

BDAE CONSULTING

上海倍蒂建筑工程咨询有限公司

LEED 咨询服务介绍

LEED INTRODUCTION

中文版 // PAGE 1

ENGLISH VERSION // PAGE 34



BD ADVANCED ENGINEERING CONSULTING CO., LTD.

上海倍蒂建筑工程咨询有限公司

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绿色建筑需求

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绿色建筑的好处

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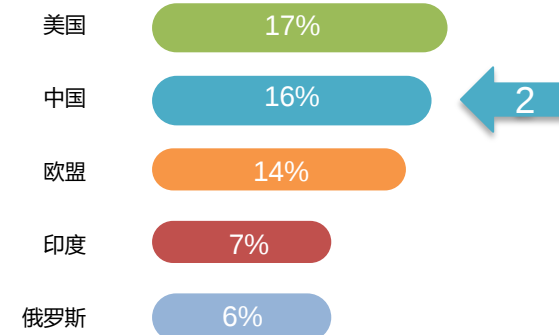
案例分析

05

碳管理业务



各国建筑能耗比:



温室气体排放 21%



能源消耗 50%



建筑相关污染 50%



垃圾产生50%

建筑现状

行业走势

全国建筑能耗平均5.6%/年上涨（10年）

工业园区碳排放占比全国31%

15%平米建筑能效（2015）

绿色建材使用达到40%（2020）

绿色建筑达到50%（2020）

城镇化2019年达到60%，距离2030年达到

80%还有很大空间

- 中国承诺2030年碳排放到达峰值，然后逐年下降
- 国家节能减排政策要求
- 绿色建筑成为强制规范

- 国家和地方政策支持
- 财务支持，奖励
- 税收减免

- 总部强制要求
- 社会责任
- 企业形象
- 节省费用的驱动
- 住户自身要求



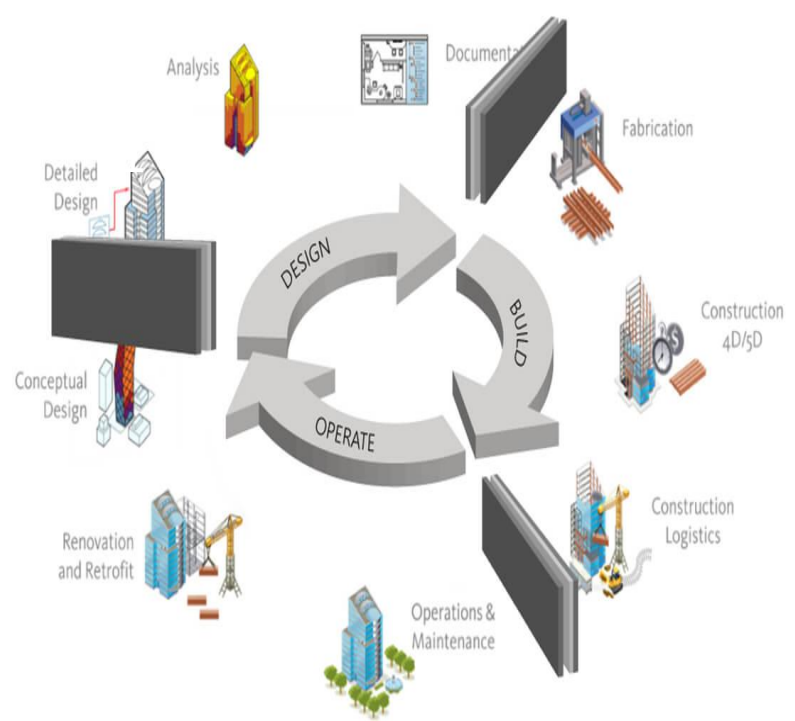
国家要求



政策引导



企业自身要求



1

节约资源

2

环境友好

3

舒适环境

4

经济利益

1

- ▢ 节地
- ▢ 节水
- ▢ 节能
- ▢ 节材

2

- ▢ 减少废弃物产生
- ▢ 减少新资源开采
- ▢ 减少环境污染
- ▢ 增加生物多样性

3

- ▢ 便利社区设施
- ▢ 便利交通
- ▢ 优质空气品质
- ▢ 健康居住环境

4

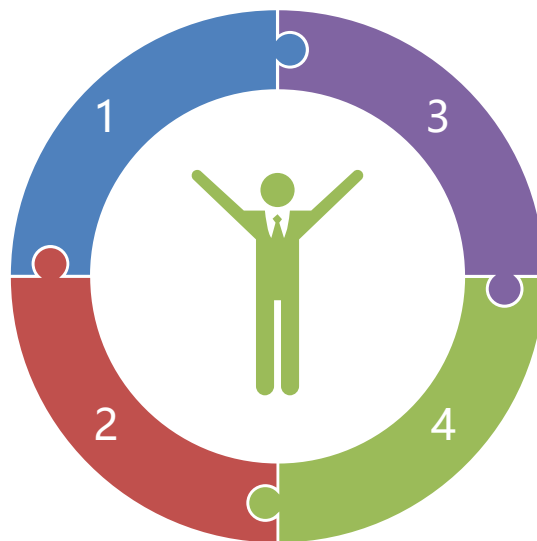
- ▢ 减少账单费用
- ▢ 减少运营维护
- ▢ 减少缺勤率

节省费用

\$1.2B	能源
\$149.5M	水
\$715.3M	运营维护
\$54.2 M	垃圾制造

健康好处

健康的员工,健康的住户
减少缺勤率
减少室内空气污染



经济好处

运营维护费用节省 13.6%
物业价值增值 10.9%
投资回报率增加 9.9%
入住率提高 6.4%
租金增长 6.1%

环境好处

34% 减少CO2排放
25% 减少能源消耗
11% 减少水的使用
80M tons 减少垃圾处置
1.3M tons/Y 节省煤的使用
78M tons/Y 减少CO2排放

注：数字取自USGBC官网2015-2018

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绿色建筑体现简介
LEED简介
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LEED对投资影响
BDAE的角色
LEED成果

