

建材行业绿色工厂的创建与评价

Establishment and Assessment of Green Building Material Factories

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中国建筑材料联合会
绿色低碳建材分会



国建联信认证中心
Guojian Lianxin Certification Center



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1. 绿色制造工程的政策背景

Policy Background of Green Manufacturing Projects

2. 建材行业绿色工厂的创建

Establishment of Green Factories in the Building Materials Industry

3. 建材行业绿色工厂的评价

Assessment of Green Factories in the Building Materials Industry





1

绿色制造工程的政策背景

Policy Background of Green Manufacturing Projects



政策的顶层设计 Top-level Policy Design

十三五规划纲要
13th Five-year Plan outline

第5篇 优化现代产业体系
Chapter 5 Optimize the Modern Industrial System

第22章 实施制造强国战略
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第2节 加快发展新型制造业：
Article 2 Accelerate the Development of New Manufacturing Industries:
“实施绿色制造工程，推进产品全生命周期绿色管理，构建绿色制造体系”

“Implement green manufacturing projects, promote green management of products throughout the life cycle and build green manufacturing systems”



《工业绿色发展规划》
Green Industrial Development Planning

《中国制造2025》
Made in China 2025

《绿色制造工程实施指南》
Implementation Guidelines for Green Manufacturing Projects



绿色制造水平明显提升

Green manufacturing level significantly improved

- ①重点行业主要污染物排放强度下降20%
Intensity of major pollutant emissions of key industries decreases by 20%
- ②工业固体废物综合利用率达到73%
Utilization rate of Industrial solid waste reaches 73%
- ③规模以上单位工业增加值能耗下降18%
Energy consumption per unit industrial added value above the designated size decreases by 18%
- ④吨水泥综合能耗降至85千克标准煤
Comprehensive energy consumption per ton of cement reduced to 85 kgce
- ⑤单位工业增加值CO₂排放量下降22%
CO₂ emissions per unit industrial added value decrease by 22%
- ⑥单位工业增加值用水量下降23%
Water consumption per unit industrial added value decreases by 23%
- ⑦电机、锅炉系统运行效率提高5%
The operation efficiency of motor and boiler system increases by 5%

绿色制造体系初步建立

Preliminary green manufacturing systems established

- ①建立健全绿色标准
Put in place green standards
- ②开发推广万种绿色产品
Develop and promote 10,000 varieties of green products
- ③创建1000家绿色示范工厂
Establish 1,000 green demonstration factories
- ④创建100家绿色工业园区
Establish 100 green industrial parks
- ⑤在重点行业初步建立绿色供应链管理体系
Establish preliminary green supply chain management systems in key industries



绿色制造： 在保证产品的功能、质量、成本的前提下，综合考虑环境影响和资源效率的现代制造模式，通过开展技术创新及系统优化，使产品在设计、制造、物流、使用、回收、拆解与再利用等全生命周期过程中，对环境的影响最小、资源能源利用率最高、人体健康与社会危害最小，并使企业经济效益与社会效益协调优化。

Green manufacturing: A modern manufacturing mode that comprehensively considers environmental impacts and resource efficiency under the premise of ensuring the function, quality and cost of the products. Through technological innovation and system optimization, the mode minimizes environmental impacts, human health and social harm, maximizes the utilization rate of resource and energy, and coordinates and optimizes the economic and social benefits of the enterprise during the whole product life cycle, including design, manufacturing, logistics, use, recycling, disassembly and reuse.

——《绿色制造科技发展“十二五”专项规划》12th Five-Year Plan for the Development of Green Manufacturing Technology

A 产品设计生态化： 在设计开发阶段就要综合考虑全生命周期的资源环境影响；

Ecological product design: It is necessary to comprehensively consider the resource and environmental impacts of the whole life cycle in the design and development phase;

E. 产业耦合一体化： 企业间资源利用效率提升和污染物减排。

Integrated industrial coupling: Improve resource utilization efficiency and pollutant emission reduction among enterprises.

B 生产过程清洁化： 从源头提高资源利用效率，减少或避免污染物产生；

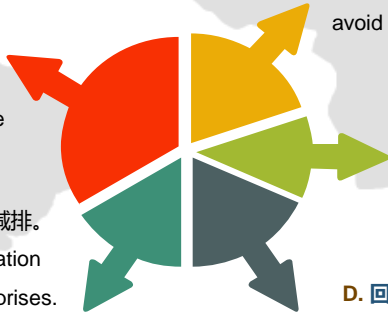
Clean production process: Improve the resource utilization rate from the source, reduce or avoid the generation of pollutants;

