spatial efficiency, to create a healthy, well-lit work environment. Buildings should also be designed for low energy use, straightforward maintenance, maximum durability and flexibility for future change of use.* *(DGNB Reference SOC 3.5)*

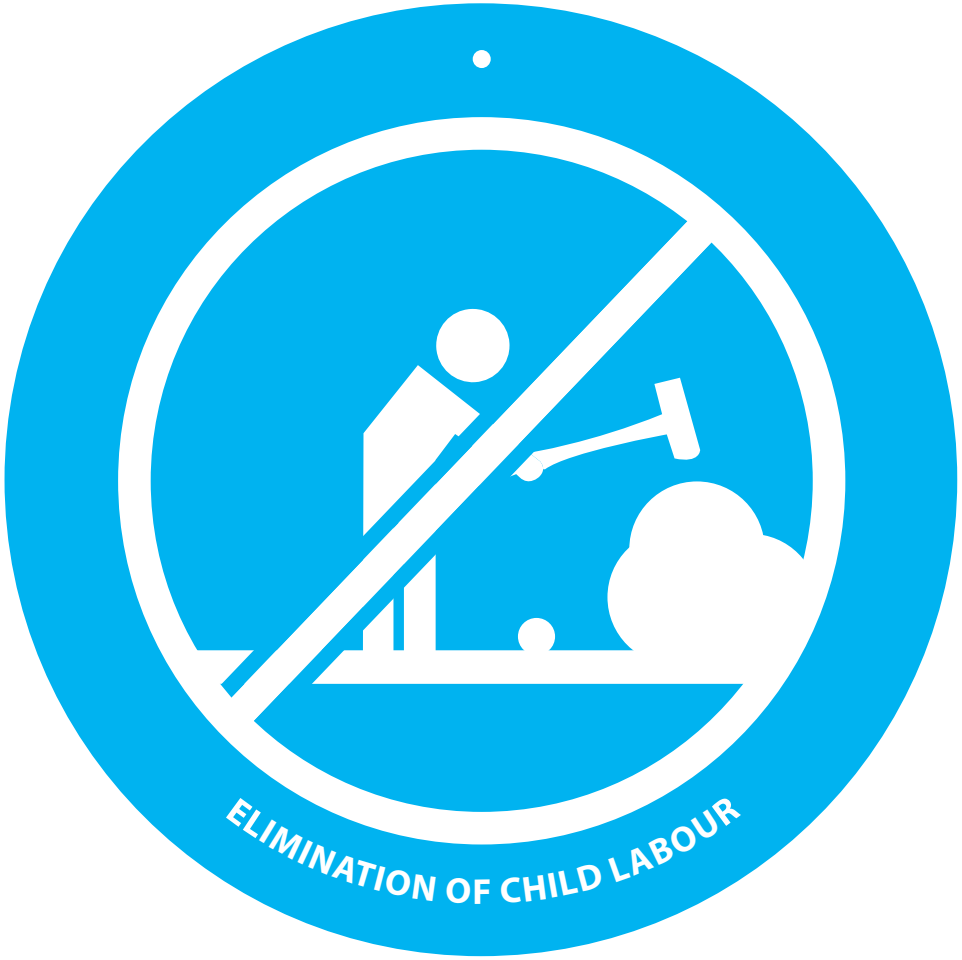
Building Orientation

Ventilation

Smart Materials Selection

**COST** ₹ ₹ ₹

**IMPACT** ★ ★ ★ ★




# ELIMINATION OF CHILD LABOUR

*Child Labour is the practice of employing children, which is harmful to their physical and emotional development and deprives them of educational opportunities. The Indian Constitution and numerous national and state Acts prohibit child labour, with particular reference to work in factories, mines and hazardous industries. Industrial districts must not employ children and should participate in broader efforts to combat the practice.*

Legislation

Schooling Provision

Industrial Zone Management

**COST** ₹ ○ ○ ○ ○

**IMPACT** ★ ★ ★ ★ ★


# ACTIVE STREETS

*Active streets include a range of types of activities and users, such as housing, retail and public spaces. Spaces like these are stimulating and convenient destinations for residents to access their daily needs, and also tend to be safe due to the level of activity and surveillance. Locating an industrial park in an area with active streets may improve employee satisfaction and perception of safety.*

*(DGNB Reference SOC 3.5)*

Safe Food Stalls

Walkability

Urban Framework

**COST** ₹ ₹ ○ ○ ○

**IMPACT** ★ ★ ○ ○ ○


# ONE STOP SHOP RETAIL ACCESS

*Industrial districts within an urban context offer employees access to other daily services they might need, such as food stalls, pharmacies or retail – ideally combined in one location. For more isolated industrial districts, employees will appreciate access to basic retail on-site, as well as transport connections to higher-density retail or services.* *(DGNB Reference SOC 4.2)*

24/7 Services

Walkability

Urban Framework

**COST**

**IMPACT**


## CONNECTIVITY

*Path connectivity on industrial sites is of elementary importance for connecting people and open public spaces alike. A coherent path and open space system fosters accessibility and quality of the industrial sites and often can save time. Clear and distinguishable path design should be implemented to improve the overall connectivity and safety.* *(DGNB Reference SOC 1.7)*

Green Networks

Walkability

Open Public Space

**COST** ₹ ○ ○ ○ ○

**IMPACT** ★ ★ ★ ○ ○


# HANDICAP ACCESS

*Handicap accessibility ensures ease of facilities access for people with the full range of physical abilities. Accessibility may ensure that wheelchair users can reach all parts of a facility, or that systems are in place to help blind or deaf employees. Accessibility also relates to universal design, which ensures that products and spaces are accessible and easy to navigate by all, whether impeded by a disability or not.* (DGNB Reference SOC 2.1)

Inclusion

Compassion for Employees

Access to Mass Transport

**COST** ₹ ₹

**IMPACT** ★ ★ ★ ★


# SUPPORT / HELPDESK

*Help desk support should be available to both internal employees and to external customers or clients. A help desk can respond to technical queries which are likely to have a quick-turn-around time, increasing efficiency and decreasing delays or dissatisfaction.*

*(DGNB Reference SOC 4.2)*

Remote Access

Corporate Data Systems

Customer for Life

**COST**

**IMPACT**


# KNOWLEDGE / GUIDEBOOKS

*An Industrial District should include a library to be accessed by management and all employees, including books on best practice in the industry and guidebooks documenting how work is done within the Industrial District. These resources should be incorporated into employees' continuing education opportunities.*

*(DGNB Reference SOC 3.5)*

Education Provision

Schooling Provision

Value Networks

**COST**

**IMPACT**


## COMMUNITY RELATIONSHIPS

*Regular communication and transparency with the local community is a critical aspect of the sustainable management of an industrial district. Community members should be informed of plans for facilities development, and offered opportunities to benefit from the growth.*

Transparency

Participatory Planning

Urban Framework

**COST** ₹ ○ ○ ○ ○

**IMPACT** ★ ★ ★ ★ ○


## SAFE FOOD STALLS

*The Indian Government has passed recent laws about the hygiene of food stalls, including licensing and monitoring to improve safety standards. Industrial Districts adjacent to food stall clusters should support the vendors in adhering to hygiene standards, perhaps by offering access to public toilets, hand-washing facilities and other hygiene facilities.* *(DGNB Reference SOC 4.2)*

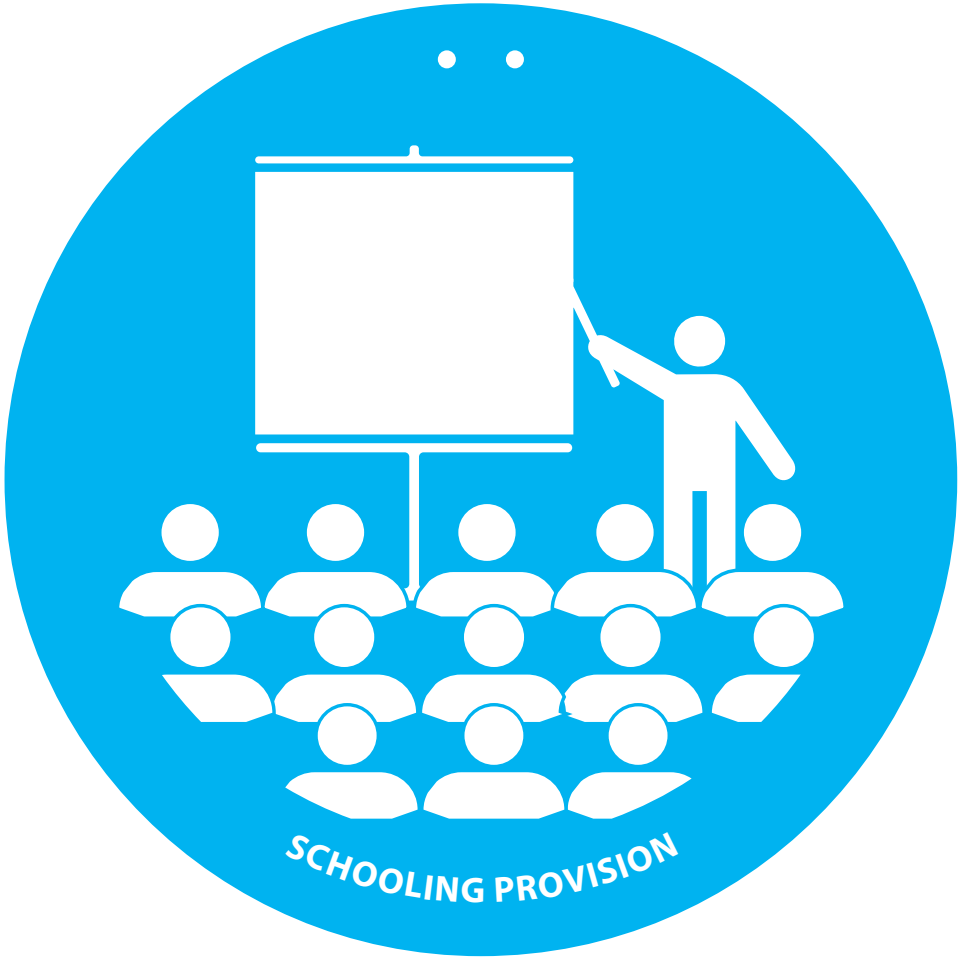
Social Infrastructure

Proper Sanitation

Active Streets

**COST** ₹ ○ ○ ○ ○

**IMPACT** ★ ★ ○ ○ ○




## SCHOOLING PROVISION

*India's 2009 Right to Education Act states that schooling is free and required of students from ages 6 through 14. All children have the right to full-time education provided by the State, and cannot be engaged in child labour. Industrial districts should support the needs of employees to educate their children, and must follow all labour laws regarding age of employees.* *(DGNB Reference SOC 4.2)*

Elimination of Child Labour

Well-being

Social Infrastructure

**COST** ₹ ○ ○ ○ ○

**IMPACT** ★ ★ ★ ★ ★


# PUBLIC TOILET PROVISION

*Public toilet access is a problem in India nationally, with particular problems in rural areas, where a high percentage of people lack facilities. Industrial districts should offer public toilets for neighbours in the vicinity, both for public interest purposes and for environmental and local sanitation purposes. The current lack of toilet and latrine facilities in many villages can also be a public safety issue for women and children.*

Social Infrastructure

Community Relationship

Proper Sanitation

**COST** ₹ ₹

**IMPACT** ★ ★ ★ ★


## INCLUSION

*Inclusive work environments are welcoming to all participants, accepting ideas from all and encouraging diversity of thought and approach. Inclusion is a key aspect of developing a tolerant, safe and balanced work environment, in which all feel welcome to contribute.* *(DGNB Reference SOC 3.2)*

Respect for Diversity

Team Atmosphere

Compassion for Employees

**COST** ₹ ○ ○ ○ ○

**IMPACT** ★ ★ ★ ★ ○


# GREEN NETWORKS

*Connecting green space on-site at an industrial district with adjacent green space is beneficial for local ecosystems, as well as employees and neighbours. Green linkages should be a key part of any site design exercise, with green corridors created for recreation, biodiversity, stormwater management and local species migration.*