03

LEED绿色措施

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碳管理业务

全世界绿色认证体系



中国 绿标



美国 LEED



英国 BREEAM



日本 CASBEE



德国 DGNB



法国 HQE



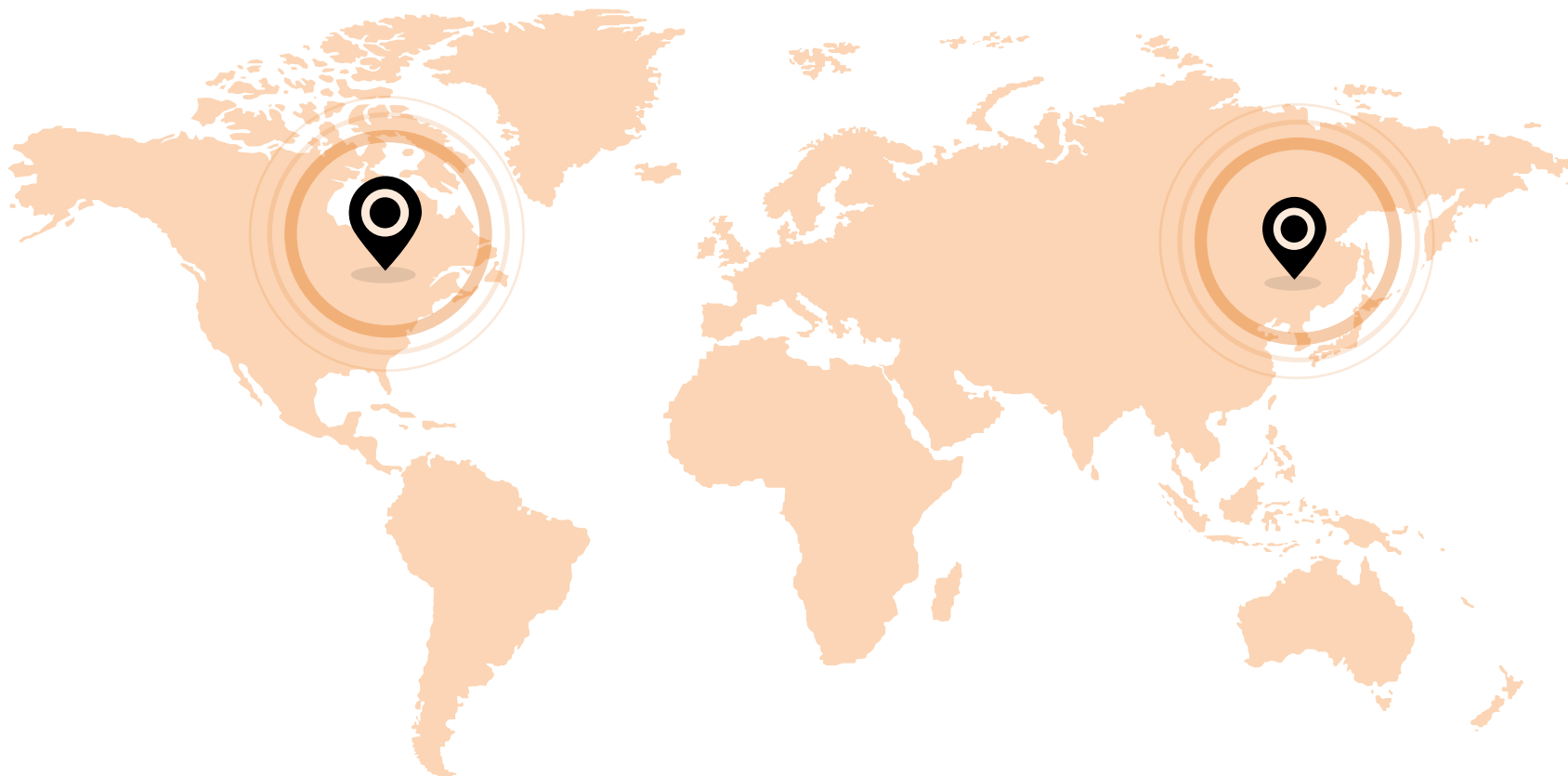
南非 SBAT



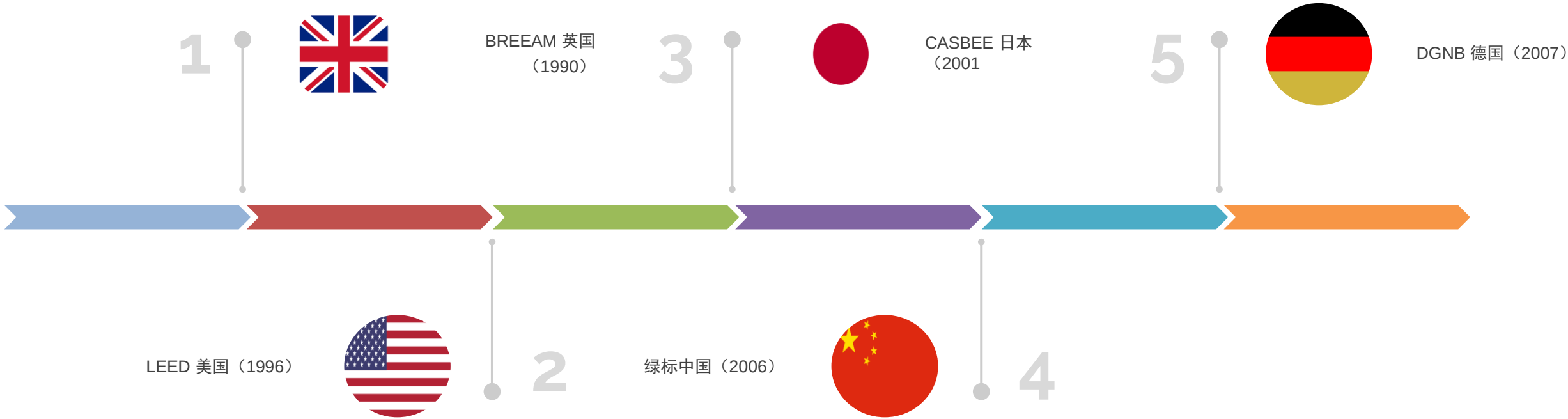
丹麦 E-Top



挪威 EKO PROFILE



主要绿色认证体系发展





新建建筑
设计与施工

室内设计
与施工

既有建筑
运行与维护

社区开发

住宅



通过
40-49 分
8+ 项目



银奖
50-59 分
15+ 项目



金奖
60-79 分
30+ 项目



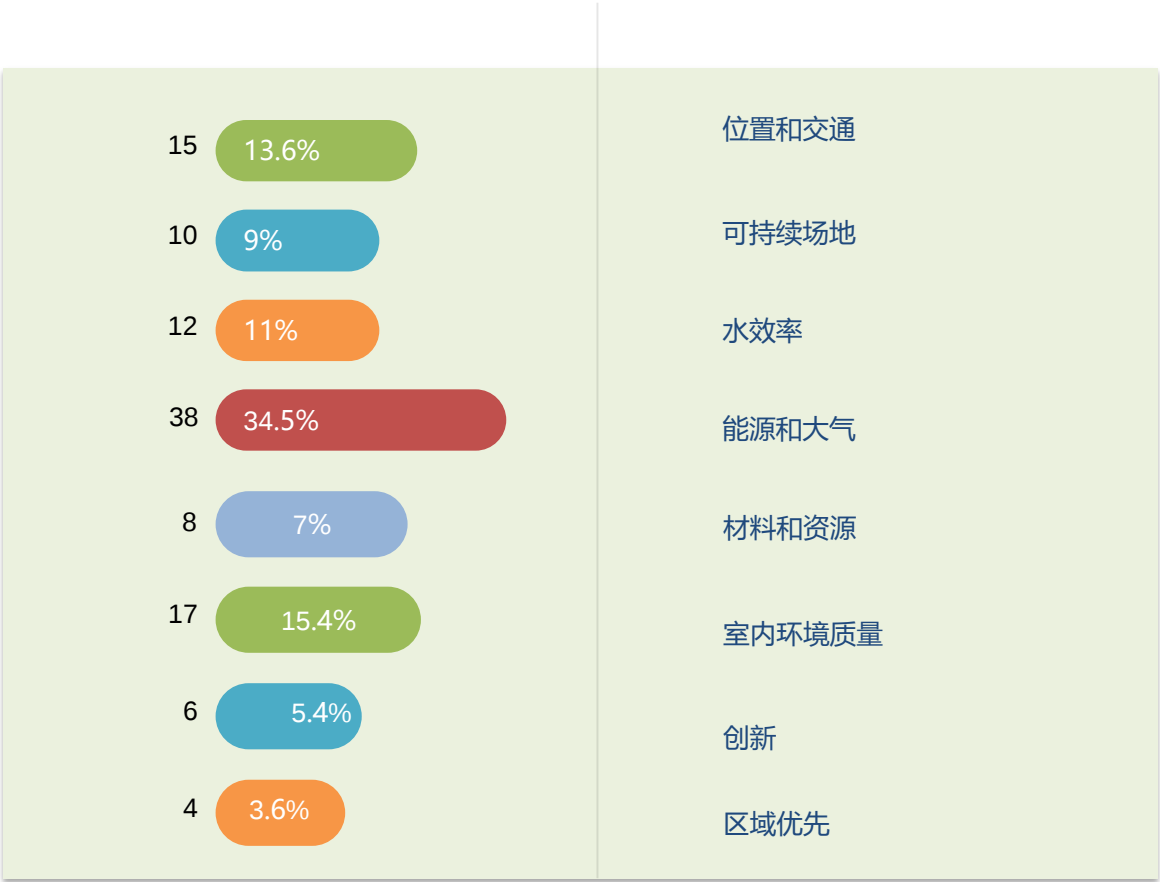
白金
80+ 分
8+ 项目

LEED 简介

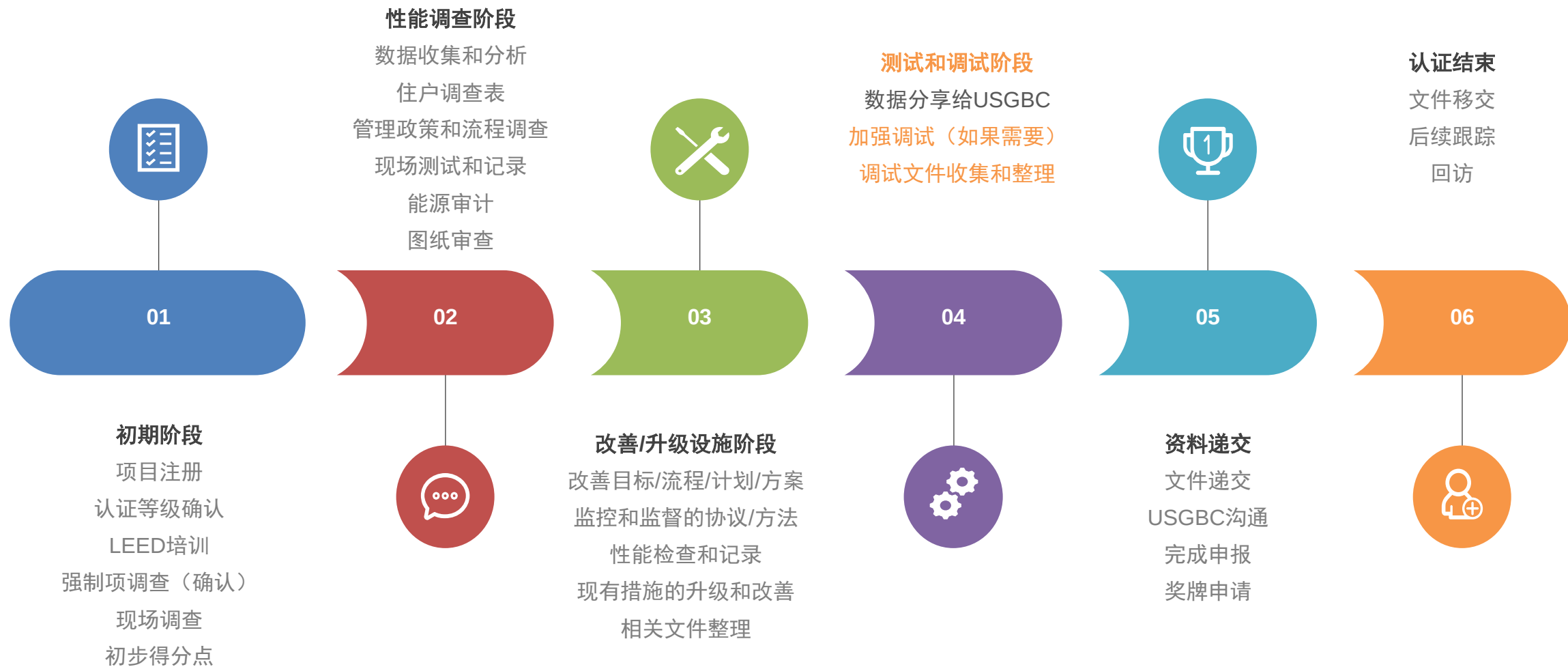
- ◆ LEED (能源和环境设计先锋) V4.1;
- ◆ USGBC 通过LEED致力于可持续以及未来的发展;
- ◆ LEED是世界上认知最高应用最广的认证系统;
- ◆ 世界上超过124,000 认证项目, 8399白金项目, 23308金奖项目;
- ◆ 中国超过4180认证项目, 216白金项目, 1014金奖项目;
- ◆ 中国是除了美国本土以外排名第一的国家;