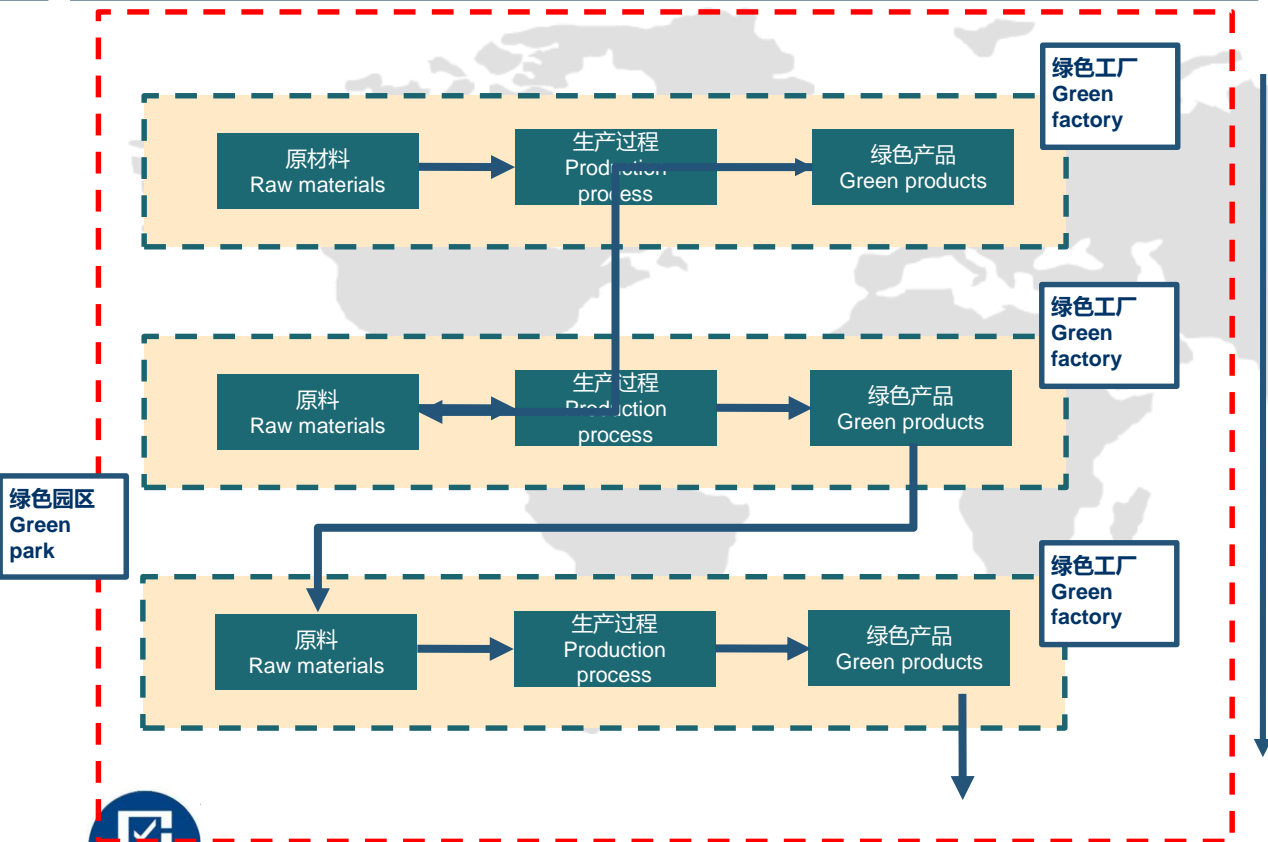
C. 能源利用高效化： 生产过程节能和终端用能产品能效水平提升；

Efficient energy use: Improve the energy efficiency in the production process and of the energy efficiency during the use phase of the product;

D. 回收再生资源化： 使原本废弃的资源再次进入产品的制造环节；

Resource re-utilisation: Waste resources can re-enter the manufacturing process of the product;

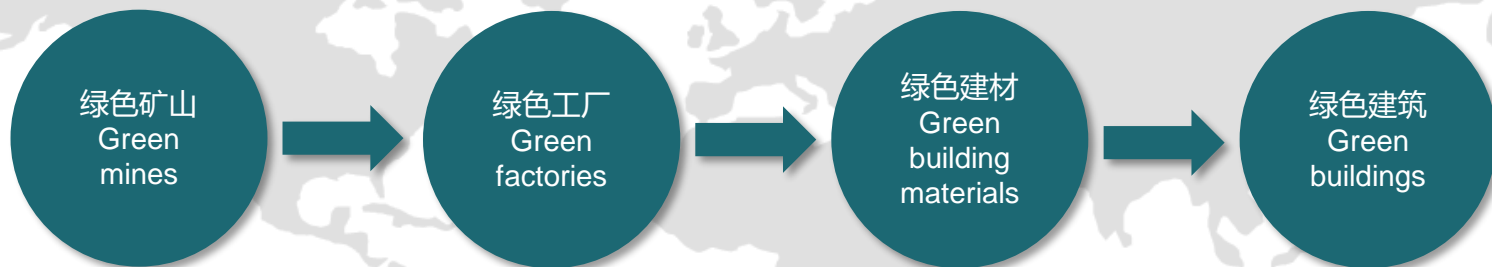




以企业为主体，以标准为引领，以绿色产品、绿色工厂、绿色工业园区、绿色供应链为重点，以绿色制造服务平台为支撑，推行绿色管理和认证，加强示范引导，全面推进绿色制造体系建设。

With enterprises as the mainstay and standards as the guide, focus on green products, green factories, green industrial parks and green supply chains, implement green management and certification, strengthen demonstration and guidance, and comprehensively promote the development of green manufacturing systems backed by green manufacturing service platforms.





基础设施与建筑领域是国民经济发展的基础性行业，从矿山到建材到建筑的生命周期过程，消耗了全社会总能源的**40%**左右。各行业协调打造绿色供应链，是建材全生命周期降低环境影响的关键。

Infrastructure and construction is a basic industry for the development of the national economy. From mines to building materials and to the life cycle of buildings, the industry consumes about 40% of the total energy of the whole society. Building a green supply chain through the coordination among various industries is the key to reduce the environmental impact of the cycle of building materials throughout the whole life.