*(DGNB Reference SOC 3.4)*

Open Public Space

Tree Selection and Preservation

Management of Stormwater

**COST** ₹ ₹

**IMPACT** ★ ★ ★


## COMPASSION FOR EMPLOYEES

*The success of any business is built on the performance of its employees, and accordingly, investing in employee well-being can lead to an efficient and productive work environment. Industrial districts should show compassion for employees by providing reasonable schedules, fair pay and access to social infrastructure and other resources.*

Employee Morale

Branding & Identity

Inclusion

**COST** ₹ ○ ○ ○ ○

**IMPACT** ★ ★ ★ ★ ○


## BRANDING & IDENTITY

*The branding and identity of a company is a key aspect of its success, both in terms of the positioning of its product and the mindset and values of employees. A company with a strong brand is memorable to consumers, while a strong company identity can motivate employees and draw talent to the company.*

*(DGNB Reference SOC 1.6)*

International Competiveness

Talent Retention

Customer for Life

**COST** ₹ ₹

**IMPACT** ★ ★ ★


## RESPECT FOR DIVERSITY

*India is one of the most diverse countries in the world, particularly in terms of religion, language, regional cultures and ethnic groups. Workplaces like industrial districts must be accepting and respectful of the diversity of their employees, creating tolerant workplaces with anti-discrimination policies and provisions for all.*

*(DGNB Reference SOC 2.2)*

Team Atmosphere

Compassion for Employees

Inclusion

**COST** ₹ ○ ○ ○ ○

**IMPACT** ★ ★ ★ ★ ○


## GLOBAL KNOWLEDGE SHARE

*Successful businesses take the opportunity to learn from the best in the field, both in their market and internationally. Companies should strive to learn from international best practice, share this global knowledge with their employees and let the world know about their own achievements.*

Collaboration among Industries

International Patnerships

Big Data

**COST** ₹ ₹ ○ ○ ○

**IMPACT** ★ ★ ○ ○ ○

# WILDCARD

COST

IMPACT


# FIRE SERVICES

*Fire service is an elementary service that helps to prevent higher risk for people and the enviroment. A factory or Industrial park fire service unit should be able to reach any location within the boundaries of the industrial park in at least five minutes. Fire service is by no means a replacemnt for a proper fire prevention, which can provide high protection with very simple measures.*

*(DGNB Reference SOC 1.7)*

Social Infrastructure

Workplace Safety

Industrial Risk Management

**COST** ₹ ₹ ○ ○ ○

**IMPACT** ★ ★ ★ ★ ★


# TRAFFIC RISK REDUCTION

*Traffic risk on site is a danger which should not be underestimated. High traffic injury rates may have a large impact on economic and social losses.. These losses arise from the cost of medical treatment as well as reduced or lost productivity for those killed or disabled through traffic accidents. By implementing simple measures such as clear and distinct road markings and the design of a safe pedestrian environment, traffic risk may me reduced considerably.*

*(DGNB Reference SOC 1.7)*

Open Public Space

Walkability

Active Streets

**COST** ₹ ○ ○ ○ ○

**IMPACT** ★ ★ ★ ○ ○


# WELL - LIT WORKSPACES

*A well designed high quality working enviroment is a pre-condition for the well being and productivity of employees. Daylight provision and visual connections to the outside environment increase visual comfort and the overall quality of the working enviroment. Shading elements and blinds my be installed additionally to help the user regulate light and comfort levels individually.* *(DGNB Reference SOC 1.7)*

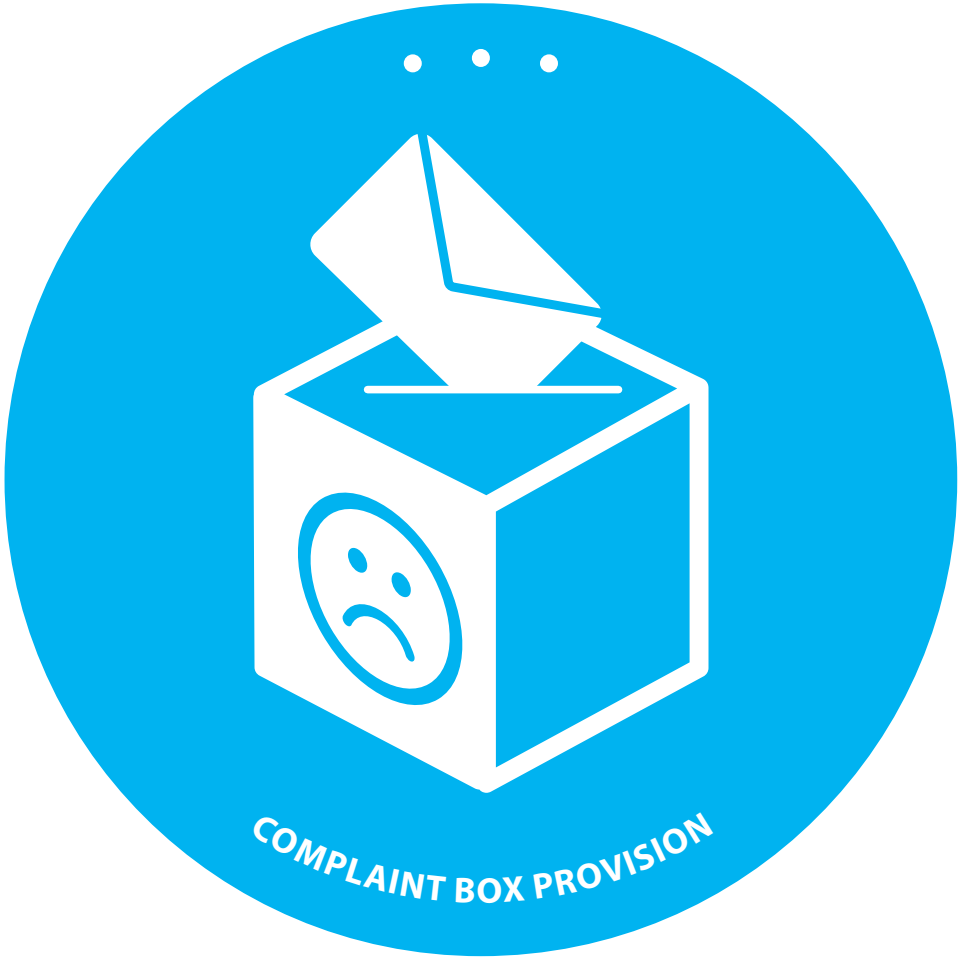
Good Building Design

Quality Indoor Working Enviromnet

Well Being

**COST** ₹ ○ ○ ○ ○

**IMPACT** ★ ★ ★ ○ ○




## COMPLAINT BOX PROVISION

*Installing a complaint box is a very simple method to assist employees in communicating problems and concerns anonymously. Empowering Employees to voice their opinions increases their feeling of value and recognition within their organisation. This not only increases the employee retention rate but also has a positive effect on the productivity and well-being of employees.* *(DGNB Reference SOC 1.8)*

Compassion for Employees

Talent Retention

Ombudsman

**COST** ₹ ○ ○ ○ ○

**IMPACT** ★ ★ ○ ○ ○


# NOISE PROTECTION

*Excessive noise is a health risk factor which may cause considerable long-term damage to employees. Prolonged exposure to excessive noise levels may lead to headaches, sleep disorder, agression and a general decrease in productivity. Common sources of noise are traffic, aircraft noise and noise from industrial machines and processes. Noise emmision may be reduced through good building design and additional noise control products such as acoustic baffles.*
*(DGNB Reference SOC 1.9)*

Acoustics

Good Buidling Design

Well Being

**COST** ₹ ○ ○ ○ ○

**IMPACT** ★ ★ ★ ○ ○


# RUBBISH BIN PROVISION

*Rubbish bin provision is a simple but important aspect of any waste management strategy. Employees need access to rubbish bins to dispose of non-recyclables as well as sorted, recycled materials. Industrial Districts can also assist their surrounding communities and overall public realm by ensuring that immediately surrounding areas are well-served by rubbish bins and collection services.*

Landfill/Rubbish Management

Open Public Space

Campus Atmosphere

**COST** ₹ ○ ○ ○ ○

**IMPACT** ★ ★ ○ ○ ○


# LED FOR EXTERIOR SPACES

*LED (Light-Emitting Diode) is a lighting system which uses a semiconductor to emit light when activated by an electric current. LEDs are more environmentally friendly and long-lasting than incandescent bulbs, and do not require toxic materials or mercury. The technology is also cooler, has a lower usage cost and can be incorporated into communications technology. However, with rare earth content, efforts should be taken to recycle once dysfunctional.*

*(DGNB Reference SOC 1.9)*

Energy Efficiency

Sufficient Outdoor Lighting

Open Public Space

**COST** ₹ ₹ ₹

**IMPACT** ★ ★ ★


## RESOURCE EFFICIENT LANDSCAPE

*Designing public spaces and outdoor areas with native plants not only contributes to local biodiversity but also saves water and requires less maintenance. These efficient, cost-saving and resource-saving landscapes contribute to the public realm and atmosphere of an industrial district, providing employees spaces to enjoy fresh air and the local environment.* *(DGNB Reference SOC 4.1)*

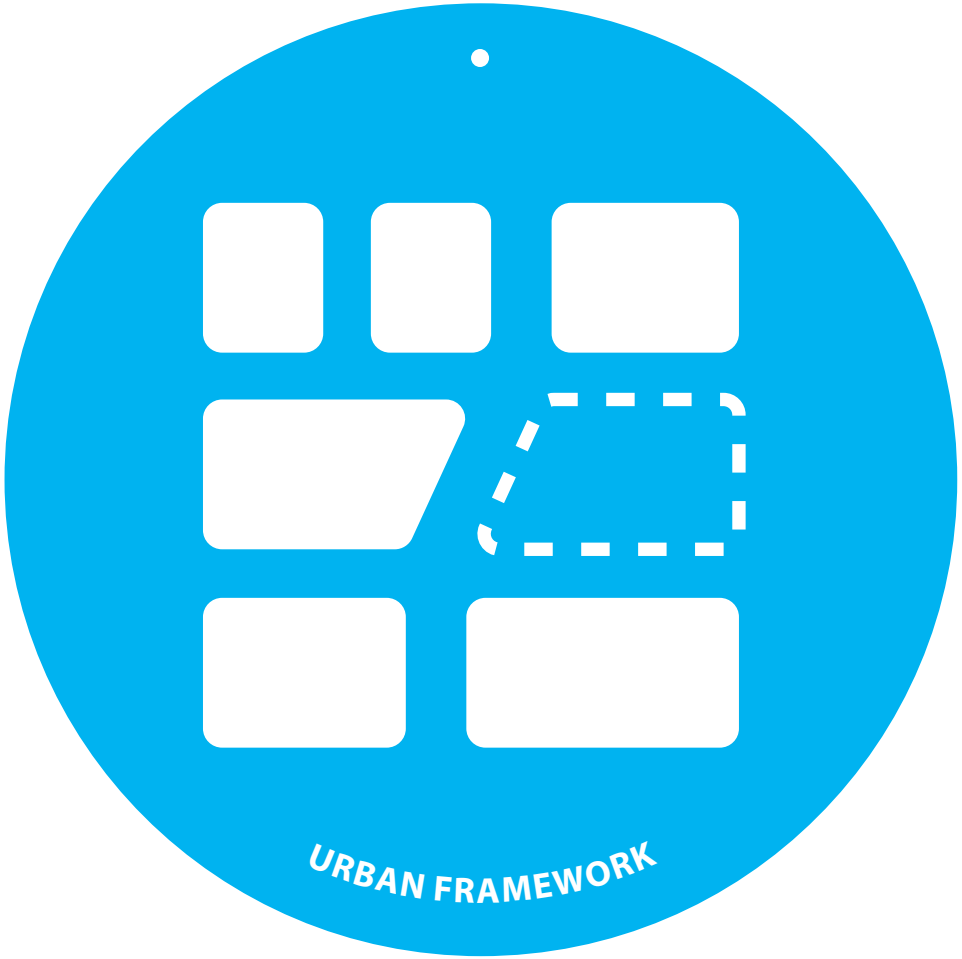
External Water Features Cooling

Open Public Space

Adaptation Strategy

**COST** ₹ ₹

**IMPACT** ★ ★ ★




## URBAN FRAMEWORK

*Industrial districts within an urban area should be designed with the urban context in mind. For example, the overall site should be designed with good connectivity to public transport and other social and commercial infrastructure. The site should also be respectful of surrounding urban facilities with regards to public realm design, waste management, noise and activity levels.*