V4.1 O&M 为例，总分110分



O+M认证流程



初始投资增加

0-2%

不包含工艺设备

- 节能：5% - 7%
- 节水：>20%
- 减少垃圾产生：
>30%



通过奖

初始投资增加

1-3%

不包含工艺设备

- 节能：6% - 9%
- 节水：>30%
- 减少垃圾产生：>
40%



银奖

初始投资增加

3-8%

不包含工艺设备

- 节能：8% - 12%
- 节水：>35%
- 减少垃圾产生：
>50%



金奖

初始投资增加

>10%

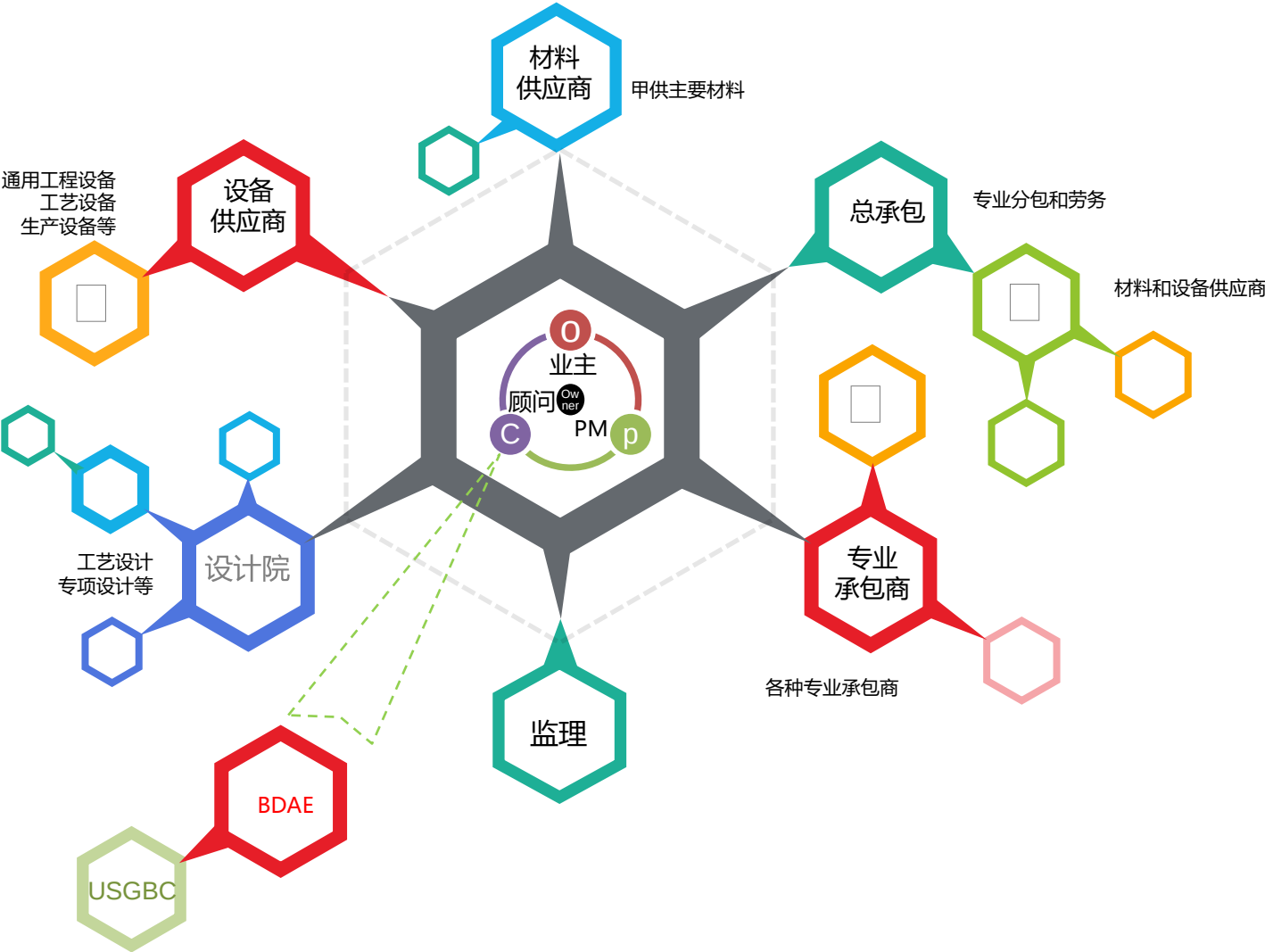
不包含工艺设备

- 节能：>12%
- 节水：>40%
- 减少垃圾产生：
>60%



白金奖

1. 参照 ASHRAE 90.1-2010 标准
2. 参照 EPA ct 1992 标准
3. 新建和改造建筑满足国家和当地的基本要求
4. 参考本公司项目信息



服务周期
工期+6月

现场服务频率：每月一次

涉及到专业工程师：6+.