《关于开展绿色制造体系建设的通知》

Notice on Building Green Manufacturing Systems

工业和信息化部办公厅

工信厅节函〔2016〕586号

工业和信息化部办公厅关于 开展绿色制造体系建设的通知

各省、自治区、直辖市及计划单列市、新疆生产建设兵团工业和信息化主管部门：

为贯彻落实《中国制造2025》、《绿色制造工程实施指南（2016-2020年）》，加快推进绿色制造，我部决定开展绿色制造体系建设。现将有关事项通知如下：

一、总体思路

按照党中央、国务院关于生态文明建设的决策部署，牢固树立创新、协调、绿色、开放、共享的发展理念，落实供给侧结构性改革

建设内容 Content of establishment

程序安排 Schedules

保障措施 Safeguard measures

绿色产品、绿色工厂、绿色园区、绿色供应链

Green products, green factories, green industrial parks and green supply chains

实施方案确定
Determine
implementation
program

评价创建效果
Assess
effects

确定示范名单
Determinate
demonstration
list

地方评估确认
Identify
local
evaluation

加强监督管理
Enhance
supervision
and
managemen
t

加强组织协调
Strengthen
organization and
coordination

加大支持力度
Improve
support

提升服务能力
Improve
services

建立评价机制
Establish
assessment
mechanism

完善标准体系
Improve
standard
systems

江西省

河南省

关于印发《湖南省

湖南省

广东省经济

关于印发四川省

关于印发《山西省绿色制造体系建设 实施方案》和《山西省绿色制造体系建设 2017 年行动计划》的通知

来源：山西省经信委网站；发布时间：2017-06-06；浏览次数：206 次；【李强：小关】

各市经信委：

为贯彻落实十一次党代会及全省经济工作会议精神，促进山西绿色制造体系建设，根据工信部要求，我委制定了《山西省绿色制造体系建设实施方案》和《山西省绿色制造体系建设2017年行动计划》，现印发给你们，请结合实际，认真组织实施。

附件：1.《山西省绿色制造体系建设实施方案》

2.《山西省绿色制造体系建设2017年行动计划》

山西省经济和信息化委员会

2017年5月19日

公开类型：公开



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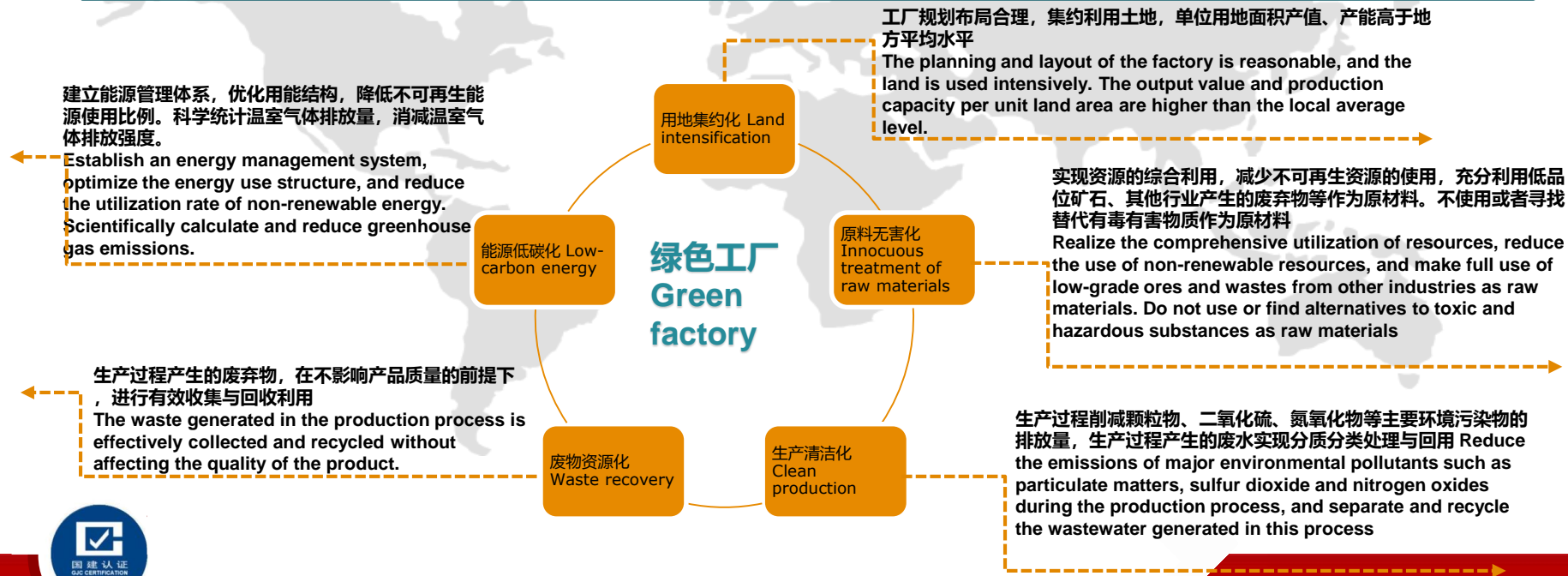
建材行业绿色工厂的创建

Establishment of Green Factories in the Building Materials Industry



工厂是制造业的生产单元，**绿色工厂是绿色制造的实施主体**，属于绿色制造体系的核心支撑单元，侧重于生产过程的绿色化。绿色工厂应实现了用地集约化、原料无害化、生产清洁化、废物资源化、能源低碳化。

A factory is a manufacturing unit of the manufacturing industry. **The green factory is the implementing body of green manufacturing.** It is the core supporting unit of the green manufacturing system and focuses on the environmentally friendly production process. The green factory can achieve land intensification, harmless treatment of raw materials, clean production, waste recovery and low-carbon energy.