*(DGNB Reference SOC 3.4)*

Common Utilities

Open Public Space

Access to Mass Transport

**COST** ₹ ○ ○ ○ ○

**IMPACT** ★ ★ ○ ○ ○


# ART & DESIGN

*Art & Design can make a decisive contribution to the quality and significance of buildings and industrial districts alike. Recommendations may be expressed by the Industrial Park Management paired with a fixed percentage of the construction costs to be spent for art. Local artists or design colleges in close proximity can help to maintain a high level of creativity while keeping costs low.* *(DGNB Reference SOC 3.5)*

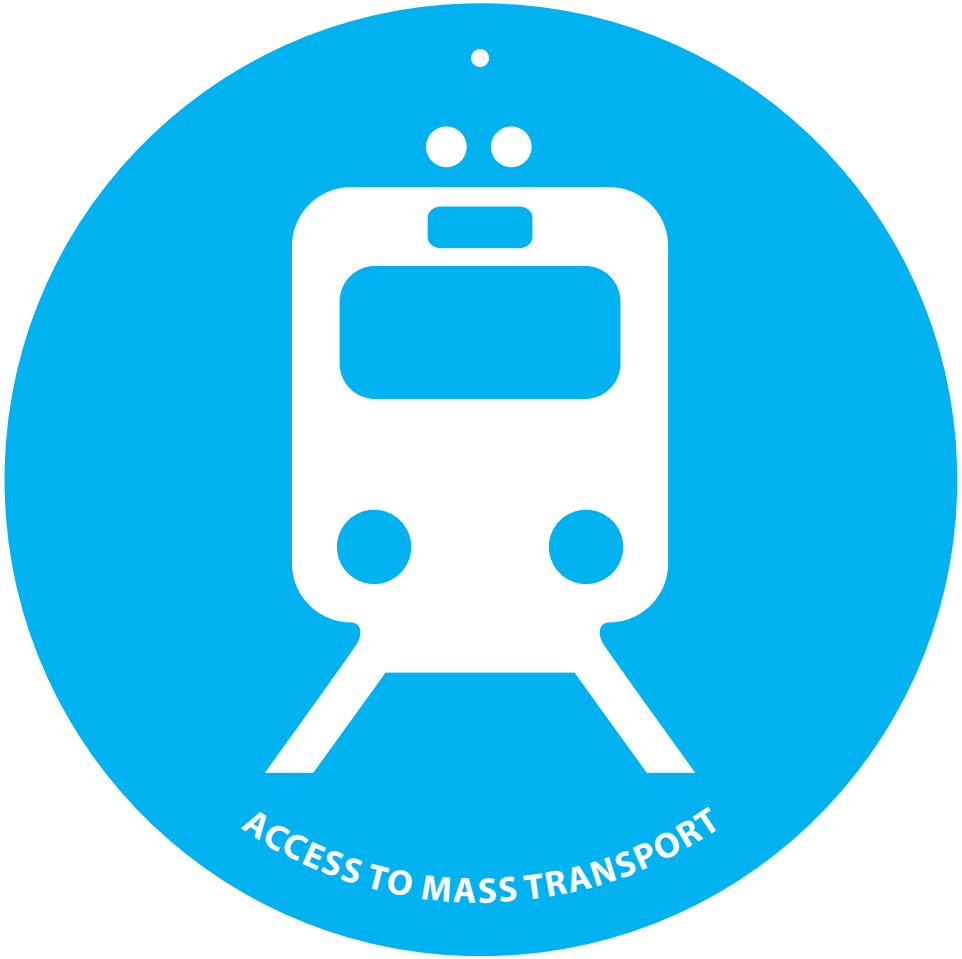
Entertainment

Branding and Indentity

Open Public Space

**COST** ₹ ₹

**IMPACT** ★ ★




## ACCESS TO MASS TRANSPORT

*Location in close proximity to mass transport eases access to the industrial district for employees, external partners, clients and other visitors. Whether a bus, tram or rail connection, all of these options offer visitors a more environmentally sustainable and efficient means of reaching the district, easing traffic congestion in the process.* *(DGNB Reference SOC 4.2*

Minimisation of Greenhouse Gases

Congestion Reduction

Multimodal Transport

**COST** ₹ ₹

**IMPACT** ★ ★ ★ ★


# AIR TRAVEL CONNECTIVITY

*Connectivity is key to the success of an industrial district, including air, road and rail connectivity. Proximity to an airport can be particularly useful for both logistical access and for traveling employees, collaborators and clients. Ideally, a district is located in close proximity to an airport, with multimodal airport access, such as rail or bus options.*

Multi-modal Transport

Location

International Competiveness

**COST** ₹ ₹

**IMPACT** ★ ★ ★ ★


## BUILDING ORIENTATION

*Building design should always consider orientation, ensuring that building layout is compatible with the pathway of the sun and wind direction. When building orientation is optimised, buildings can take advantage of passive solar technologies, minimise use of artificial lighting and create spaces with better day light, ventilation and natural cooling.*

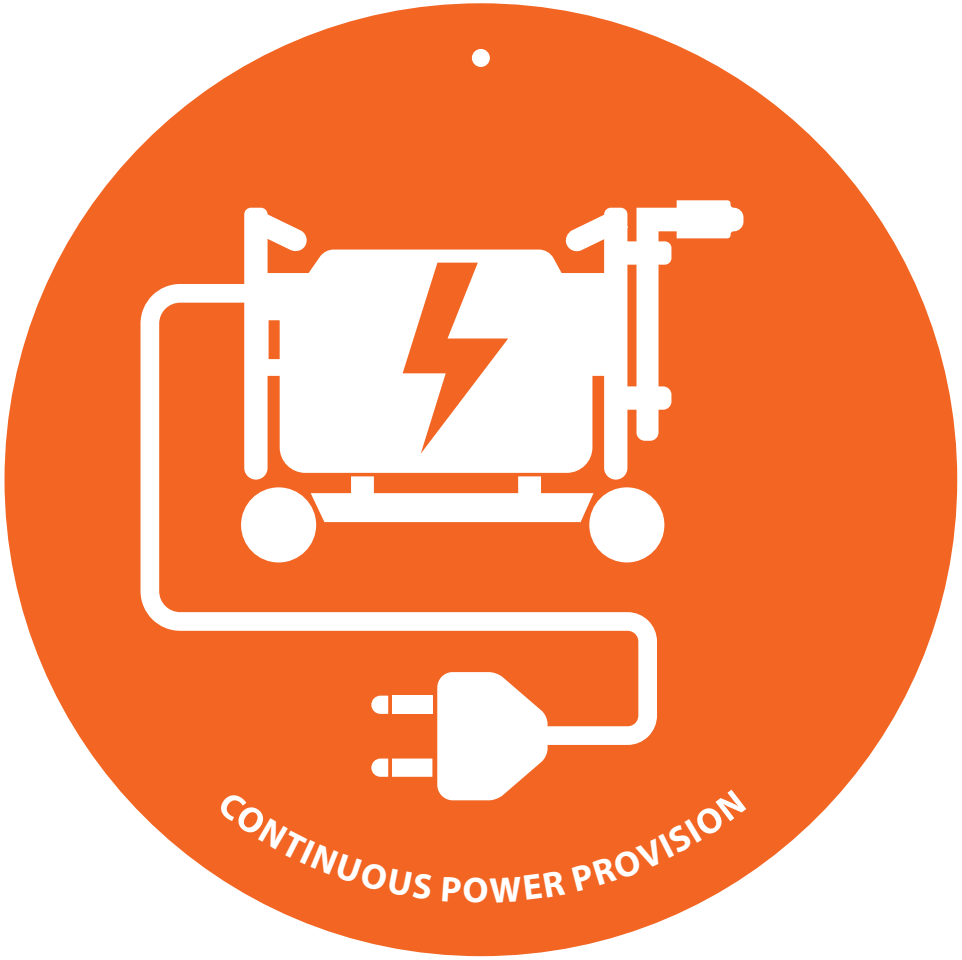
Solar (PV)

Energy Efficiency

Good Building Design

**COST** ₹ ○ ○ ○ ○

**IMPACT** ★ ★ ★ ○ ○




## CONTINUOUS POWER PROVISION

*Many companies are unprepared for business disruptions caused by power blackouts. They are often unaware of the true costs and impact that these can have on their operations and important machinery. While organizations may feel that the likelihood of power outages is beyond their control, they should be prepared for these and be able to bridge the time of power loss by means of backup generators and batteries.* *(DGNB Reference TEC 2.1)*

Clean Energy Strategy

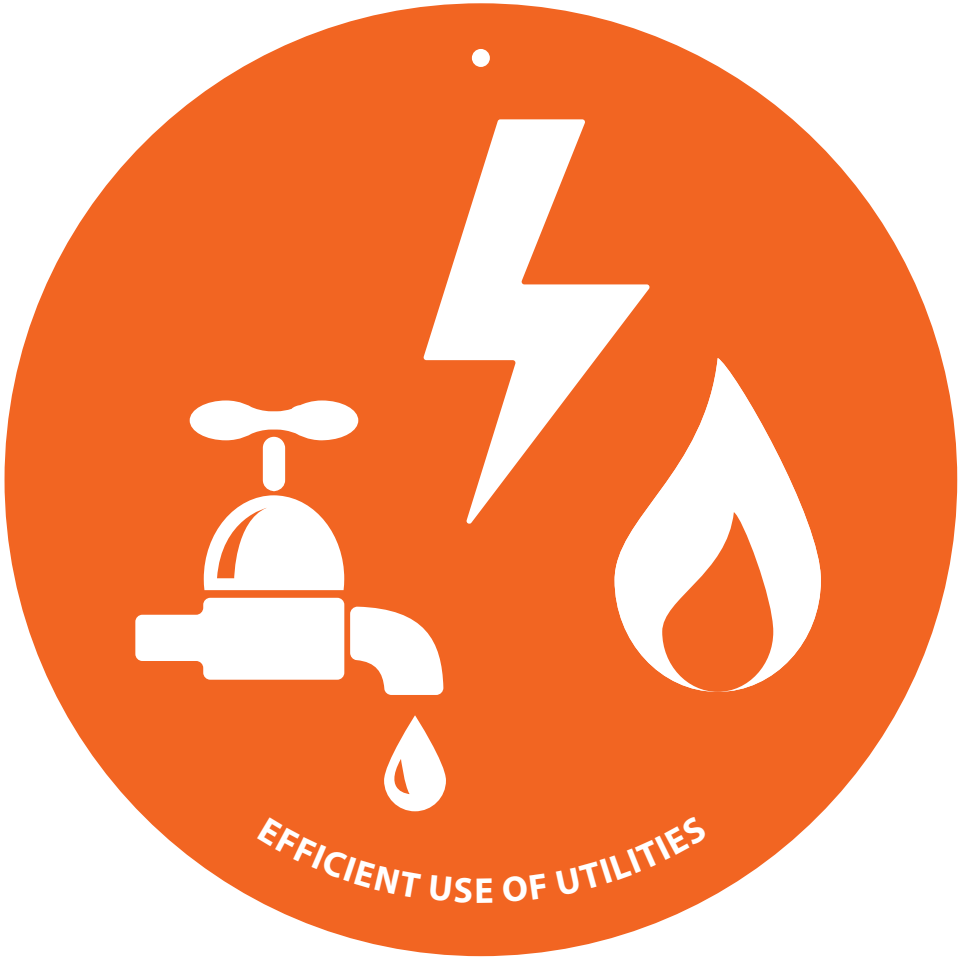
Common Utilities

CHP

CHP

**COST** ₹ ₹ ₹

**IMPACT** ★ ★ ★ ★ ★




## EFFICIENT USE OF UTILITIES

*To achieve energy efficiency, any industrial district must monitor utilities use to ensure an overall efficient use of resources. Efficient utility use can be achieved through the use of energy-efficient products, as well as through monitoring overall facilities use to ensure optimal spatial and organisational strategy. Implementing energy efficiency measures will not only reduce carbon outputs but should also lower costs.*