LEED 证书

该项目获得认证



LEED 奖牌
Group/project 模式

悬挂代表该园区或建筑
获得认证



LEED 贴纸

贴于建筑内部，代表该
建筑获得认证



LEED 制造标识
工厂项目可用

代表某产品在LEED认证的
工厂生产制造

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LEED绿色措施

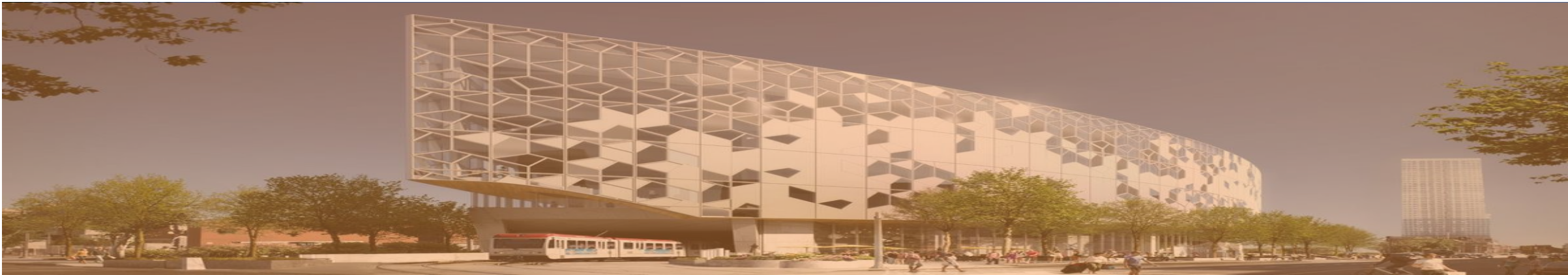
选址与交通
可持续场地
水效率
能源与大气
材料与资源
室内空气质量

04

案例分析

05

碳管理业务



LEED邻里开发场地



敏感土地保护



高度优先场地



周围建筑密度
和多样用途



高效交通



自行车设施

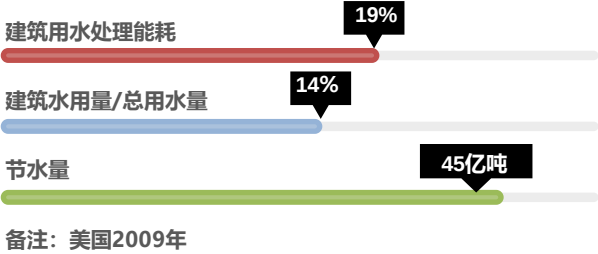


减少停车位



绿色交通工具





通过节水手段，减少地表水的使用
从而减少处理废水的能源和公共基础设施的投入

用水效率

减少地表水的使用



减少室外用水
减少室外绿化用水和室外径流量



减少室内用水
减少室内卫生洁具用水

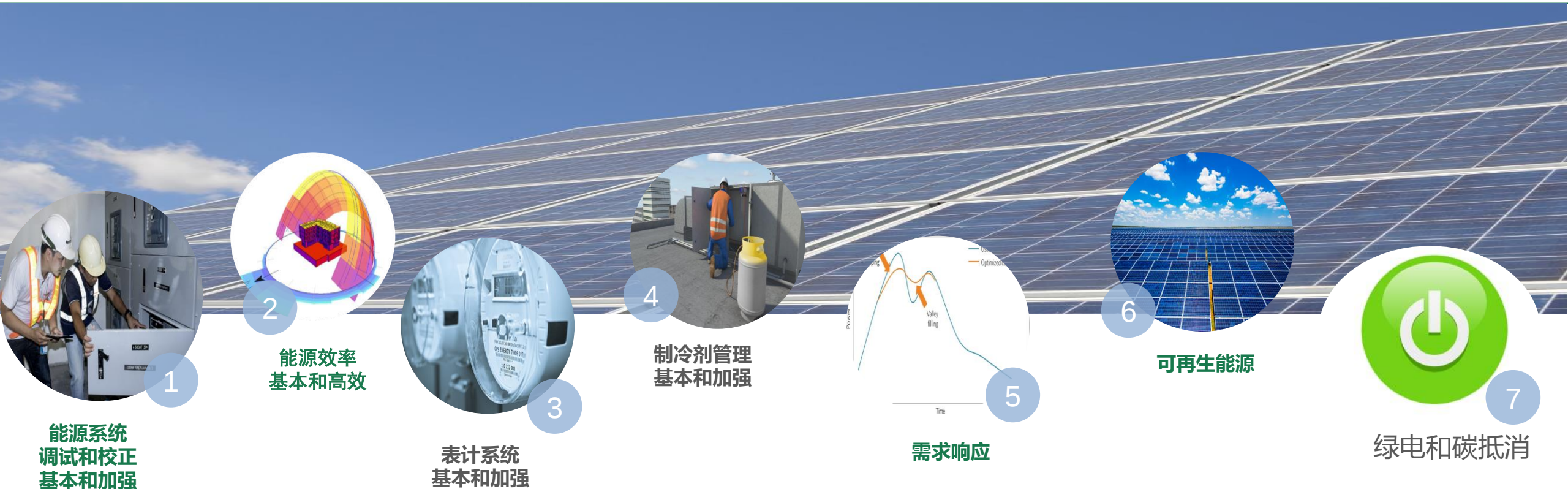


表计系统
完善水计量系统，了解
用水量以及用水系统



冷却塔用水
减少冷却塔用水

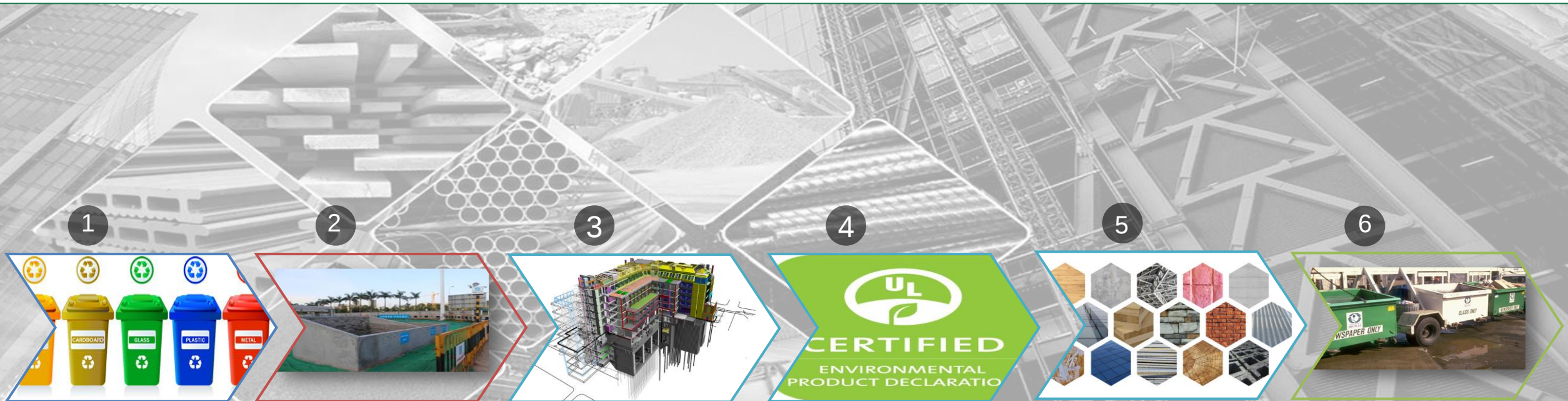




通过有保障的节能手段，提高用能设备效率和推进可再生能源使用
从而减少能源账单和需求，以及能源基础设施的投入



MR 材料和资源



可回收材料的收
集和储藏

施工废弃物
管理计划

减少建筑物
生命周期影响

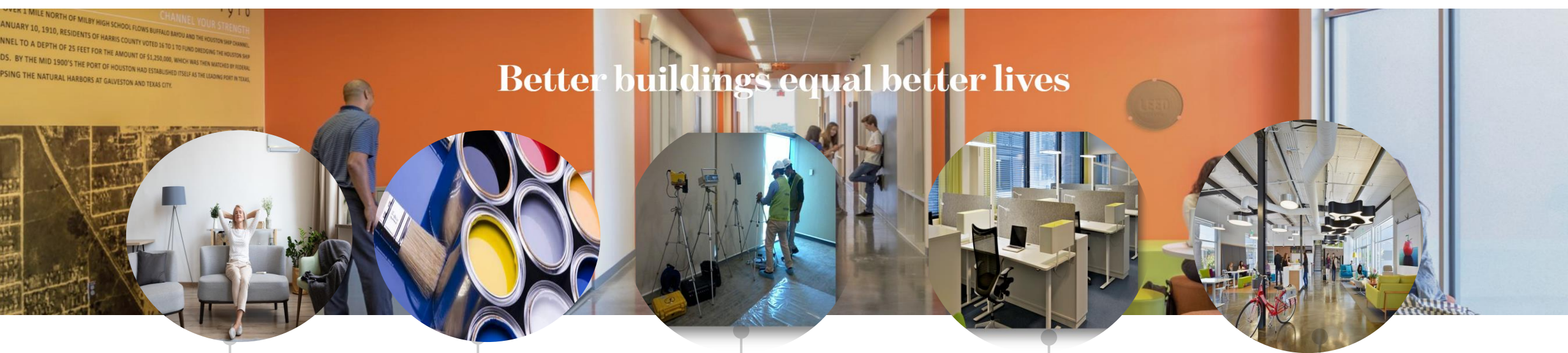
建筑材料公开和优化
环保产品声明

建筑材料公开和优化
原材料来源及材料成分

施工废弃物管理

在建筑的整个生命周期内，通过提高可回收材料和利旧材料的使用
从而减少对原材料的需求，能最小化减少生产、运输、存储这些材料所需要的能源以及环境影响等





Better buildings equal better lives

室内空气质量性能
最小和优化

低排放材料

室内空气质量评估

室内照明

高品质视角



控烟环境

施工室内空气质量

热舒适性

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声学性能



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绿色措施
工期影响
费用影响

05

碳管理业务

得分表



LEED v4.1 for Operations & Maintenance: Existing Buildings
Scorecard

Project name: Libao Plaza

Y	?	N			
14	0	0	Location and Transportation	14	
14			Prereq Transportation Performance	14	
0	2	2	Sustainable Sites	4	
		1	Credit Rainwater Management	1	
		1	Credit Heat Island Reduction	1	
	1		Credit Light Pollution Reduction	1	
	1		Credit Site Management	1	
12	3	0	Water Efficiency	15	
12	3		Prereq Water Performance	15	
31	3	1	Energy and Atmosphere	35	
Y			Prereq Energy Efficiency Best Management Practices	Required	
Y			Prereq Fundamental Refrigerant Management	Required	
30	3		Prereq Energy Performance	33	
1			Credit Enhanced Refrigerant Management	1	
		1	Credit Grid Harmonization	1	
8	1	0	Materials and Resources	9	
Y			Prereq Purchasing Policy	Required	
Y			Prereq Facility Maintenance and Renovations Policy	Required	
7	1		Prereq Waste Performance	8	
1			Credit Purchasing	1	
20	2	0	Indoor Environmental Quality	22	
Y			Prereq Minimum Indoor Air Quality	Required	
Y			Prereq Environmental Tobacco Smoke Control	Required	
Y			Prereq Green Cleaning Policy	Required	
18	2		Prereq Indoor Environmental Quality Performance	20	
1			Credit Green Cleaning	1	
1			Credit Integrated Pest Management	1	
0	1	0	Innovation	1	
0	1		Credit Innovation	1	
85	12	3	TOTALS	Possible Points: 100	

Certified: 40-49 points, Silver: 50-59 points, Gold: 60-79 points,
Platinum: 80+ points

最初目标:
69分



实现目标:
85分



➤	交通性能调查	¥ 20,000
➤	能源审计报告LEVEL-1	¥ 30,000
➤	室内空气质量检测	¥ 200,000
➤	绿色清洁	¥ 10,000
➤	增加水表	已有
➤	绿色采购	现有
➤	F7中效空气过滤器	现有
➤	合计	¥ 260,000



上海力宝广场
LEED O+M 白金奖

绿色主要措施



- 位置和交通
- 员工交通调查表



- 能源和效率：
 - ✓ 能源审计 LEVEL-1
 - ✓ 基本/加强制冷剂管理
 - ✓ 能源效率评估
 - ✓ 并网响应



- 材料和资源
- 采购政策
- 设施维护和改造管理
- 废弃物性能
- 采购

- 水效率
- 节水性能计算



- 室内空气质量
- 最低室内空气质量
- 控烟环境和高效过滤器
- 绿色清洁政策
- 室内空气质量性能
- 绿色清洁
- 综合虫害管理

社会经济效益



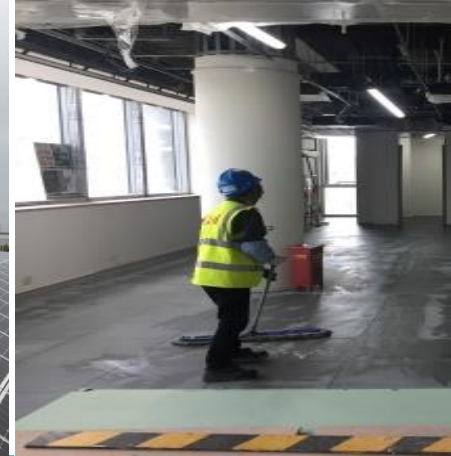
- ☛ 废弃物减少95%
- ☛ 年用水量节省40%
- ☛ 年能耗节省50% (含太阳能)
- ☛ 碳排放减少500吨/年
- ☛ 改善室内环境质量，提高员工的满意度
- ☛ 减少建筑运营及维护的成本



LEED对项目的影



3个月获得证书



室内空气质量需要聘请第三方

不影响运营



绿色措施费用
增加很少



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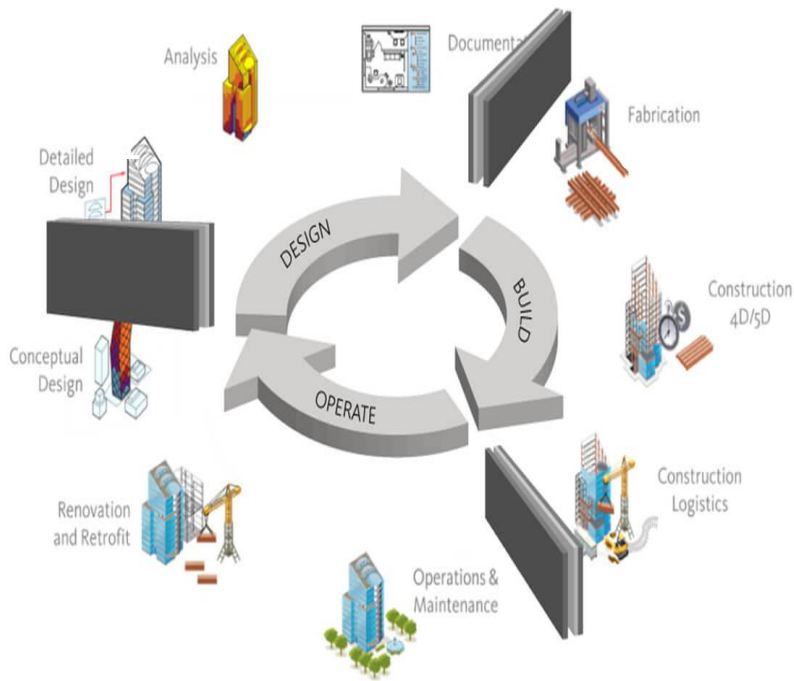
LEED绿色措施

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案例分析

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碳管理业务



1

绿色建筑咨询

2

碳中和

3

能源方案

4

可持续能源

- 1
 - ▮ LEED
 - ▮ WELL
 - ▮ 中国绿建
- 2
 - ▮ 碳中和认证
 - ▮ 碳足迹/排放评估
 - ▮ 碳交易
 - ▮ 碳减排方案
- 3
 - ▮ 能源顾问
 - ▮ 节能措施
 - ▮ 能源调试
 - ▮ 合同能源管理
- 4
 - ▮ 施工总承包
 - ▮ PPA(供电协议)
 - ▮ 可再生能源咨询

LEED 咨询-部分项目成绩



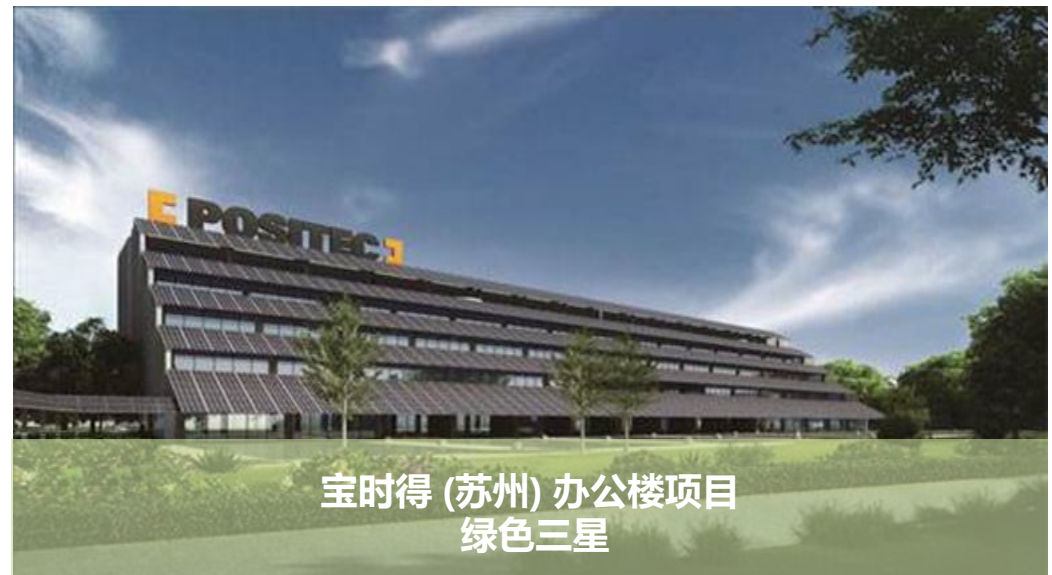
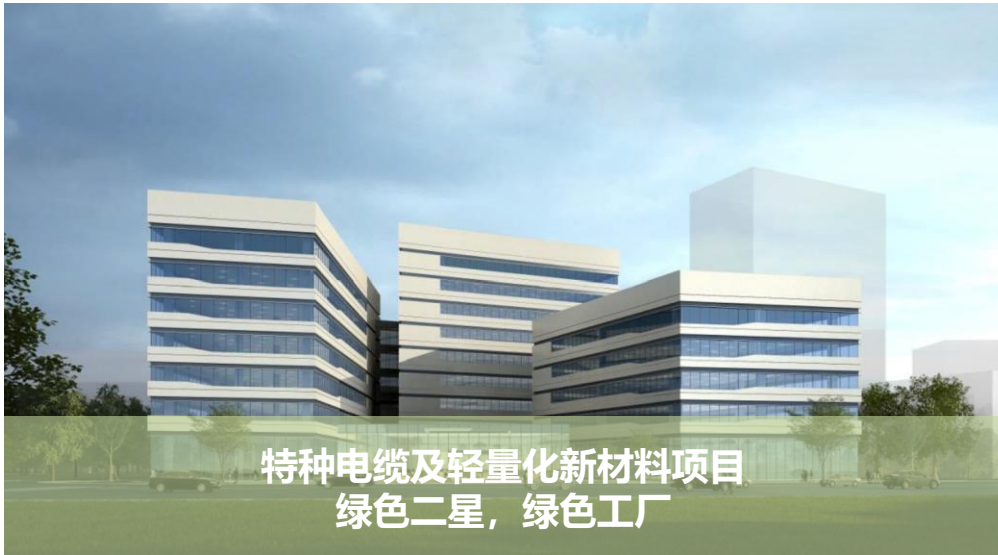
通过等级



银奖



LEED 咨询-部分项目成绩



CONTACT US

Phone +86 021 3417 2901

Mail info@bd-ae.com

Web www.bd-ae.com

Add Tower 7-506, Lotus International Plaza
Lane 7866, Humin Road, Shanghai, P.R.C



BDAEwechat



BDAECONSULTING



BDAE CONSULTING

LEED INTRODUCTION



BD ADVANCED ENGINEERING CONSULTING CO., LTD.