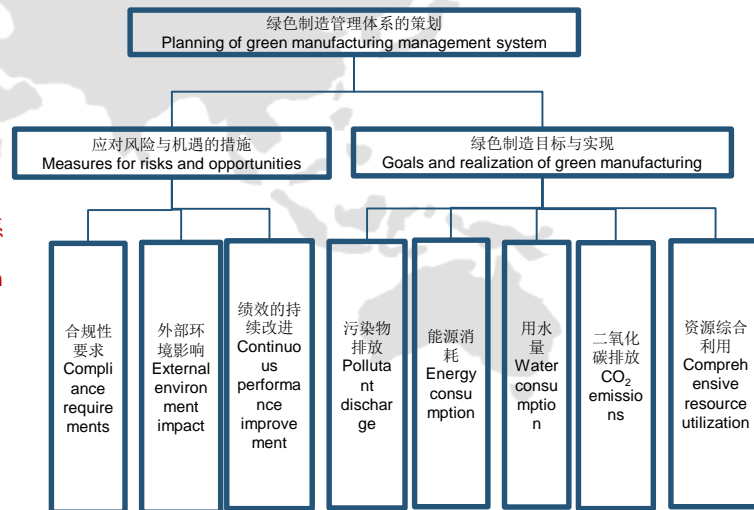
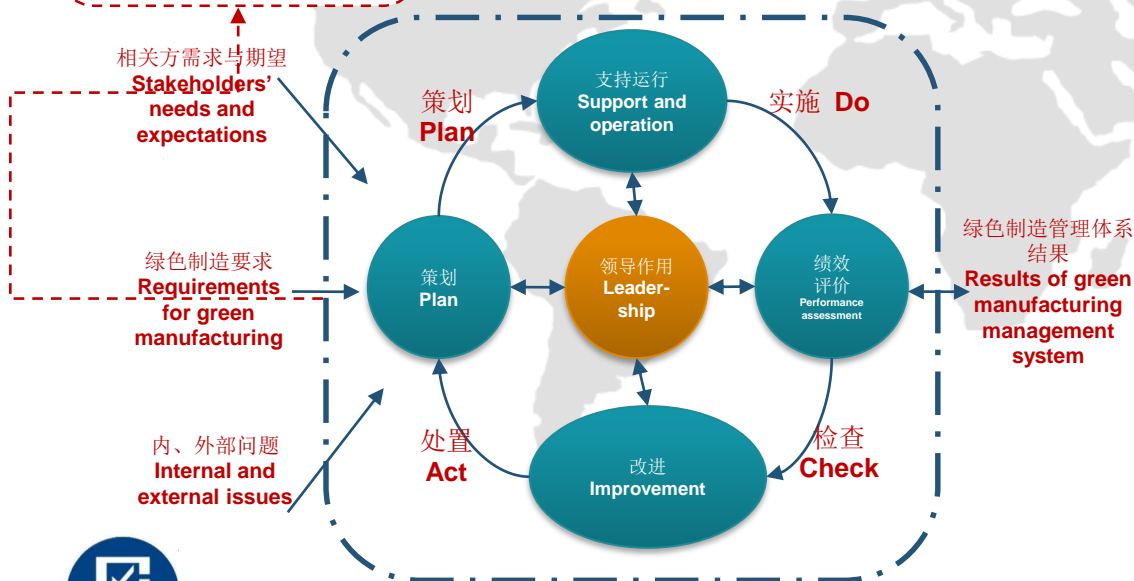
2 绿色工厂的创建内容-管理体系

Content of the Establishment of Green Factory – Management System

- 绿色制造技术 Green manufacturing technology
- 绿色制造工艺 Green manufacturing process
- 绿色生产过程 Green production process
- 能源利用高效低碳 Efficient and low-carbon energy use
- 工业资源综合利用 Comprehensive utilization of industrial resources

遵循策划-实施-检查-处置 (PDCA) 的管理循环, 通过与质量管理体系、环境管理体系、职业健康安全管理体系、能源管理体系等已成熟实施的管理体系模式相结合, 实现管理整合, 保证其可用性与一致性, 降低企业管理成本

Follow the plan-do-check-act (PDCA) management cycle and integrate the green manufacturing management system with established management systems such as quality, environmental and / or energy management as well as occupational health and safety management systems etc., its practical feasibility and consistency should be ensured and enterprises' management costs reduced.



生产过程建材行业重点关注颗粒物、氮氧化物、二氧化硫的排放

The building materials industry focuses on the emissions of particulate matters, sulfur dioxide and nitrogen oxides during the production process.

- 京津冀、长三角、珠三角等重点区域实施大气污染重点行业清洁生产水平提升行动;
- Implementation of clean production activities in key air pollution industries and key areas such as Beijing-Tianjin-Hebei, Yangtze river Delta and Pearl River Delta.
- 重点流域实施水污染重点行业清洁生产水平提升行动
- Implementation of clean production activities in key water pollution industries and watersheds.
- 削减挥发性有机物、持久性有机物、重金属等污染物排放
- Reduction of emissions of volatile organic compounds, persistent organic matter, heavy metals, etc.;

排污许可证 Pollutant Permit

《排污许可证申请与核发技术规范 水泥工业》

“Technical specification for application and issuance of pollutant permit - cement industry “

《排污许可证申请与核发技术规范 陶瓷砖瓦工业》

“Technical specification for application and issuance of pollutant permit – Ceramics, fired brick and tile industry “