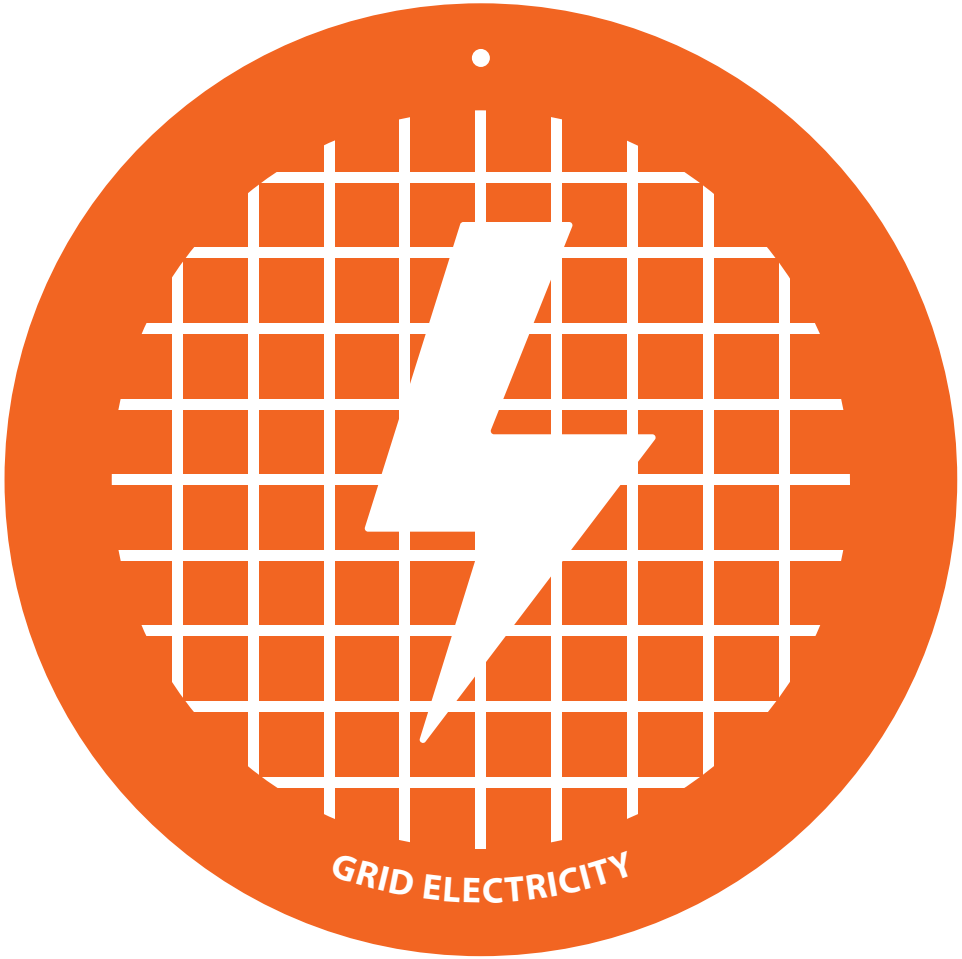
Clean Energy Strategy

Regular Maintenance

Systems Connectivity

**COST** ₹ ○ ○ ○ ○

**IMPACT** ★ ★ ★ ★ ★




# GRID ELECTRICITY

*Grid electricity comprises a network of consumers and power providers, connected by transmission and distribution lines. Generating stations produce power and carry power from stations near a fuel source towards consumers. Grid Resiliency is also a key issue in the context of extreme weather and other outages.*

*(DGNB Reference TEC 1.1)*

Energy Efficiency

Smart Grid

Common Utilities

**COST** ₹ ₹

**IMPACT** ★ ★ ★ ★


## GRID GAS

*A gridded gas system is a transmission infrastructure that passes gas energy from suppliers to consumers. The infrastructure is likely to include transmission lines and pipes, built at a regional scale. Industrial districts should check with their providers to ensure availability for the Industrial District.*

Energy Efficiency

Efficient Use of Utilities

Dynamic Production

**COST** ₹ ₹

**IMPACT** ★ ★ ★ ★


## HIGHWAY CONNECTION

*Highway access can enable efficient freight access to industrial districts, and also ensures regional linkages to partners, suppliers and customers elsewhere in the region. Accordingly, highway access should be prioritised when siting a new industrial park, although multi-modal access – including employee public transport access – is also critical for sustainable transport goals.*

Location

Proximity to Partners

Connectivity

**COST** ₹ ○ ○ ○ ○

**IMPACT** ★ ★ ★ ○ ○


# LANDFILL / RUBBISH MANAGEMENT

*Proactive recycling and materials management processes should ensure that the volume of non-recyclable rubbish is minimal. When substantial rubbish exists, it should be efficiently transported to a landfill, and never be left on site or in the surrounding area due to environmental and health issues.*

Recycling

Rubbish Bin Provision

Waste to Power

**COST** ₹ ₹ ₹

**IMPACT** ★ ★ ★


## MOBILE CONNECTION

*Mobile phones are increasingly popular in India, with an increasing number of users reported each year. Industrial districts should ensure that mobile phone coverage is available on site for the convenience of both employees and customers, and in order to contribute to broader ICT and connectivity goals.*

Broadband Infrastructure

ICT/Smart Technology

Apps

**COST** ₹ ₹

**IMPACT** ★ ★ ★


## OPERABLE WINDOWS

*Many industrial buildings have inoperable windows in order to minimise energy use and control indoor climate conditions. However, this approach limits opportunities for natural ventilation and reduces employees' exposure to the outside world. Green industrial facilities should instead have natural ventilation and air filtration whenever possible, as well as opportunities for individual control of conditions.*

Ventilation

Quality Indoor Working Environment

Passive Design

**COST** ₹ ○ ○ ○ ○

**IMPACT** ★ ★ ★ ○ ○


# PROMOTION OF SAFE TRANSPORT & STORAGE

*Transport, logistics and storage are key aspects of industrial operations and must be monitored for safety and security. Industrial District Management should monitor and evaluate on-site surface transport, storage facilities and procedures for hauling and storing goods, considering safety and efficiency for district operations.*

Freight & Cargo Management

Workplace Safety

Mechanical Unloading

**COST** ₹ ○ ○ ○ ○

**IMPACT** ★ ★ ★ ★ ○


## PROPER SANITATION

*Sanitation is a major issue in India, particularly with regards to water supply. Industrial districts must provide proper sanitation facilities to their employees, including clean water, toilets, sinks and hand-washing facilities – as well as the necessary protective gear relevant to their work. This not only will positively impact employee health, but also contribute to the health of the surrounding environment and communities.*

Public Toilet Provision

Quality Indoor Working Environment

Well-being

**COST** ₹ ○ ○ ○ ○

**IMPACT** ★ ★ ★ ★ ★


## RECYCLING

*The process of converting waste into new materials, recycling reduces the need for waste disposal. Recyclable materials, such as glass, plastic, paper, metal and electronics, are key to most industrial districts' operations and should be sorted and managed for reprocessing. Local recycling infrastructure is currently well-developed in India and similar processes should be incorporated and formalised an industrial district's sustainability strategy.*

Upcycled Materials

Environmental Stewardship

Circular Economy

**COST** ₹ ○ ○ ○ ○

**IMPACT** ★ ★ ○ ○ ○


# REGULAR MAINTENANCE

*Regular Maintenance is critical to maintain building conditions and cut costs for long-term building improvements. Consistent inspections, maintenance tasks and repairs allow building managers to be aware of a building's condition and address problems before pressing structural and safety issues emerge.*

*(DGNB Reference TEC 1.5)*

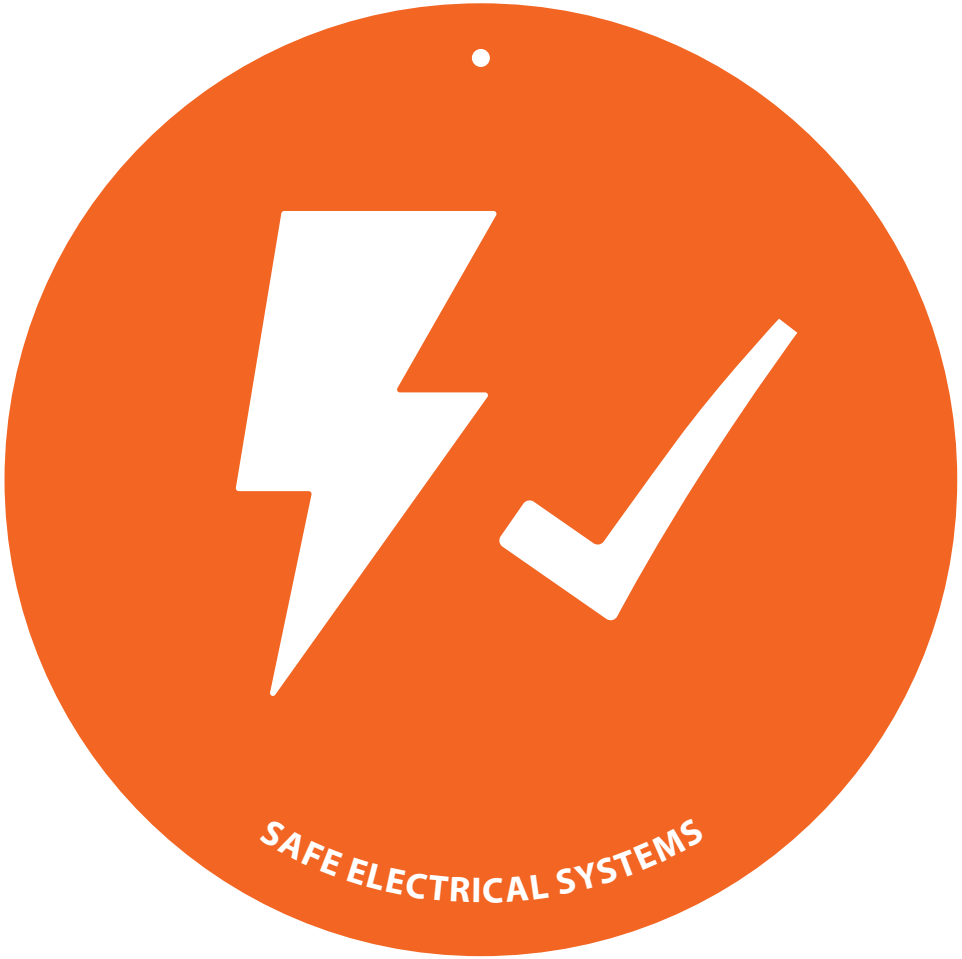
Post-Occupancy Evaluation

Industrial Zone Management

Cost-cutting

**COST** ₹ ₹

**IMPACT** ★ ★ ★ ★ ★




## SAFE ELECTRICAL SYSTEMS

*Employees working in an industrial setting are at risk of exposure to electrical live wires and other hazards if an industrial district does not have the proper protective mechanisms. Safe electricity systems must be installed, monitored and well-maintained, to ensure employee safety and the safety of the industrial district as a whole.*