上海倍蒂建筑工程咨询有限公司

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Green Construction Demand

Current situation of national construction energy consumption
Demand of green construction
Concept of green construction concept
Advantage of green construction

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LEED Green measure

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Case Analysis

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Carbon Neutral Service

Current Situation of National Construction



Greenhouse gas emission 21%



Energy consumption 50%



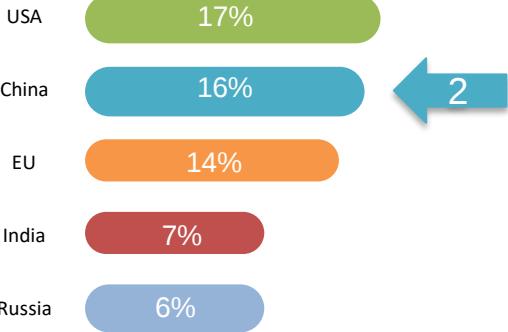
Construction related pollution 50%



Rubbish production 50%

Construction Situation

Construction energy consumption ratio by Countries:



Industry tendency

The average increased ratio of national construction energy consumption is 5.6% per year (10 years)

The industrial estate carbon emission account for 31% of the National carbon emission

Per square meter construction energy reach 15% efficiency (2015)

The usage ratio of green construction material reach 40% (2020)

The green construction account for 50% (2020)

Urbanization account for 60% in 2019, there is still a huge room to reach 80% by 2030

Demand of Green Construction

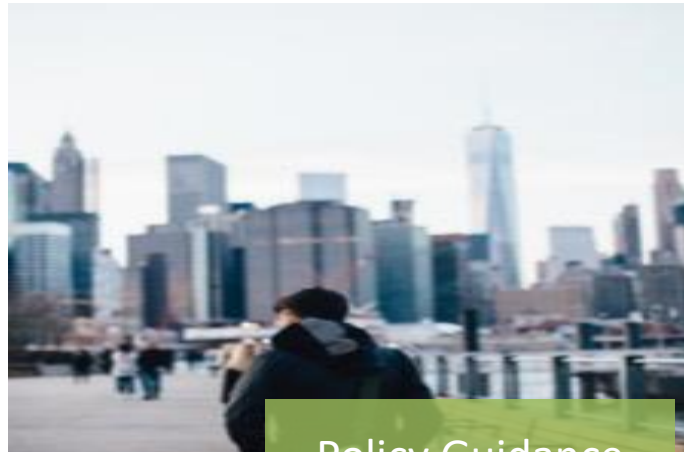
- China Govt. promise that the carbon emission will reach the peak in 2030, then decline year by year
- The policy demands of national energy conservation and emission reduction
- Green construction becomes to the mandatory regulation

- National and local policy support
- Financial support, rewards
- Tax reduction and exemption

- Mandatory demand by Head office
- Social responsibility
- Enterprise image
- Motive for cost saving
- Self-demand of resident



National Demand

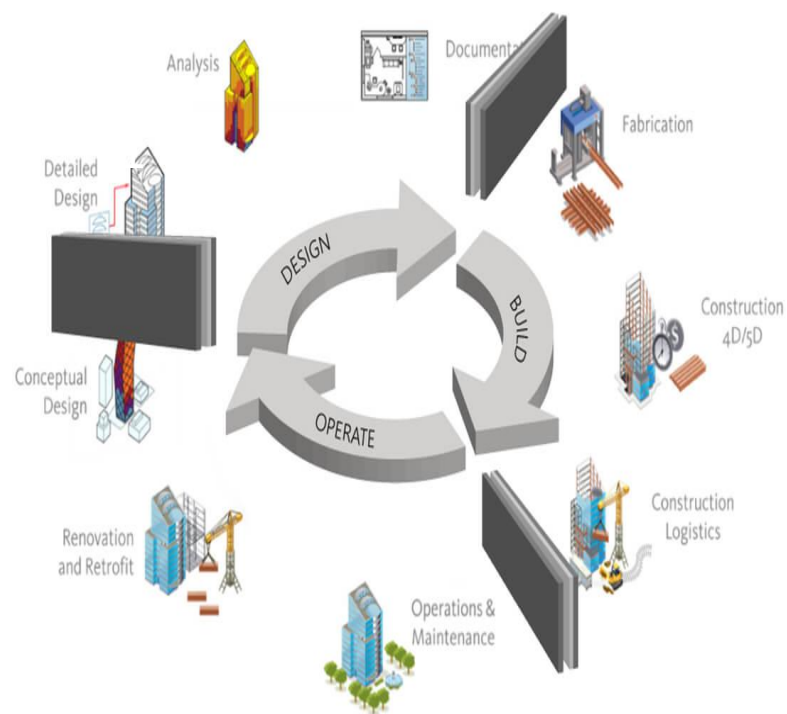


Policy Guidance



Enterprise self-demand

Concept of Green Construction



1

Saving Resources

2

Friendly Environment

3

Comfortable Environment

4

Economic Benefit

1

- ▢ Land saving
- ▢ Water saving
- ▢ Energy saving
- ▢ Material saving

2

- ▢ Reduce rubbish production of
- ▢ Reduce mining new resources
- ▢ Reduce environmental pollution
- ▢ Increase biodiversity

3

- ▢ Facilitate community facility
- ▢ Facilitate traffic
- ▢ Improve air quality
- ▢ Healthy living environment

4

- ▢ Reduce bill cost
- ▢ Reduce operation maintain
- ▢ Reduce absence rate

Advantage of Green Construction

Cost Saving

\$1.2B	Energy
\$149.5M	Water
\$715.3M	Operation maintain
\$54.2 M	Rubbish production

Health Benefit

Health employee, health resident

Reduce absence rate

Reduce indoor air pollution



Economic Benefit

Operation maintain cost saving 13.6%

Real estate value increasing 10.9%

Rate of return on investment increasing 9.9%

Occupancy rate increasing 6.4%

Rental increasing 6.1%

Environment Benefit

34% Reduce CO2 emission

25% Reduce energy consumption

11% Reduce water usage

80M tons Reduce rubbish disposal

1.3M tons/Y Save coal usage

78M tons/Y Reduce CO2 emission

Remark: data sources is from USGB official website2015-2018

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**Demand of
Green Construction**

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Certification System

- Brief of green construction embodiment
- Brief of LEED
- Certification process (O+M)
- Influence of LEED on investment
- Role of BDAE
- LEED Achievement