《排污许可证申请与核发技术规范 玻璃工业—平板玻璃》

“Technical specification for application and issuance of pollutant permit – flat glass “

特别排放限值
Special
emission
limits

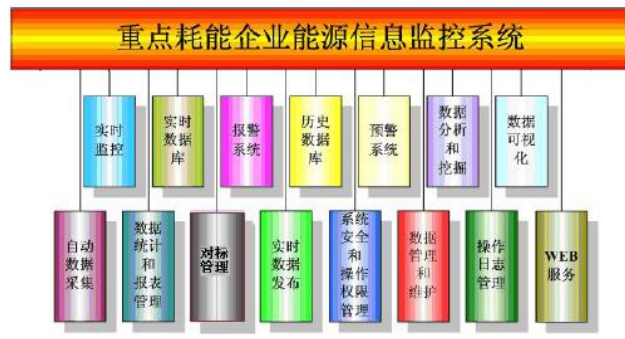
超低排放
Ultra low
emissions



- ◆ 能源计量系统、在线计量、能管中心
- ◆ Energy metering system, online metering, energy management center
- ◆ 清洁能源、可再生能源、清洁电力使用
- ◆ Clean energy, renewable energy, clean electricity usage
- ◆ 替代燃料
- ◆ Alternative fuel
- ◆ 余热发电、余热利用
- ◆ Power generation through waste heat, utilization of waste heat
- ◆ 节能改造、创新工艺、新装备
- ◆ Energy-saving transformation, innovative technologies and new equipment
- ◆ 执行能耗限额标准 Implementation of energy consumption limit standards
- ◆ 能源管理体系认证 Certification for energy management systems



水泥企业 渔光互补光伏



能源管理信息化系统



耐火材料企业 屋顶光伏发电



绿色矿山



金隅集团 飞灰处置生产线



- 建材行业的资源投入侧重于消纳其他行业产生的固体废弃物
- The resources that are used by the building materials industry derive largely from the solid waste generated by other industries.
- 减少或替代有毒有害、稀缺原料使用
- Reduction or replacement of toxic, harmful and rare raw materials.
- 利用工业废弃物、尾矿、废矿等
- Usage of industrial waste, gangue and waste ore, etc.
- 协同处置垃圾、污泥、危废、替代原料
- Collaborative disposal of waste, sludge, hazardous waste and alternative raw materials.
- 提高产成品率，节约资源
- Improve production yield and save resources
- 绿色采购
- Green procurement
- 绿色矿山
- Green mines



混凝土 砂浆再生骨料生产线

2 绿色工厂的创建内容-产品

Content of the Establishment of Green Factory - Products



定义：全生命周期内可减少对天然资源消耗和减轻对生态环境影响。具有“节能、减排、安全、便利和可循环”特征的建材产品。

Definition: The building materials that can reduce natural resource consumption and ecological impact throughout the life cycle and have the characteristics of “energy saving, emission reduction, safety, convenience and recyclability”.

纳入产品门类：砌体材料、保温材料、预拌混凝土、建筑节能玻璃、陶瓷砖、建筑卫生陶瓷、预拌砂浆

Product categories: Masonry materials, insulation materials, ready-mixed concrete, energy-saving building glass, ceramic tiles, building sanitary wares, ready-mixed mortar



定义：在产品原材料获取、生产、使用、废弃等不同环节中资源能源消耗少、污染排放低、环境影响小、对人体健康无害、便于回收再利用的符合产品性能和安全要求的产品。

Definition: Products that meet the product performance and safety requirements in terms of product raw materials' acquisition, production, use and disposal, with the characteristics of low resource and energy consumption, low pollution emissions, low environmental impact, harmless to human health and easy recycling.

纳入建材产品门类：人造板和木质地板、涂料、卫生陶瓷、建筑玻璃、家具、绝热材料、防水与密封材料、陶瓷砖（板）、木塑制品

Product categories: Wood-based panels and wood flooring, coatings, sanitary wares, building glass, furniture, thermal insulation materials, waterproof and sealing materials, ceramic tiles (panels), wood-plastic products



定义：按照全生命周期理念，在产品的设计开发阶段系统考虑原材料选用、生产、销售、使用、回收、处理等各环节对资源环境造成的环境影响，力求产品在全生命周期中最大限度降低资源消耗、尽可能少用或不用含有有毒有害物质的原材料，减少污染物产生和排放。

Definition: According to the whole life cycle concept, in the phase of product design and development, systematically consider the environmental impacts of raw materials' selection, production, sales, use, recycling and disposal on resources and the environment, and strive to minimize the consumption of resources during the whole life cycle, and use less or abandon raw materials containing toxic and hazardous substances to reduce pollutant generation and emissions.

纳入产品门类：卫生陶瓷、水性建筑涂料

Product categories: Sanitary wares, water-borne architectural coatings





3

建材行业绿色工厂的评价

Assessment of Green Factories in the Building Materials Industry



- 绿色工厂的创建主体是企业，企业依据评价标准可以开展自我评价
- The main body in the development of the green factory is enterprises, which can conduct a self-assessment according to the assessment criteria.**
- 参与绿色制造示范工作的企业通过第三方评价对创建工作予以综合评估
- Enterprises participating in green manufacturing demonstration can be comprehensively evaluated through a third-party assessment.**



建材工业 BRECC 节能与绿色发展评价中心

- 国建联信认证中心与中国建筑材料联合会绿色低碳分会、节能减排分会合作组建“建材工业节能与绿色发展评价中心” (BRECC)
- Guojian Lianxin Certification Center jointly established the “Building Resources Evaluation Center”(BRECC) with the low-carbon branch and energy-saving and emission reduction branch of China Building Material Federation;
- 承担建材行业节能与绿色发展的**政策研究宣传、绿色标准制修订及绿色评价**等工作，联系搭建国家层面政策导向及企业层面贯彻落实的桥梁。
- Undertake **policy research and publicity, green standard revision and green assessment** for energy conservation and green development of the building materials industry, and facilitate the implementation of national policies at enterprise level.