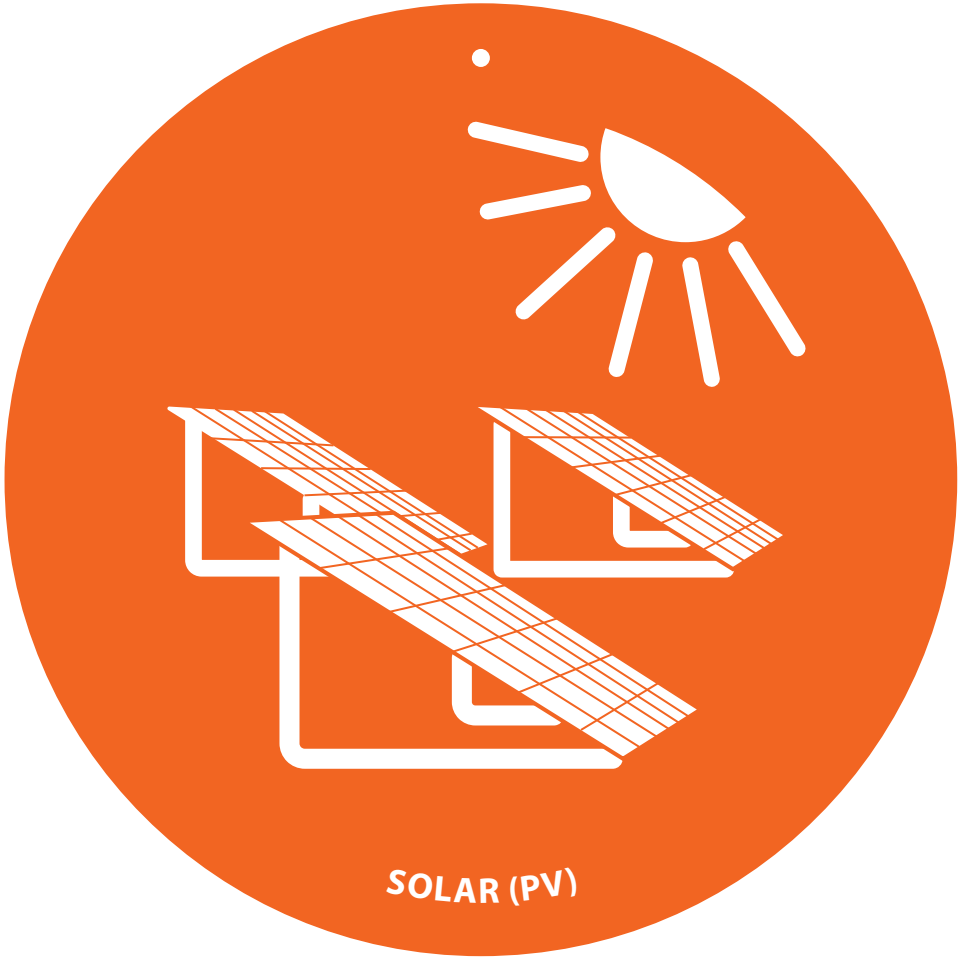
Regular Maintenance

Workplace Safety

Low Voltage Power

**COST** ₹ ₹

**IMPACT**




## SOLAR (PV)

*Solar panels, or photovoltaic (PV), generate electricity by catching the sun's energy. This renewable energy source not only cuts down on a facility's carbon footprint, but also can significantly lower electricity bills.* *(DGNB Reference TEC 2.1)*

Energy Performance Contracting

Clean Energy Strategy

Minimisation of Green House Gases

**COST** ₹ ₹

**IMPACT** ★ ★ ★


# VENTILATION

*Building ventilation is critical to employee comfort. Natural ventilation can improve indoor environmental quality, reduce Indoor or other sources of discomfort, and reduce energy consumption by minimising the use of artificial climate control. Natural ventilation systems comprise an airflow circuit through a building, including windows, doors and other openings to circulate airflow.* *(DGNB Reference SOC 1.8)*

Building Orientation

Quality Indoor Working Environment

Cost-cutting

**COST** ₹ ○ ○ ○ ○

**IMPACT** ★ ★ ★ ★ ○


## VIRTUAL COMMUNICATION

*E-Mail and other means of virtual communication offer employees the ability to communicate efficiently within and beyond the confines of an industrial district. E-mail, or other forms of e-communication, should be utilised in the context of the workplace, and will also enable companies to better tap into the opportunities presented by other applications and communications technologies.*

Apps

Data Security

Cloud-based Systems

**COST** ₹ ○ ○ ○ ○

**IMPACT** ★ ★ ★ ○ ○


# BIKE COMMUTING

*Bicycling is well-known to be one of the healthiest, cheapest and most environmentally friendly ways to travel. Industrial districts can facilitate employees' bike commutes through incentives, whether financial or otherwise. Provisions for cycling, such as bike racks and bike lanes, should also be considered in the design of the public realm.*

*(DGNB Reference TEC 3.1)*

Multi-modal Transport

Sharing Economy

Well-being

**COST**

**IMPACT**


## BIKE SHARING

*Bike sharing systems are services in which individuals – whether members of a company or community, or the general public – are able to use bikes on a short-term, shared basis. Industrial districts can implement system bike share systems to help employees get around, saving time and improving health.* *(DGNB Reference TEC 3.1)*

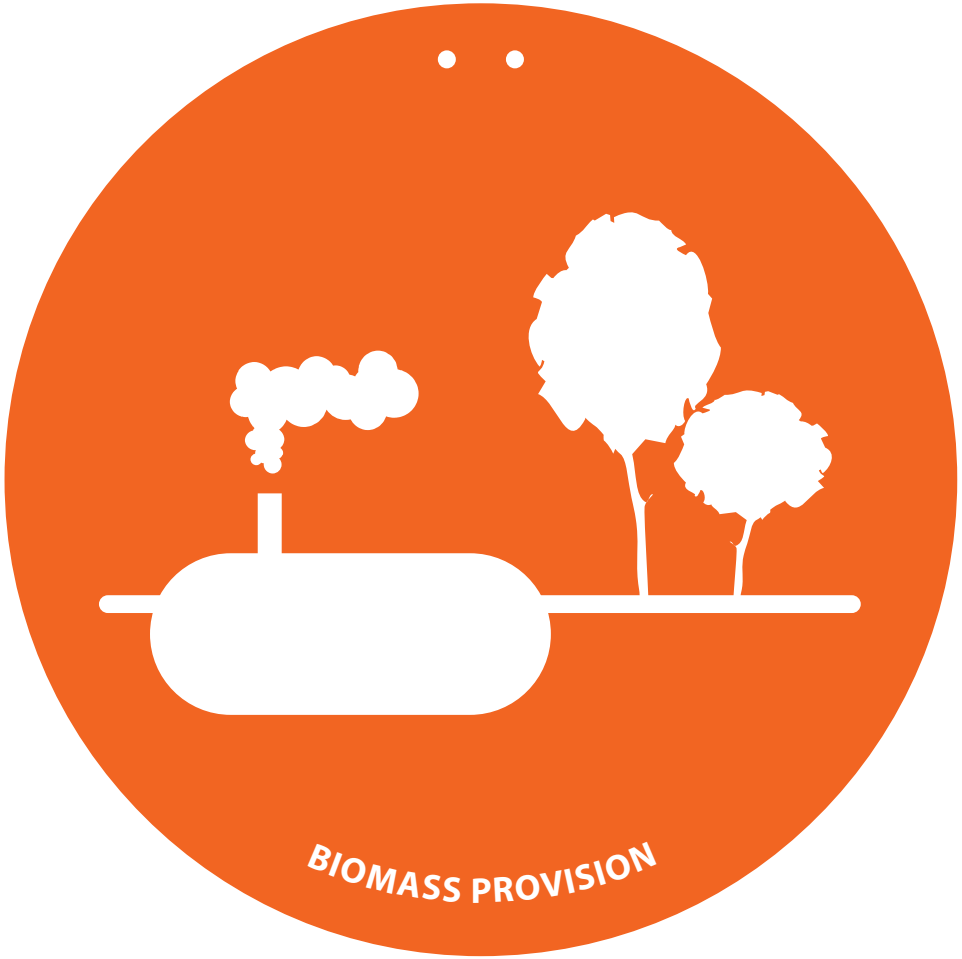
Employee Transport

Sharing Economy

Well-being

**COST** ₹ ₹ ○ ○ ○

**IMPACT** ★ ★ ○ ○ ○




## BIOMASS PROVISION

*Biomass is plant-based material that can be converted to biofuel by thermal, chemical or biochemical methods and then used to conduct heat. Biofuel is an attractive option for renewable energy provision, and can be used as a fuel for vehicles or as a diesel addictive. Using biofuel can offer substantial carbon savings, contributing to a broader carbon minimisation strategy.*

*(DGNB Reference TEC 2.1)*

Organic Sources

Clean Energy Strategy

Minimisation of Green House Gases

**COST** ₹ ₹ ₹

**IMPACT**


# CARDBOARD MANAGEMENT

*Cardboard, including packing boxes and packaging materials, is one frequently-used material which is easy to recycle. Industrial districts should ensure that cardboard recycling is underway and may also look into upcycling, which is the process of transforming waste materials into something of greater value.*

Upcycled Materials

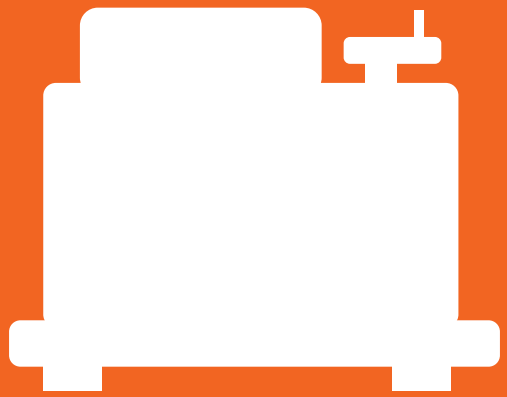
Organic Composting

Waste to Power

**COST** ₹ ○ ○ ○ ○

**IMPACT** ★ ○ ○ ○ ○

# CHP



CHP

CHP

## Combined Heat and Power (CHP)

*Combined Heat and Power (CHP) generates usable heat and power together in a highly-efficient, on-site process. The process generates electricity and captures usable heat, in contrast to the more wasteful approach of coal and gas-fired power stations. Due to on-site production, CHP also has the benefit of avoiding energy losses during transmission and distribution of the electricity.*

Energy Efficiency

Resource Integration

Common Utilities

**COST** ₹ ₹ ₹ ₹

**IMPACT** ★ ★ ★ ★


## CONGESTION REDUCTION

*Traffic congestion refers to a road network condition, in which vehicles are obstructed or unable to move due to high volume of traffic. Congestion not only leads to substantial CO2 emissions, but also is highly inconvenient and demoralising for employees. Industrial Districts can employ a number of methods to reduce congestion, such as selecting a location near mass transport, incentivising car-sharing and carpooling and encouraging compliance with traffic regulations.* *(DGNB Reference TEC 3.1)*

Access to Mass Transport

Well-being

Minimisation of Green House Gases

**COST** ₹ ₹

**IMPACT** ★ ★ ★ ★


# CONSTRUCTED WETLANDS

*Beyond managing stormwater and providing an aesthetic landscape feature, constructed wetlands can provide natural effluent treatment. In fact, wetlands can provide similar contaminant reductions to treatments carried out with mechanical equipment.* *(DGNB Reference ENV 1.4)*

Irrigation Systems

Stormwater Management

Biodiversity Preservation

**COST** ₹ ₹ ○ ○ ○

**IMPACT** ★ ★ ★ ○ ○


# COOLING RECOVERY

*Cooling recovery, or energy recovery ventilation, exchanges energy contained in building air and then uses it to treat incoming ventilation air from HVAC systems. This energy recovery process reduces HVAC equipment capacity while improving indoor air quality.*

*(DGNB Reference TEC 2.1)*

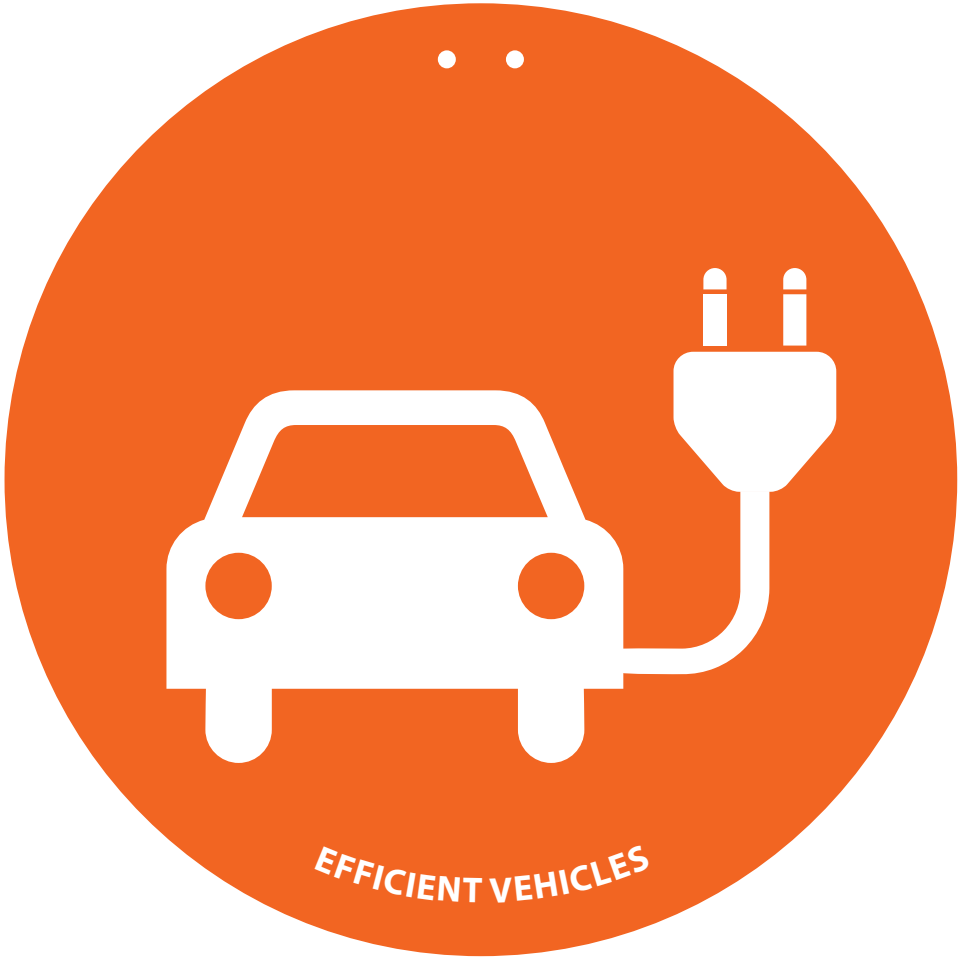
Energy Efficiency

Resource Integration

Quality Indoor Working Environment

**COST** ₹ ₹ ₹

**IMPACT** ★ ★ ★ ★




## EFFICIENT VEHICLES

*Electric mobility, or e-mobility, refers to the use of electric vehicles, plug-in hybrids and other electric-powered technologies. This low-carbon transportation method presents tremendous opportunities for the future, as it is less dependent on fossil fuels and produces fewer emissions. E-mobility can be tested by a company with pilot projects such as electric car shares, delivery vehicles or service fleets.* *(DGNB Reference TEC 3.1)*