03

LEED Green measure

04

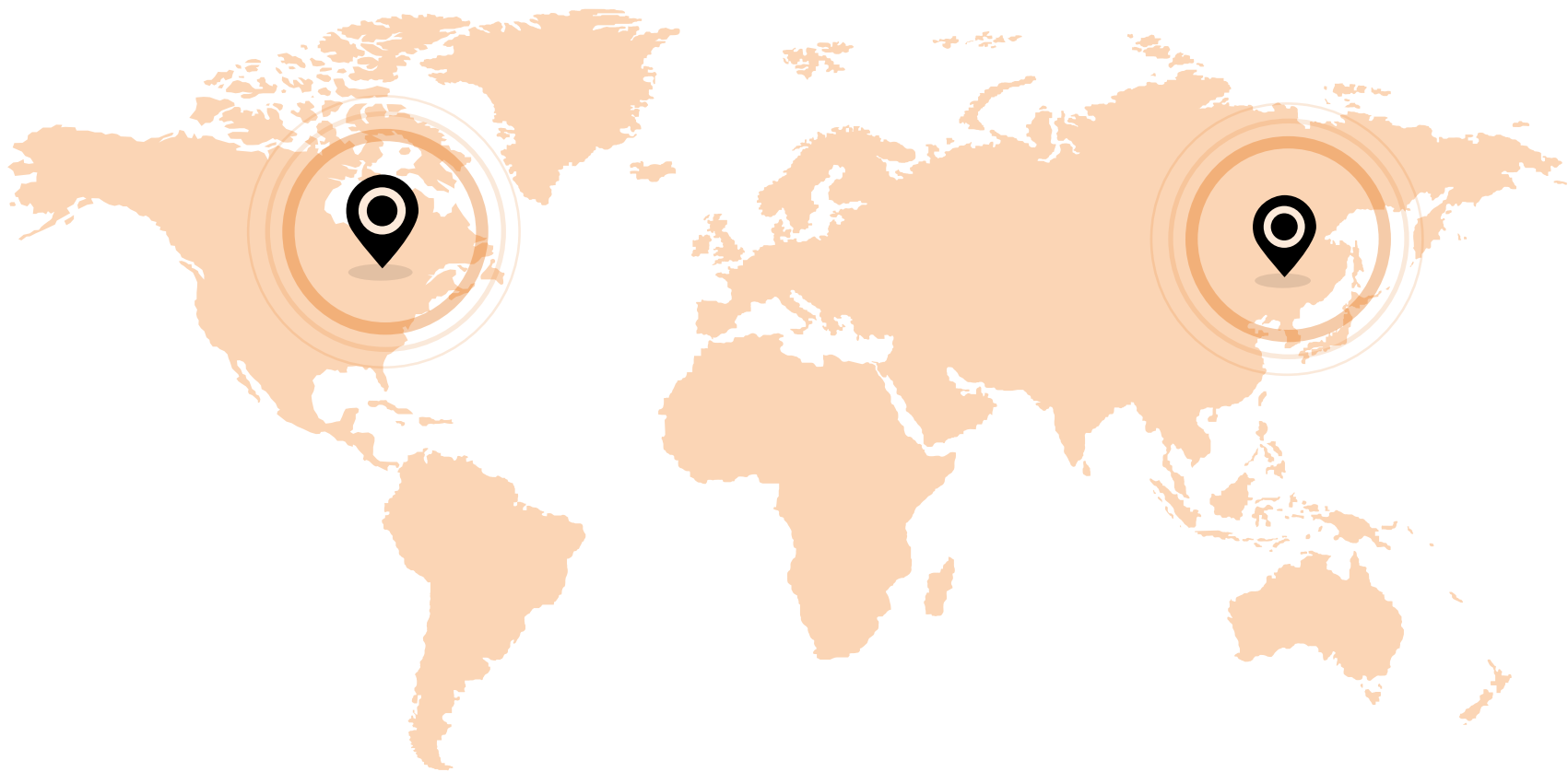
Case Analysis

05

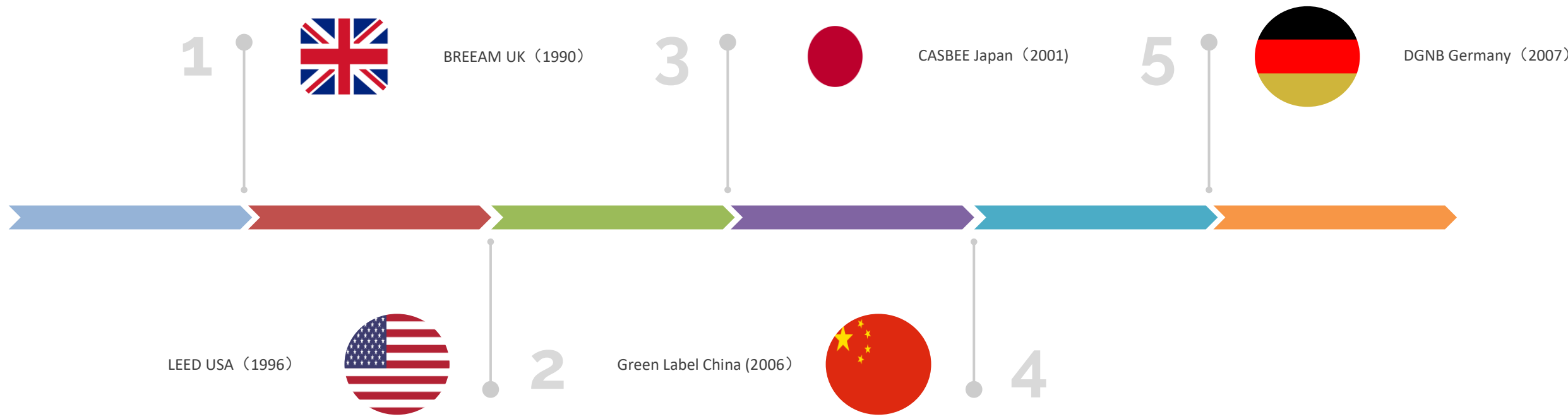
**Carbon Neutral
Service**

Green Certification System around the World

	China Green Label
	USA LEED
	UK BREEAM
	Japan CASBEE
	Germany DGNB
	France HQE
	S. Africa SBAT
	Denmark E-Top
	Norway EKO PROFILE



Development of Main Green Certification System



Brief Introduction of LEED



New building
design and
construction

Interior
design and
construction

Existing
buildings
operation
and maintain

Community
development

Residence



Pass
40-49 scores
8+ items



Silver Award
50-59 scores
15+ items



Gold Award
60-79 scores
30+ items



Platinum
80+ scores
8+ items

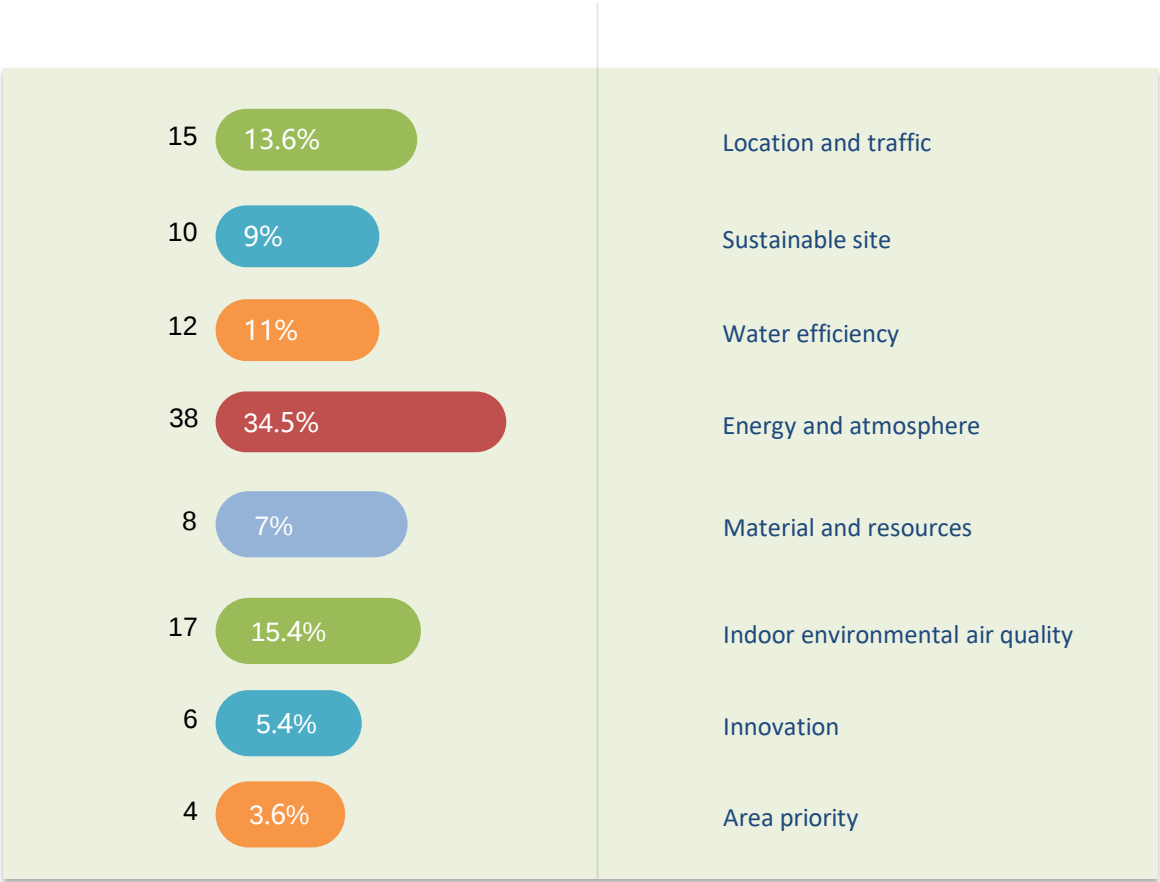
Brief introduction of LEED

- ◆ LEED (Lead in energy and environment design) V4.1;
- ◆ USGBC committed to sustainable and future development through LEED;
- ◆ LEED is the most recognized and widely used certification system around the world;
- ◆ There are over 124000 certificated items in the world, 8399 platinum items, 23308 gold award items;
- ◆ China have over 4180 certificated items, 216 platinum items, 1014 gold award items;
- ◆ China is the No. 1 country besides of USA homeland.

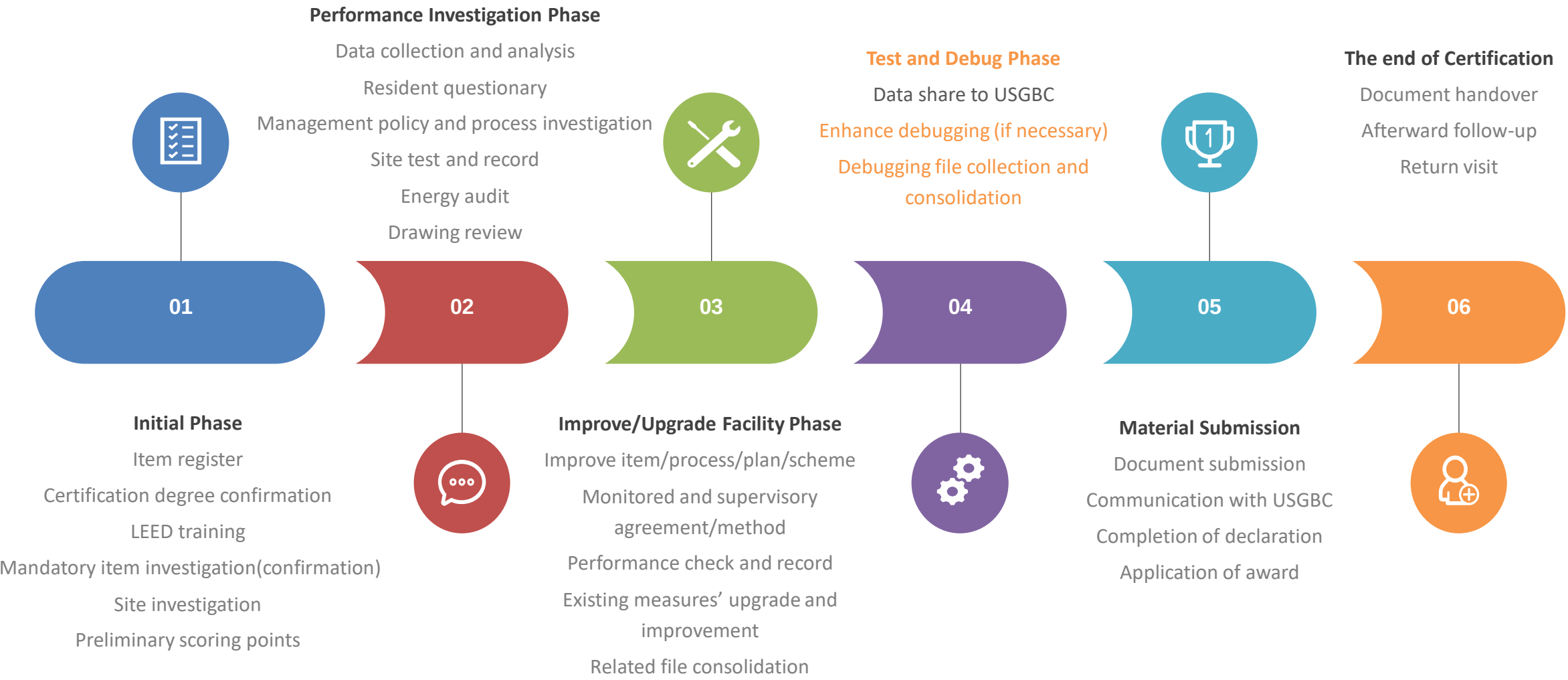


LEED Content Classification

V4.1 O&M as example , total score: 110



O+M Certification Process



Influence to the Investment

Initial Investment Increasing

0-2%

Exclusive technology device

- Energy saving : 5% - 7%
- Water saving : >20%
- Rubbish production reduction : >30%