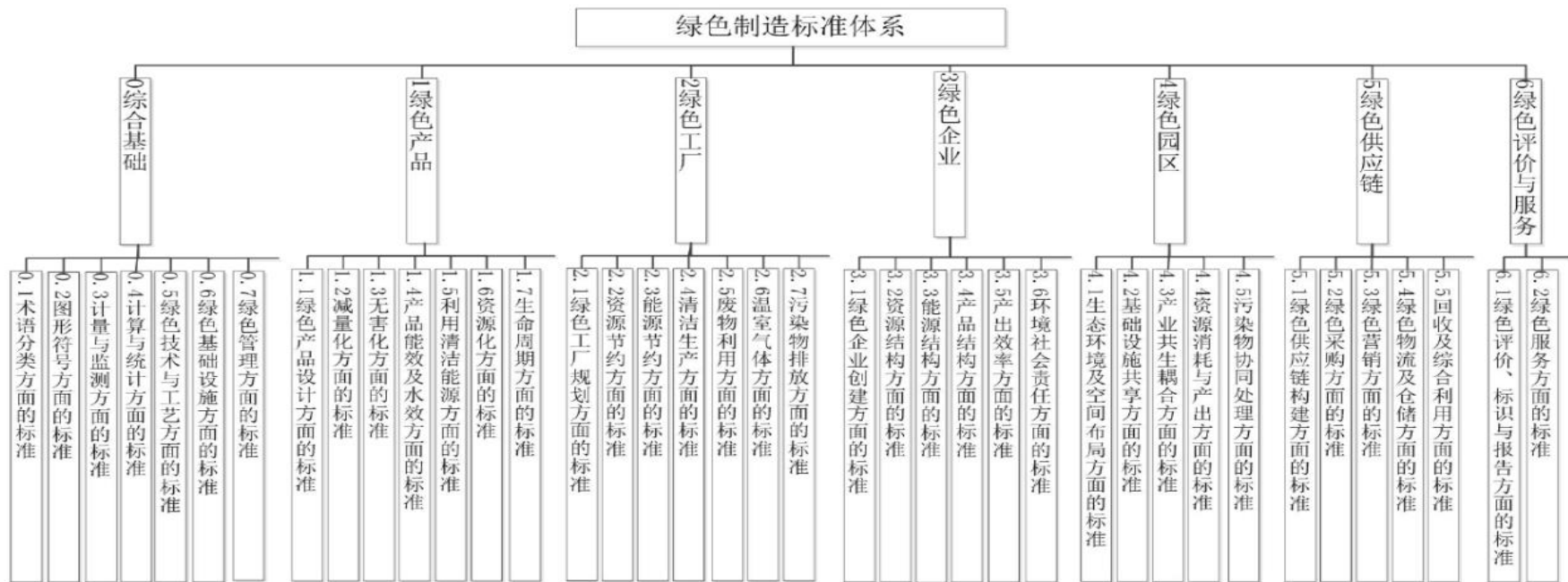


图 2 绿色制造标准体系框架

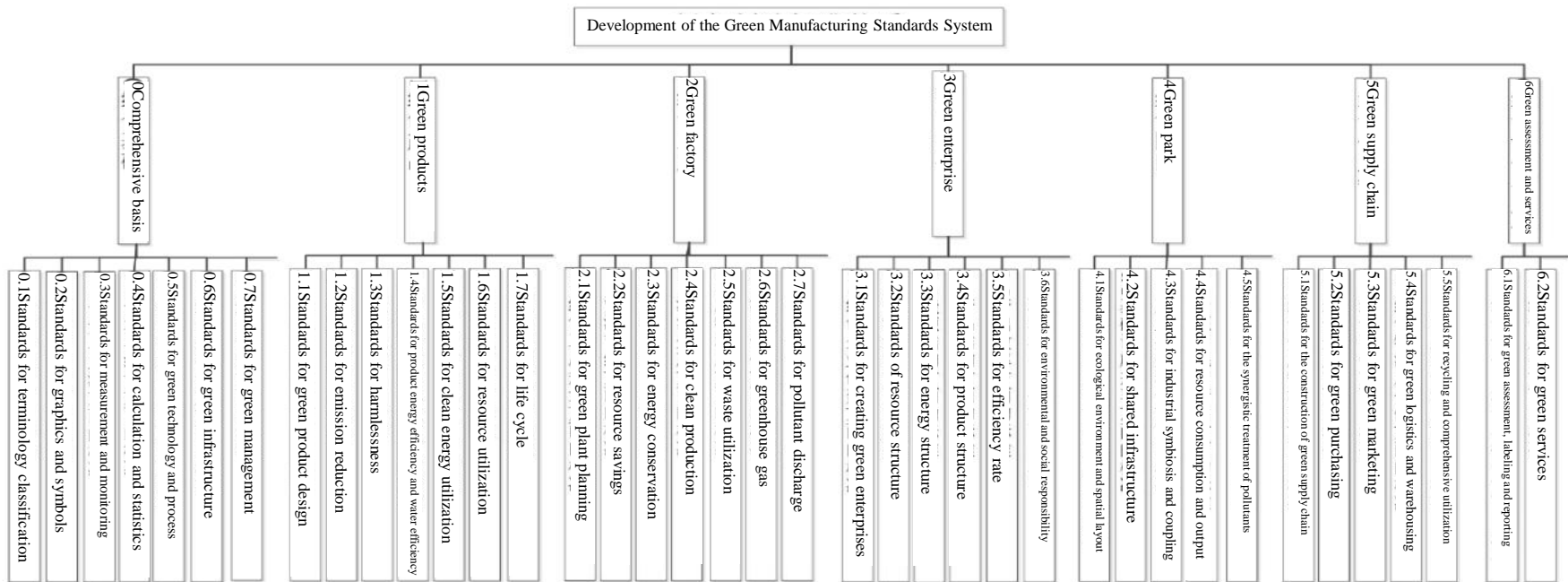


Figure 2 Framework of the green manufacturing standards system

3 建材行业绿色工厂评价标准的制定

Development of the Green Factory Assessment Standards in the Building Materials Industry

工业和信息化部办公厅文件

工信厅科〔2017〕40号

工业和信息化部办公厅关于印发
2017年第一批行业标准制修订计划的通知

有关
制
定
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工业和信息化部办公厅文件

工信厅科〔2018〕54号

工业和信息化部办公厅关于印发2018年
第三批行业标准制修订和外文版项目计划的通知

有关单位：

根据工业和信息化部标准制修订工作的总体安排，我部编制完成了2018年第三批行业标准制修订和外文版项目计划。现印发给你们，请认真组织实施。具体要求如下：

- 一、标准起草单位要注意做好标准制定与技术创新、试验验证、知识产权处置、产业化推进、新技术应用推广的统筹协调。
- 二、标准化技术归口单位、技术组织、有关行业协会（联合会）、集团公司（企业）等主办单位要尽早安排，将文件及时转

— 1 —

绿色工厂评价通则（GB/T36132-2018） General Assessment Principles for Green Factory (GB/T36132-2018)

提纲挈领
Outline

水泥行业绿色工厂评价通则
Assessment Guidelines for Green Factory in the Cement Industry

建筑陶瓷行业绿色工厂评价通则
Assessment Guidelines for Green Factory in the Architectural Ceramics Industry

玻璃行业绿色工厂评价通则
Assessment Guidelines for Green Factory in the Glass Industry

卫生陶瓷行业绿色工厂评价通则
Assessment Guidelines for Green Factory in the Sanitary Wares Industry

水泥制品行业绿色工厂评价通则
Assessment Guidelines for Green Factory in the Cement Product Industry

耐火材料行业绿色工厂评价通则
Assessment Guidelines for Green Factory in the Refractory Materials Industry

引领行业