Multi-modal Transport

Air Quality Monitoring

Battery Based Systems

**COST** ₹ ₹ ○ ○ ○

**IMPACT** ★ ★ ○ ○ ○


# EMPLOYEE TRANSPORT

*Providing employee transport can both improve efficiency of operations and employee quality of life. Some business parks may choose to provide transport on site, between key facilities or destinations. Others may also choose to offer or subsidise some form of transport from nearby mass transport stations to improve employee commutes.* *(DGNB Reference TEC 3.1)*

Access to Mass Transport

Sharing Economy

Scooter Share

**COST** ₹ ₹

**IMPACT** ★ ★ ★


# FREIGHT & CARGO MANAGEMENT

*The transport of goods by truck, air or rail is a critical part of most industries' supply chains and the overall industrial process. Industrial district managers should develop a cargo management strategy, ensuring ease of access for cargo vehicles onto the industrial premises, while also considering spatial efficiency, fuel use, public realm design and employee safety.* *(DGNB Reference TEC 3.6)*

Congestion Reduction

Promotion of Safe Transport and Storage

SEZ

Special Economic Zones

**COST** ₹ ○ ○ ○ ○

**IMPACT** ★ ★ ★ ★ ○


## LIMITED ONSITE POWERLINES

*Contact with high-voltage power lines is extremely dangerous, and so working with power lines on-site can be a high-risk endeavour. Beyond this, power lines are not conducive to pleasant public or industrial park space. Industrial Districts should aim to limit on-site exposure to power lines both when selecting a new site and expanding operations on an existing site.*

Location

Workplace Safety

Open Public Space

**COST** ₹ ₹

**IMPACT** ★ ★ ★ ★


## MULTIMODAL TRANSPORT

*Multimodal transport comprises transport of more than one type, such as rail, bus and freight. Planning for multi-modal transport ensures that people and goods can move smoothly and efficiently across a region, taking advantage of lower-carbon options provided by mass transport provisions.* *(DGNB Reference TEC 3.1)*

Access to Mass Transport

Efficient Vehicles

Connectivity

**COST** ₹ ₹

**IMPACT** ★ ★ ★ ★


## PASSIVE DESIGN

*Passive design maximises the use of 'natural' sources of heating, cooling and ventilation to create comfortable conditions inside buildings. It harness environmental conditions such as solar radiation, cool night air and air pressure differences to drive the internal environment. Passive measures do not involve mechanical or electrical systems.*

Building Orientation

Energy Efficiency

Ventilation

**COST** ₹ ○ ○ ○ ○

**IMPACT** ★ ★ ★ ★ ○


## REUSED BUILDING STOCK

*Reusing building stock is one strategy for lower-impact construction. Whether reusing intact infrastructure or structural materials such as bricks or masonry, this practice reduces the volume of waste generated on a construction site and can save money by reducing the need for new materials.*

Building Inventory

Reduced Demolition

Brownfield Redevelopment

**COST** ₹ ₹

**IMPACT** ★ ★ ★


# STORMWATER MANAGEMENT

*Stormwater, including rainwater and other run-off from streets and lawns, can be managed through natural processes as well as municipal sewer systems. Best practice in stormwater management, or SUDS (Sustainable Urban Drainage Systems) include rain gardens, swales, permeable pavement, green roofs, rain barrels and soil amendments.* *(DGNB Reference TEC 2.3)*

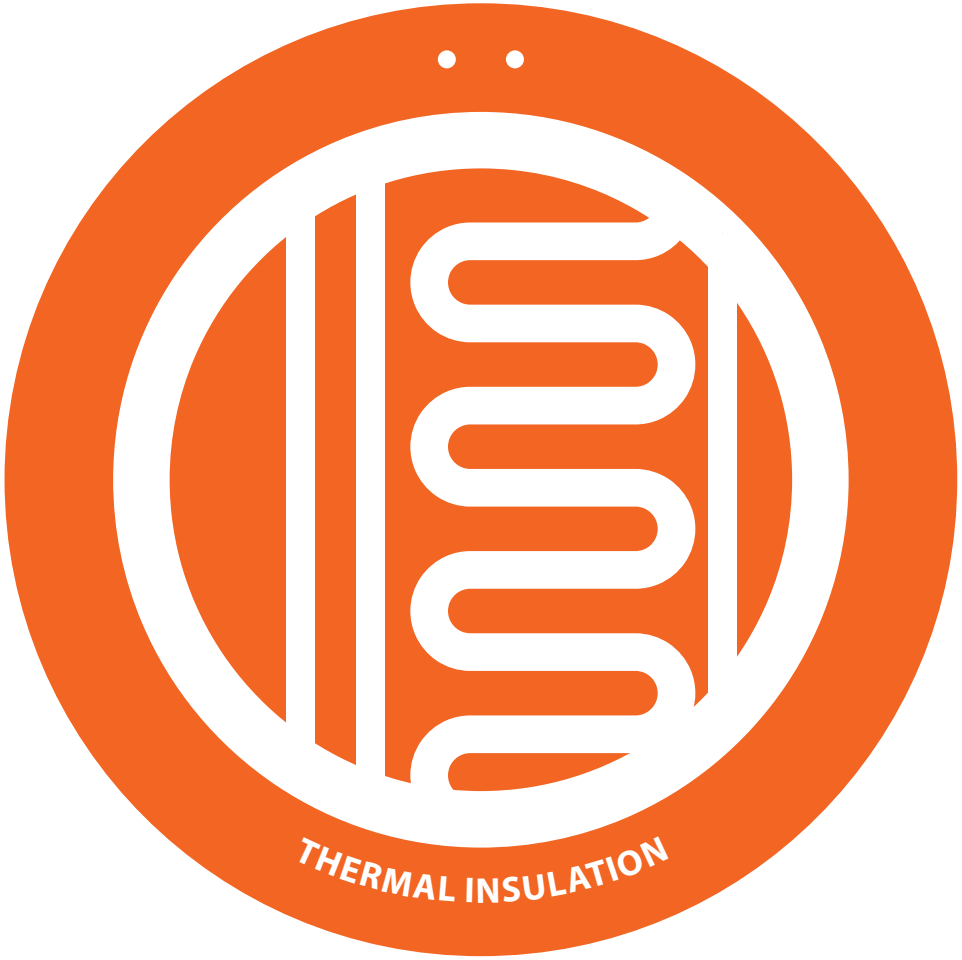
Open Public Space

Resource Efficient Landscape

Green Roof Systems

**COST** ₹ ₹

**IMPACT** ★ ★ ★




# THERMAL INSULATION

*Thermal insulation is the process for insulation against heat transfer, often by using a material of low heat conductivity which can shield a volume from loss or entrance of heat. Thermal insulation reduces energy usage and saves costs by reducing the loss of heat or coolness within a building.*

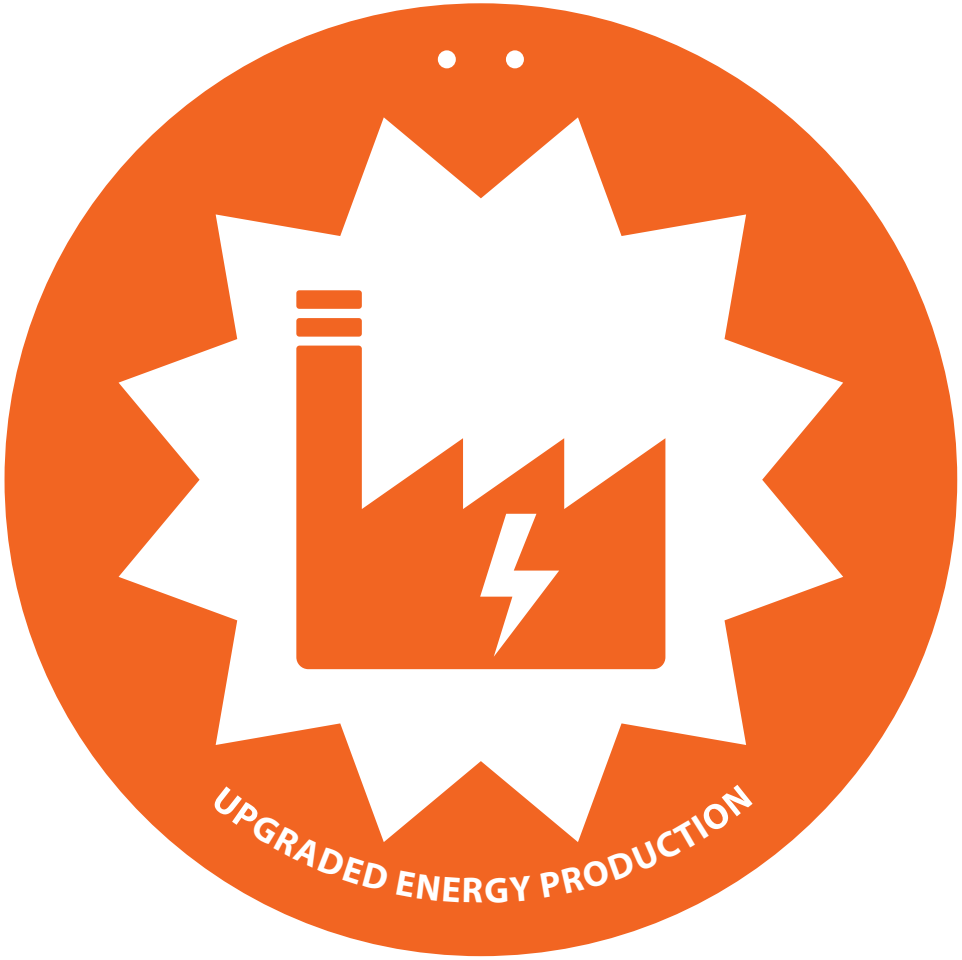
Energy Efficiency

Green Building

Minimisation of Green House Gases

**COST** ₹ ₹ ₹ ○ ○

**IMPACT** ★ ★ ★ ○ ○




# UPGRADED ENERGY PRODUCTION

*As part of a comprehensive renewables strategy, industrial parks should consider their means of energy production and how to upgrade into renewable sources. Renewables, particularly if installed with subsidies or other assistance programs, will not only reduce environmental impact but also may provide operational cost savings.* *(DGNB Reference TEC 2.1)*


Incentives for Green Buildings


CHP

Cost-cutting

**COST** ₹ ₹ ₹

**IMPACT** ★ ★ ★ ★ ★


## WASTE MANAGEMENT & REDUCTION

*Industries, regardless of their size, should have a clear agenda on the generation, prevention, characterisation, monitoring, treatment, handling, reuse and ultimate residual disposition of solid waste. It is a topic to be dealt with at Management level and requires constant updating, utilising new products or production processes being put in place. Emphasis should be placed on integrated approaches that require the blending of technical and non-technical factors.*