Pass

Initial Investment Increasing

1-3%

Exclusive technology device

- Energy saving : 6% - 9%
- Water saving : >30%
- Rubbish production reduction : > 40%



Silver

Initial Investment Increasing

3-8%

Exclusive technology device

- Energy saving : 8% - 12%
- Water saving : >35%
- Rubbish production reduction : >50%



Gold

Initial Investment Increasing

>10%

Exclusive technology device

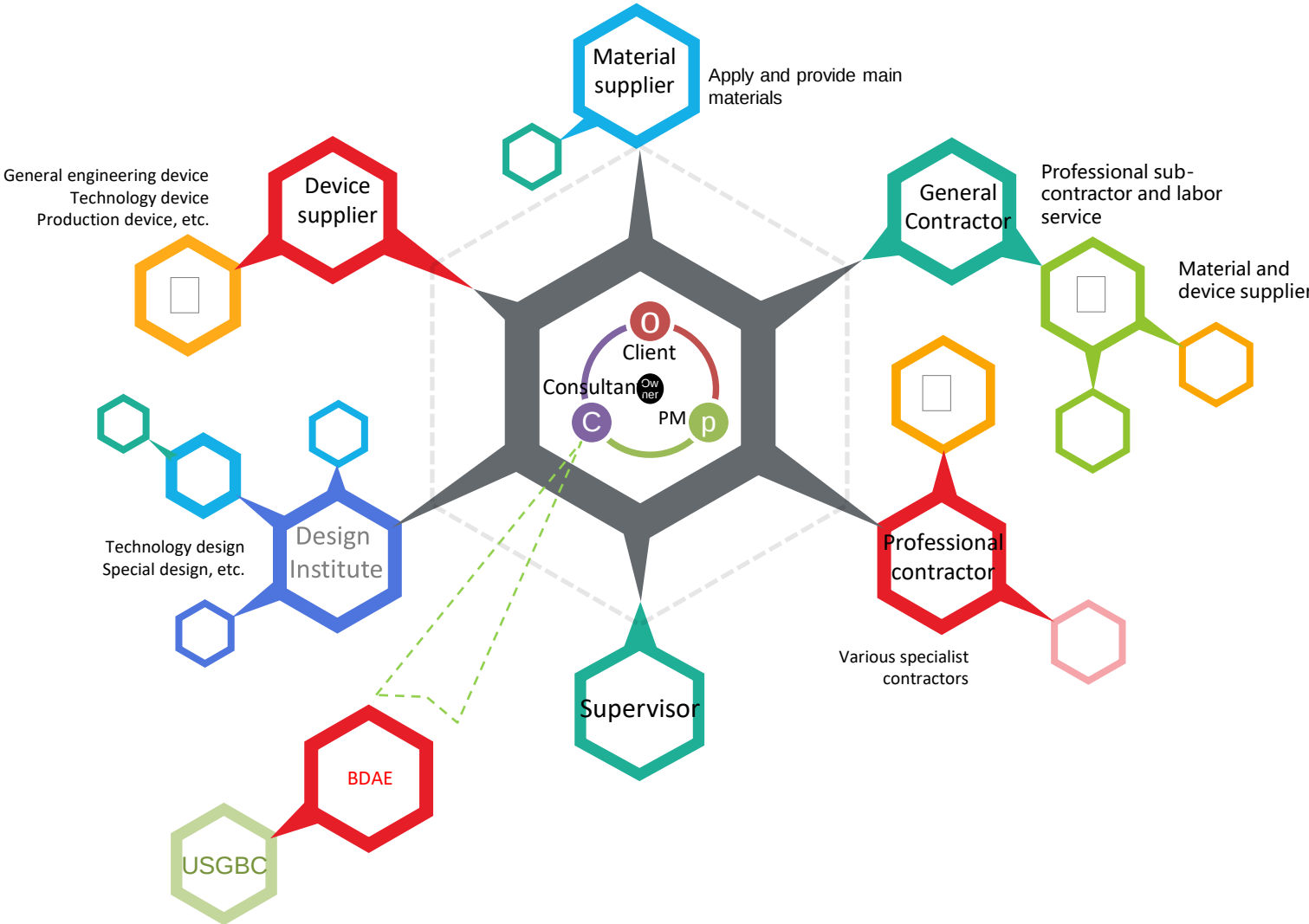
- Energy saving : >12%
- Water saving : >40%
- Rubbish production reduction : >60%



Platinum

1. Refer to ASHRAE 90.1-2010 standard
2. Refer to EPA ct 1992 standard
3. New-build and innovated construction meet national and local basic demands
4. Refer to our company's project information

Role of Consultant of LEED



Service Period

Construction
Period+6 months

Site service frequency: once a month

Related professional engineer: 6+.

LEED Achievement



LEED Certificate

The project gained the identification



LEED Award Group /project Model

Hanged, means the plant or construction gained the identification



LEED Sticker

Affixed to the inside of the building, means the construction gained the identification



LEED Manufacture Label For factory project to use

Means the product was manufactured by a LEED-identified factory

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LEED Green measure

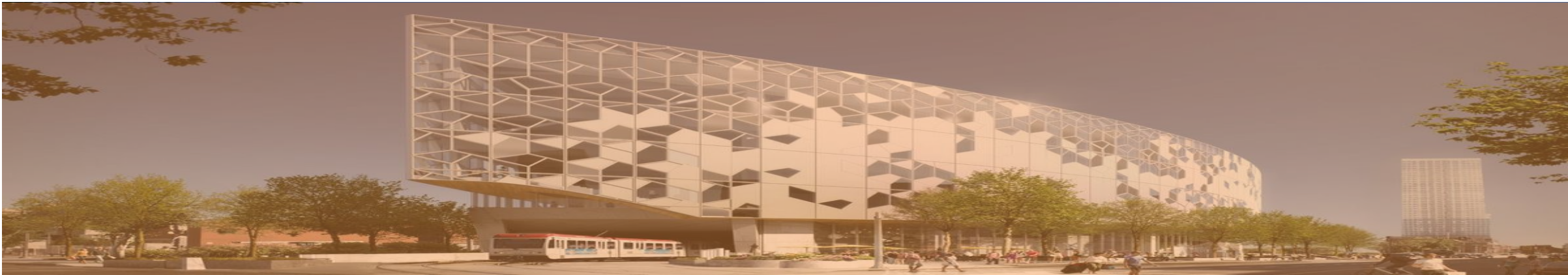
Site selection and traffic
Sustainable site
Water efficiency
Energy and atmosphere
Material and resources
Indoor air quality

04

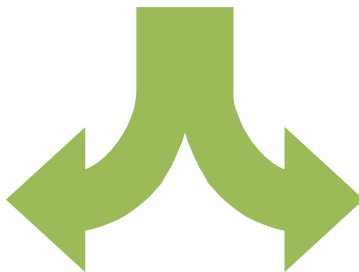
Case Analysis

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**Carbon Neutral
Service**



LEED Neighborhood Development Site



Sensitive Land
Protection



Highly-Prior
Site



Nearby building
density and
diversity of uses



Efficient Traffic



Bicycle Facility

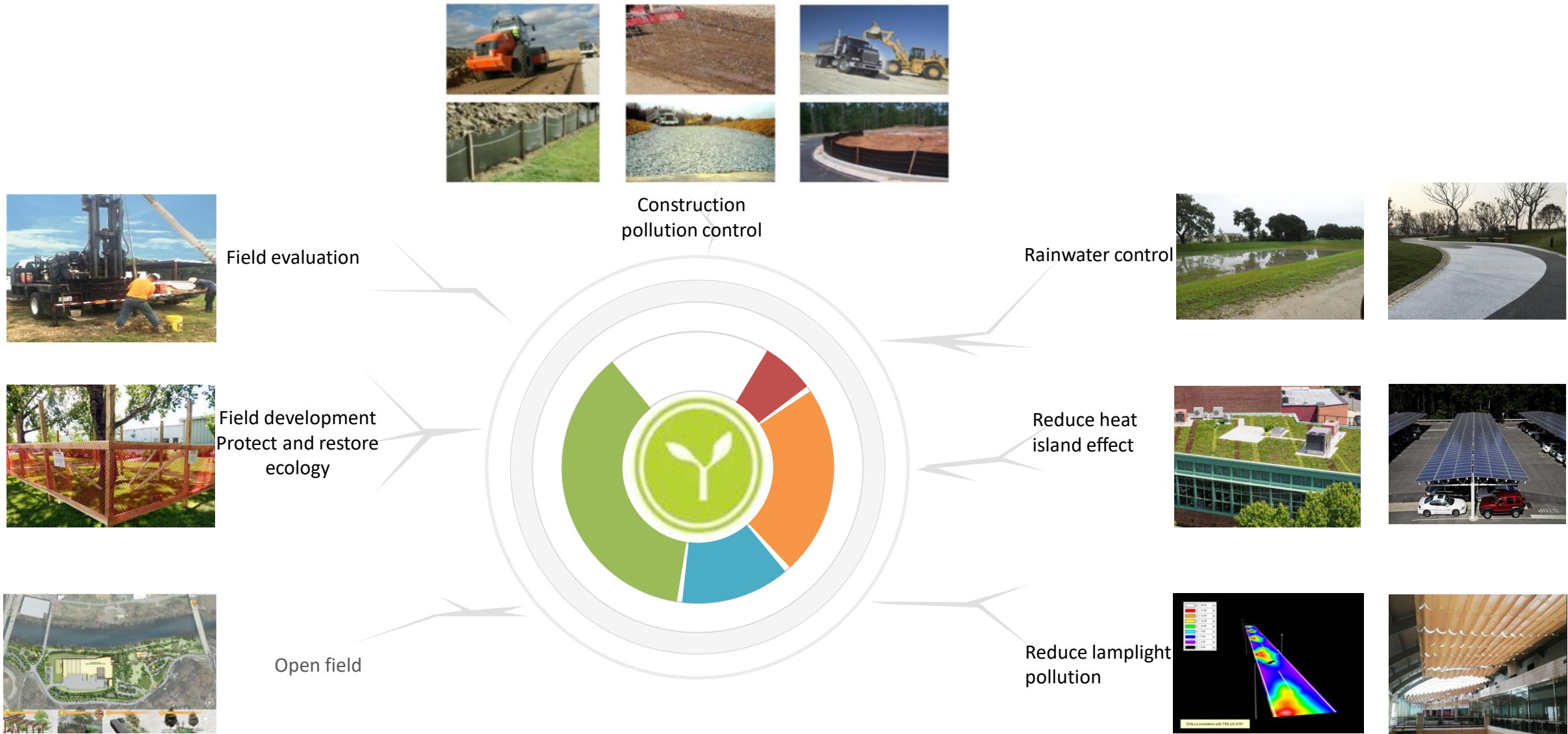


Reduce Parking
Spot

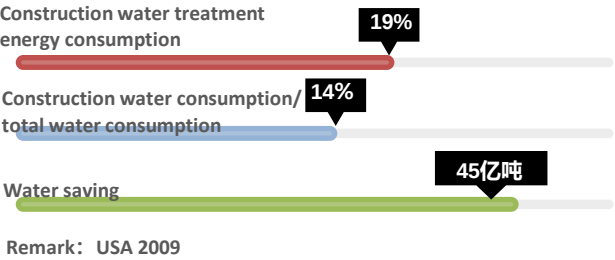


Green Vehicle

SS Sustainable Site



WE Water-use Efficiency



Through water saving measures, reduce the surface water-use, then reduce the energy and public infrastructure input on treating waste water