Industry
guidance

水泥行业绿色工厂评价要求
Assessment Requirements for Green Factory in the Cement Industry

建筑陶瓷行业绿色工厂评价要求
Assessment Requirements for Green Factory in the Architectural Ceramics Industry

玻璃行业绿色工厂评价要求
Assessment Requirements for Green Factory in the Glass Industry

卫生陶瓷行业绿色工厂评价要求
Assessment Requirements for Green Factory in the Architectural Ceramics Industry

指导企业
Enterprise
guidance



- 水泥、玻璃、陶瓷等四项绿色工厂评价导则行业标准目前均已编制完成，即将进行审议。配套评价要求（细则）行业标准已经完成立项。
- The industry standards for the assessment guidelines of green factories in four industries including cement, glass and ceramics have been completed and will be reviewed. The supporting industry standards for assessment requirements (specifications) have been completed.
- 水泥制品、耐火材料、墙体材料等行业评价导则目前已经立项
- Industry assessment guidelines for cement products, refractory materials, wall materials, etc. have been established.



《水泥行业绿色工厂评价导则》标准研讨会
Standards workshop on the Assessment Guidelines for Green Factories in the Cement Industry



《玻璃行业绿色工厂评价导则》标准研讨会
Standards workshop on the Assessment Guidelines for Green Factories in Glass Industry

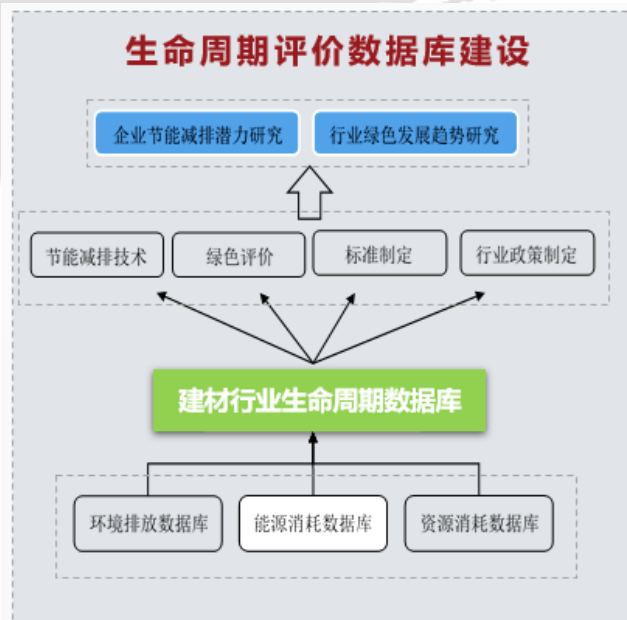


建筑陶瓷、卫生陶瓷行业绿色工厂评价导则标准启动会 Kick-off meeting on the Assessment Guidelines for Green Factories in the Architectural Ceramics and Sanitary Wares Industry