Hazardous Waste Treatment

By-Product Connection

Landfill/ Rubbish Management

**COST** ₹ ₹ ₹ ○ ○

**IMPACT** ★ ★ ★ ○ ○


## APPROPRIATELY SIZED ROADS

*Roads in Industrial Districts should be capable to handle current and future demand for all traffic participants. A multigrain street network should be developed in stages appropriate to the Industrial Park development, based on a sound traffic analysis. Roadside truck parking, cycling and pedestrian comfort as well as artificial lighting and shading to be considered.*

Active Streets

Congestion Reduction

Freight & Cargo Management

**COST** ₹ ₹ ₹

**IMPACT** ★ ★ ★


## APPS

*Mobile phone applications, or apps, are computer programs which run on smart phones or tablets and which can provide a highly individualised user experience. While not necessary for industrial work, many apps present opportunities for efficiency and on-the-ground documentation and analysis which could be useful to operations. A company tech strategy should consider the use of apps and how they could contribute to productivity in the workplace, and make the workplace safer.*

IT Management

Data Security

Remote Service

**COST** ₹ ○ ○ ○ ○

**IMPACT** ★ ★ ○ ○ ○


# CETPs
# (COMMON EFFLUENT TREATMENT PLANTS)

*Effluent Treatment Plants, or ETPs, are a type of wastewater treatment plant, managing the outflowing of water or gas. Common Effluent Treatment Plants, or CETPs, create economies of scale by combining effluents for treatment from several facilities, allowing for shared operation and maintenance costs.*

*(DGNB Reference ENV 2.2)*

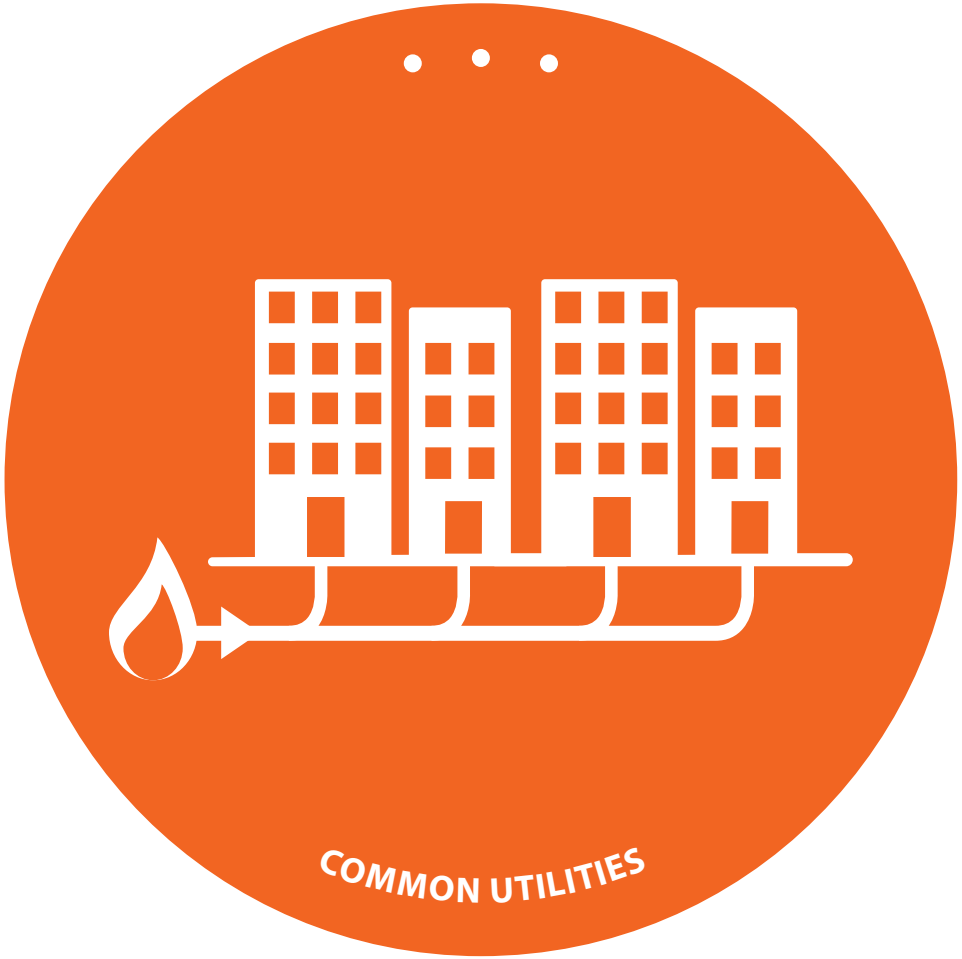
Water Treatment System

Collaboration among Industries

Common Utilities

**COST** ₹ ₹ ₹ ₹

**IMPACT** ★ ★ ★ ★




## COMMON UTILITIES

*Industrial districts with more than one facility or company on-site should consider common utilities strategies, to reduce costs by creating economies of scale with energy, water and cooling provisions. A common utilities strategy can also enable investment in more renewable technologies should the opportunity arise.*

*(DGNB Reference ENV 1.1)*

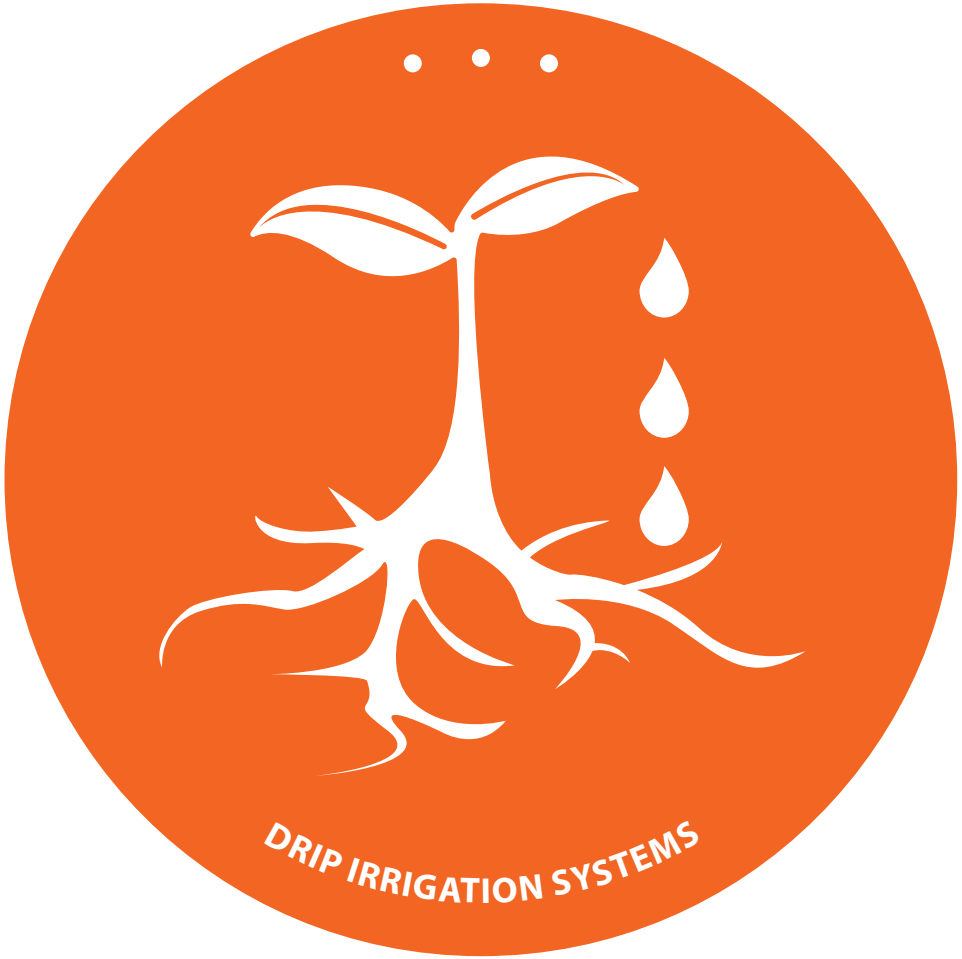
Upgraded Energy Production

Resource Integration

Cost-cutting

**COST** ₹ ₹ ○ ○ ○

**IMPACT** ★ ★ ★ ○ ○




# DRIP IRRIGATION SYSTEMS

*Drip Irrigation, or micro irrigation, is an irrigation method that drips water onto the roots of plants, working with a network of valves or pipes to reach the root base directly. The method minimises fertilizer use and preserves water by reducing evaporation and drainage. Drip irrigation can also minimise exposure to diseases spread through irrigation water.* *(DGNB Reference ENV 2.2)*

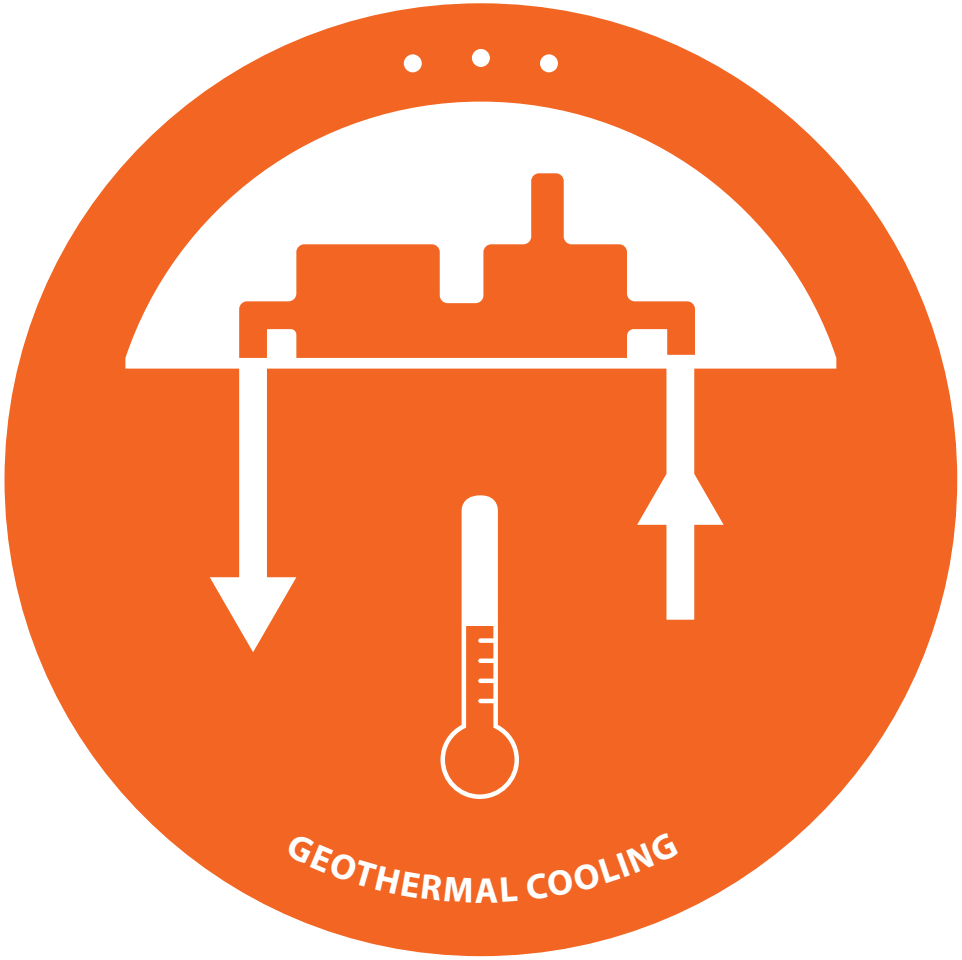
Water Preservation

Resource Efficient Landscape

Energy Efficiency

**COST** ₹ ₹ ₹ ○ ○

**IMPACT** ★ ★ ★ ○ ○




# GEOTHERMAL COOLING

*Geothermal heat pumps are cooling or heating systems which transfer cool or hot air to and from the ground. These cooling systems can be used alongside solar heating systems and can both reduce the operational costs of heating and cooling systems and increase efficiency.* *(DGNB Reference ENV 1.1)*