Water -use Efficiency

Reduce the surface water-use



Reduce outdoor water-use

Reduce outdoor greening water-use and outdoor runoff



Reduce indoor water-use

Reduce indoor sanitary ware water-use



Meter system

Perfect meter system, well-know the water consumption and meter system

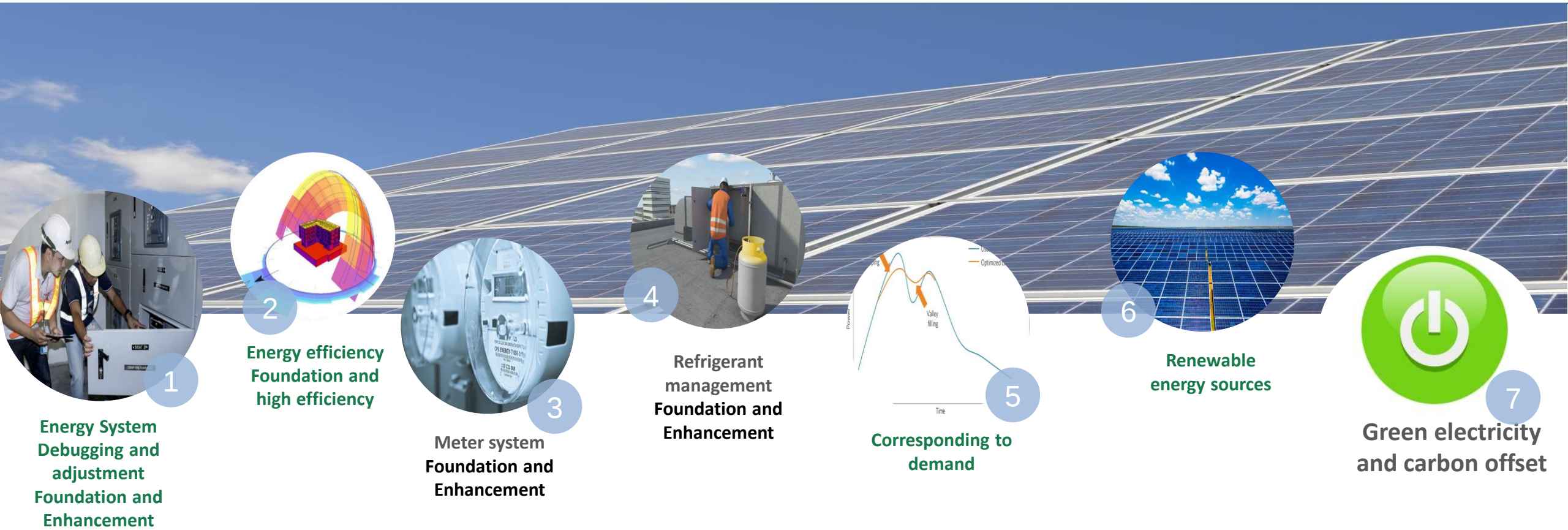


Cooling tower water-use

Reduce cooling tower water-use



EA Energy and Atmosphere



By guaranteed energy saving method, to improve energy efficiency and push the usage of recycled resources, then to reduce energy bill and demands and the input of energy fundamental facility



MR Material and Resources



Collection and storage of recycled material

Construction waste management plan

Reduce the influence to the building

Disclose the construction material and optimize green product statement

Disclose the construction material and optimize raw material and material composition

Construction waste management

During the whole building life cycle, through using recycled material and old material, to reduce the raw material demands, minimize the energy consumption and environmental impact to produce, transport, store those materials, etc.



IEQ Indoor Air Quality



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Table of score
Green measure
Project duration
influence
Cost influence

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Carbon Neutral
Service

Table of Score



LEED v4.1 for Operations & Maintenance: Existing Buildings
Scorecard

Project name: Libao Plaza

Y	?	N			
14	0	0	Location and Transportation	14	
14			Prereq Transportation Performance	14	
0	2	2	Sustainable Sites	4	
		1	Credit Rainwater Management	1	
		1	Credit Heat Island Reduction	1	
	1		Credit Light Pollution Reduction	1	
	1		Credit Site Management	1	
12	3	0	Water Efficiency	15	
12	3		Prereq Water Performance	15	
31	3	1	Energy and Atmosphere	35	
Y			Prereq Energy Efficiency Best Management Practices	Required	
Y			Prereq Fundamental Refrigerant Management	Required	
30	3		Prereq Energy Performance	33	
1			Credit Enhanced Refrigerant Management	1	
		1	Credit Grid Harmonization	1	
8	1	0	Materials and Resources	9	
Y			Prereq Purchasing Policy	Required	
Y			Prereq Facility Maintenance and Renovations Policy	Required	
7	1		Prereq Waste Performance	8	
1			Credit Purchasing	1	
20	2	0	Indoor Environmental Quality	22	
Y			Prereq Minimum Indoor Air Quality	Required	
Y			Prereq Environmental Tobacco Smoke Control	Required	
Y			Prereq Green Cleaning Policy	Required	
18	2		Prereq Indoor Environmental Quality Performance	20	
1			Credit Green Cleaning	1	
1			Credit Integrated Pest Management	1	
0	1	0	Innovation	1	
0	1		Credit Innovation	1	
85	12	3	TOTALS	Possible Points: 100	

Certified: 40-49 points, Silver: 50-59 points, Gold: 60-79 points, Platinum: 80+ points

Initial target:
69 scores



Achieved target:
85 scores



Social Economic Benifit

➤	Traffic performance investigation	¥ 20,000
➤	Energy audit report LEVEL-1	¥ 30,000
➤	Indoor air quality test	¥ 200,000
➤	Green cleaning	¥ 10,000
➤	Add water meter	Already had
➤	Green purchasing	Existing
➤	F7 medium efficiency air filter	Existing
➤	In total	¥ 260,000



Shanghai LIPPO PLAZA
LEED O+M Platinum award

Main Green Measures



- Location and traffic
- Employee traffic survey chart



- Energy and efficiency:
 - ✓ Energy audit LEVEL-1
 - ✓ Foundation/enhancement of refrigerant management
 - ✓ Energy efficiency evaluation
 - ✓ Grid connection corresponding

- Water efficiency
- Water saving performance calculation



- Material and resource
- Purchasing policy
- Facility maintain and improvement management
- Waste performance
- Purchasing

- Indoor air quality
- Lowest indoor air quality
- Smoking control environment and high efficient filter
- Green cleaning policy
- Indoor air quality performance
- Green cleaning
- Comprehensive inspect pest management



Major Green Measures



- ➡ Reducing 95% waste
- ➡ Saving 40% water consumption per year
- ➡ Saving 50% energy consumption per year (including solar energy)
- ➡ Reducing 500 tons carbon emission per year
- ➡ Improving indoor environmental quality and satisfaction of employees
- ➡ Reducing the cost of building operations and maintain



The Impact Of LEED On The Project



Gain the certificate
in 3 months



It's necessary to hire a
third party for indoor
air quality

No influence to
operations



Little cost
increasing on
green measures



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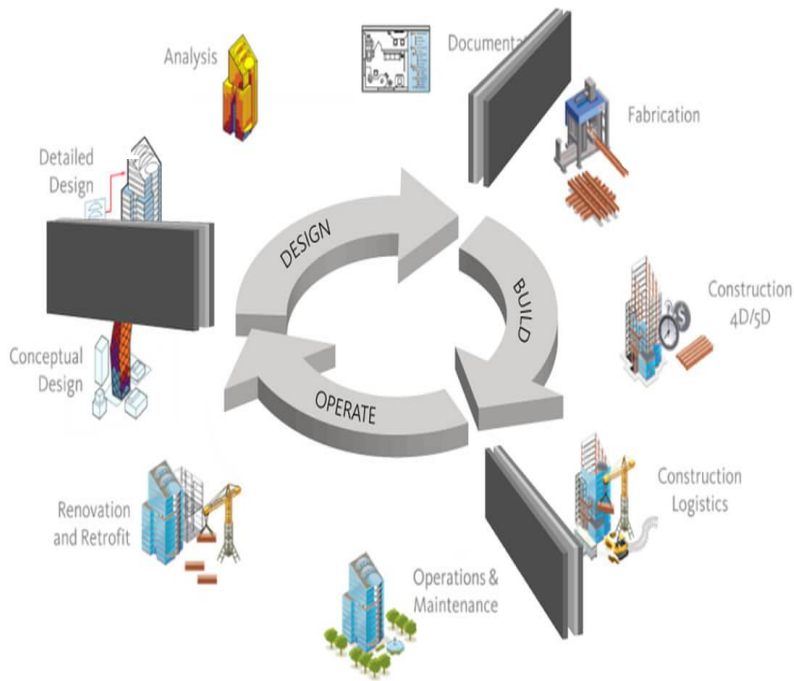
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Case Analysis

05

**Carbon Neutral
Service**

Carbon Management Business Structure



1

Green Construction Consulting

2

Carbon Neutral

3

Energy Scheme

4

Sustainable energy sources

1

- ▢ LEED
- ▢ WELL
- ▢ China Green Building Council

2

- ▢ Carbon neutral
- ▢ Carbon footprint/emission evaluation
- ▢ Carbon trading
- ▢ Carbon emission reduction scheme

3

- ▢ Energy Consultant
- ▢ Energy saving measures
- ▢ Energy debugging
- ▢ Contract energy management

4

- ▢ Construction general contract
- ▢ PPA (power supply agreement)
- ▢ Renewable energy sources consulting

LEED Consultant-Some Projects Achievements



Certified
通过级



Silver
银级



Gold
金级



Gold
金级



Gold
金级



Platinum
铂金级



Platinum
铂金级



Platinum
铂金级

LEED Consultant-Some Projects Achievements



CONTACT US

Phone +86 021 3417 2901

Mail info@bd-ae.com

Web www.bd-ae.com

Add Tower 7-506, Lotus International Plaza
Lane 7866, Humin Road, Shanghai, P.R.C



BDAEwechat



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