- 全面系统的规定能源、环境、资源、温室气体等量化指标，为企业推进生命周期绿色管理工作提供抓手；
Define comprehensive and systematic quantitative indicators such as energy, environment, resources and greenhouse gases to help enterprises to promote the green management of their life cycle;
- 有效引导企业走生产清洁化、能源低碳化的绿色发展道路；
Effectively guide enterprises to put green development measures including clean production and low-carbon energy in place;
- 规范现有绿色工厂的创建工作持续满足要求；
Standardize the development of existing green factories to meet the requirements continuously;
- 保持企业、机构在创建及评价过程中理解一致。
Keep enterprises and organizations consistent in their development and assessment process.

以生命周期评价（LCA）理论为指导，系统建立建材行业能源、资源、环境排放数据库，支撑绿色评价
With life cycle assessment (LCA) theory as the guideline, systematically establish a database of energy, resources and environmental emissions of the building materials industry and support green assessment.



用地集约化 Land
intensification

容积率、建筑密度、单位用地面积产值/产能
Floor area ratio, building density, unit area production value/capacity

原料无害化 Harmless
treatment of raw
materials

绿色物料使用率
Utilization rate of green materials

生产清洁化 Clean
production

单位产品污染物产生量、废气产生量、废水产生量
Pollutant production, waste gas production and wastewater production per unit product

废物资源化 Waste
recovery

单位产品主要原材料消耗量、固体废物综合利用率、废水回用率 Consumption of main raw materials, the comprehensive utilization rate of solid waste and the wastewater reuse rate per unit product

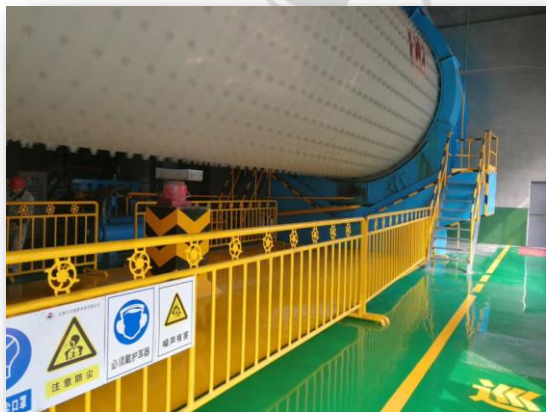
能源低碳化 Low-
carbon energy

单位产品综合能耗、碳排放量
Comprehensive energy consumption and carbon emissions per unit product

- 2017年至今，国家工信部共推荐绿色制造示范名单三批；
- Since 2017, Ministry of Industry and Information Technology (MIIT) has recommended lists of three batches of green manufacturing entities;
- 绿色工厂示范评价依据《关于开展绿色制造体系建设的通知》（工信厅节函[2016]586号），以及《绿色工厂评价通则》（GB/T 36132-2018）
- The green factory demonstration is assessed based on the Notice on Building Green Manufacturing Systems (GONG XIN TING JIE HAN [2016] No. 586) and the General Assessment Principles for Green Factory (GB/T 36132-2018)
- 目前已公布了两批绿色国家级绿色制造名单：包括**400**多家绿色工厂、**200**多个绿色设计产品、近**50**个绿色园区和近**20**个绿色供应链；
- The lists of two batches of national green manufacturing entities have been announced, which include more than **400** green factories, more than **200** products with green design, nearly **50** green parks and nearly **20** green supply chains;
- 根据各省、市绿色制造方案，部分省份开展了省级绿色工厂的推荐与示范。
- According to various provincial and municipal green manufacturing programs, some provinces have carried out the recommendation and demonstration of provincial green factories.



- 建材行业目前已有近50家企业入选绿色工厂示范名单，涵盖水泥、玻璃、陶瓷、家具、防水、耐火等领域
- Nearly 50 enterprises in the building materials industry have been selected in the green factory demonstration list, covering cement, glass, ceramics, furniture, waterproof, fireproof and other fields.



■ 第一批绿色工厂颁证仪式

Certification ceremony of the first batch of green factories



■ 第一批绿色工厂颁证仪式

Certification ceremony of the second batch of green factories

结语 Conclusion

绿色技术、装备创新、资源能源高效利用、持续降低污染物及温室气体排放、产品高质绿色耐久

Green technology, equipment innovation, efficient use of resources and energy, continuous reduction of pollutants and greenhouse gas emissions, high-quality, green and durable products



通过绿色标准、建立集资源、能源、环境、安全、职业卫生为一体的绿色管理体系，将绿色管理贯穿于企业研发、设计、采购、生产、营销、服务等全过程，实现生产经营管理全过程绿色化

Establish a green management system that integrates resources, energy, environment, safety and occupational health according to green standards, put green management in place throughout enterprises' R&D, design, procurement, production, marketing and service, and realize the green production and operation management

开展绿色企业文化建设，与上下游共同构建绿色供应链，提升品牌竞争力。明确绿色发展是企业提质增效的重要途径，更是企业应当承担的社会责任

Develop the green corporate culture, build a green supply chain together with upstream and downstream factories, and enhance brand competitiveness. Define that green development is an important way for enterprises to improve quality and efficiency, and it is also the social responsibility that enterprises must undertake.



谢谢 Thank you!

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中国建筑材料联合会
绿色低碳建材分会



国建联信认证中心
Guojian Lianxin Certification Center