Energy Efficiency

Minimisation of Green House Gases

Cost-cutting

**COST** ₹ ₹ ₹ ₹

**IMPACT** ★ ★ ★ ★


# INDUSTRIAL DISTRICT WIFI

*Wireless internet, or Wi-Fi, is becoming increasingly common in private, public and commercial spaces. Providing Wi-Fi within the Industrial District enables swift communications and data sharing, as well as enhanced employee experience.*

Broadband Infrastructure

Cyber Physical Systems

Apps

**COST** ₹ ₹ ○ ○ ○

**IMPACT** ★ ★ ★ ★ ○


# LOAD MANAGEMENT

*Load management, or demand-side management, comprises the systems which balance the electrical load with the supply of electricity. This supply-demand balance can be achieved through timing clocks, circuit breaker or tariffs or pricing schemes designed to influence energy use. If an industrial district provides load management for the wider area, power supply may be more reliable, with fewer black outs.*

Clean Energy Strategy

Minimisation of Green House Gases

Cost-cutting

**COST** ₹ ₹ ₹ ○ ○

**IMPACT** ★ ★ ★ ★ ○


## THERMAL STORAGE USAGE

*Thermal Energy Storage collects excess thermal energy for later use by buildings, districts or even larger town or regional scales. Thermal energy storage is a good strategy to maximise the use of energy outputs, with sources including solar facilities, heat pumps, CHP plants and excess heat from industrial systems.*

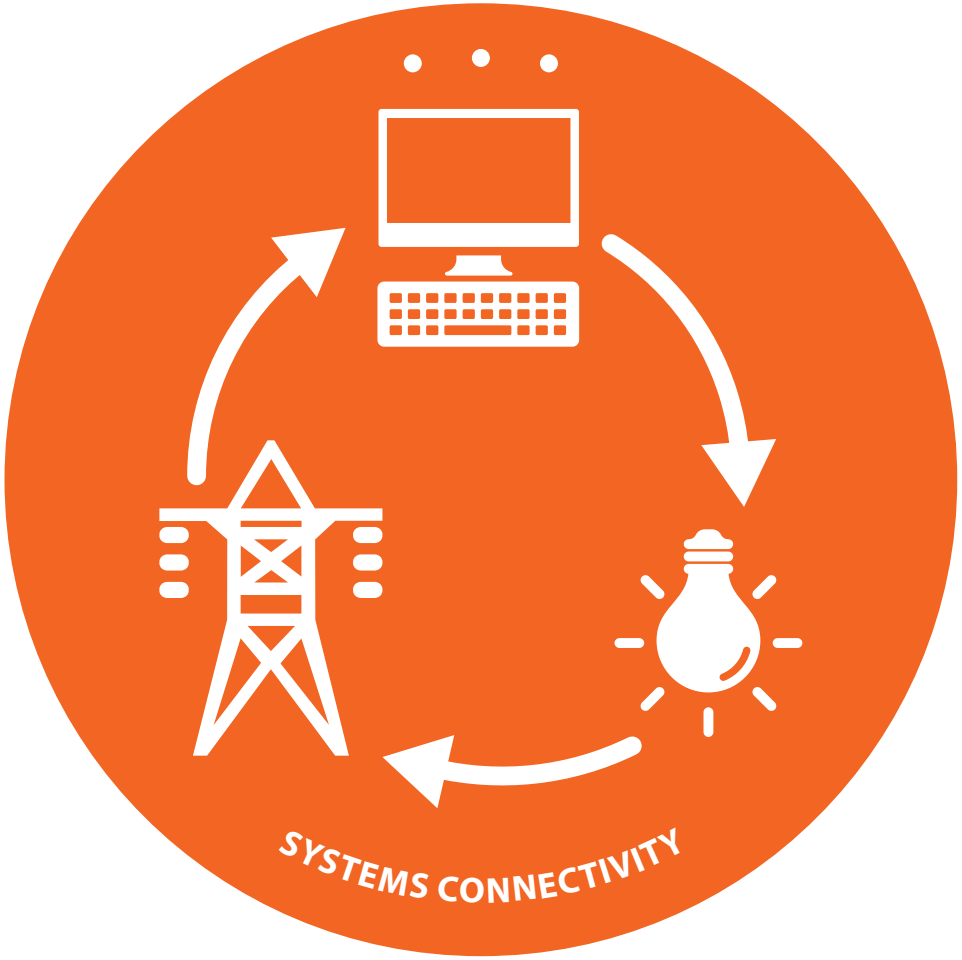
Energy Efficiency


CHP

Clean Energy Strategy

**COST** ₹ ₹ ₹ ₹

**IMPACT** ★ ★ ★ ★




## SYSTEMS CONNECTIVITY

*Industrial Districts showcase a series of smart systems, real-time data generating appliances and tools that are often not connected. An inventory of existing or planned systems could be connected generating synergies for the individual enterprise and the industrial park at large leading to better projections, fewer redundancies and streamlined system investments.*

System Thinking

Collaboration among Industries

Smart Grid

**COST** ₹ ₹ ₹

**IMPACT** ★ ★ ★ ★


# SEGWAY MOBILITY

*Large industrial districts can benefit from providing their employees with mobility options within the district itself, or even within warehouse buildings. While well-known for recreational usage, Segway's can also be efficiently used for mobility purposes, especially in logistical contexts when tools or cargo need to be transported. These self-stabilising, two-wheeled vehicles can also accommodate communications technology and are battery powered, meaning they emit fewer greenhouse gases than cars - and are fun to use.* *(DGNB Reference TEC 3.1)*

Campus Atmosphere

Connectivity

Multi-modal Transport

**COST** ₹ ○ ○ ○ ○

**IMPACT** ★ ★ ★ ○ ○


## SCOOTER SHARE

*Providing scooter sharing on site can improve the mobility of the employees on site but also enhance their commuting choices. Scooter sharing stations can be located near mass transit stops or at key destinations within the park and hence improve the multimodal transport offer. If scooter are powered by electricity they will also emit lower emissions than conventional transport offers. Scooter sharing will also require a booking system, which may be provided through apps.* *(DGNB Reference TEC 3.1)*

Employee Transport

Sharing Economy

Multi-modal Transport

**COST** ₹ ○ ○ ○ ○

**IMPACT** ★ ★ ★ ○ ○


## NIGHT STORAGE COOLING

*Thermal energy storage can collect and store excess thermal energy at the building or district scale. This energy can be used for cooling, as well as heating, power generation and other industrial processes. With night storage applications, day-time and night-time energy needs are balanced, with seasonal functions available – for example, cool winter air can be stored for summer cooling.*

*(DGNB Reference TEC 2.1)*

Energy Efficiency

Smart Grid

Clean Energy Strategy

**COST** ₹ ₹

**IMPACT** ★ ★ ★ ★


# MINIMISED OIL DEPENDENCY

*Many industrialised nations are currently extremely oil dependent, relying on oil imports for many of their energy needs. This situation is unsustainable in terms of environmental consequences, as well as costs and international trade dependencies. Industrial districts which operate using renewable energy sources and with a minimized oil dependency will be not only more environmentally friendly but also more resilient to future market changes if petroleum becomes less available.*

Clean Energy Strategy

Minimisation of Green House Gases

Environmental Stewardship

**COST** ₹ ₹

**IMPACT** ★ ★ ★ ★ ★


## MECHANICAL UNLOADING

*The effective management of loading and unloading is an essential component to be ahead of competitors. The number of loading docks are often limited and paired with time intense manual loading/unloading procedures. Often there are no waiting areas for trucks on the premise leading to congestion of public roads. Mechanical unloading can allow for more efficient loading procedures and reduce the risk of accidents/pollutant exposure and product damage.*

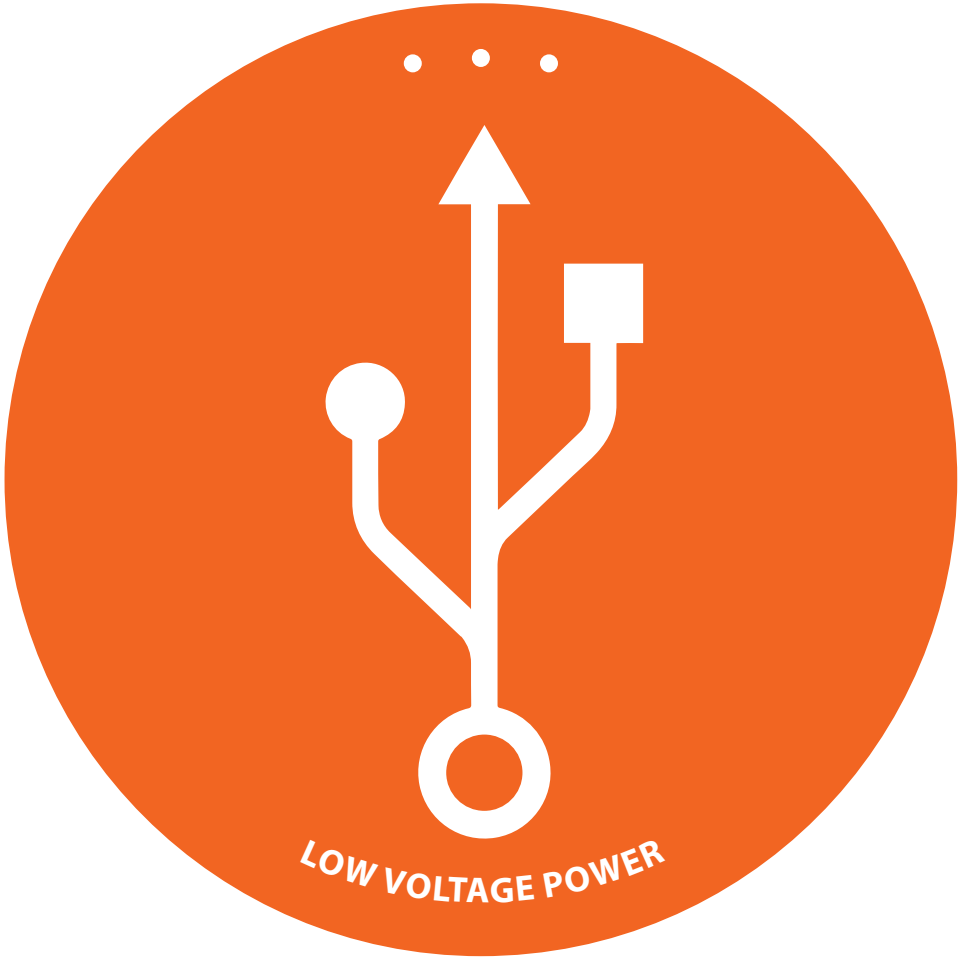
Spatial Efficiency

Workplace Safety

Freight & Cargo Management

**COST** ₹ ₹ ₹ ○ ○

**IMPACT** ★ ★ ★ ○ ○




## LOW VOLTAGE POWER

*Low-voltage power refers to electricity which can operate under low voltage support, reducing electricity demand. Using low voltage power – ideally generated by on-site photovoltaic - should lead to lower electricity costs, fewer electrical faults and reduced carbon footprint. The systems are also likely to have durability and safety benefits.* *(DGNB Reference TEC 2.1)*

Safe Electricity Systems

Workplace Safety

Grid Electricity

**COST** ₹ ₹

**IMPACT** ★ ★ ★


## WASTE TO POWER

*Waste to Power is the process of creating energy through waste incineration. Waste to Power plants can produce heat as well as electricity, and often produce combustible fuels, such as ethanol, methane of methanol. The process is both a method for disposal of "clean trash" and a promising renewable energy source.*

*(DGNB Reference TEC 2.1)*

Landfill/
Rubbish Management

Clean Energy
Strategy

Resource
Integration

**COST** ₹ ₹ ₹ ₹

**IMPACT** ★ ★ ★ ★


## WIND POWER

*Wind Power extracts energy from air flow, harnessing this through wind turbines or sails. This renewable energy offers an alternative to fossil fuels, produces no greenhouse gases and can be locally generated. Currently the world's fastest growing energy sector, wind power is also relatively cost effective in comparison to other renewable technologies.* *(DGNB Reference TEC 2.1)*

Energy Performance Contracting

Urban Framework

Minimisation of Green House Gases

**COST** ₹ ₹ ₹ ₹

**IMPACT** ★ ★ ★ ★ ★


WILDCARD
COST
IMPACT
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