美国能源部Better buildings
建筑数据公开项目介绍

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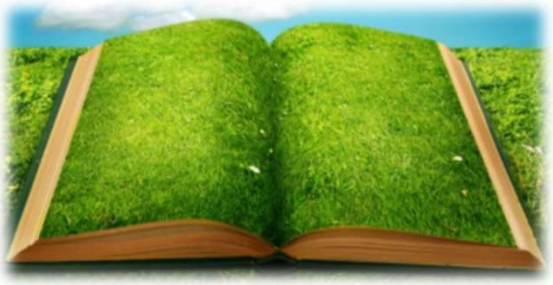
2019-3-29 上海

中国建筑节能协会

目录



一、美国Better buildings背景简介

美国Better buildings背景简介

背景

- “美国好建筑” 是一个国家性的领导人倡议的项目，2011年由奥巴马总统发起，美国能源部具体执行并提供财政支持；
- 呼吁行政领导人、高校校长、公用事业公司的高管、业主、地方官员以及其他领导人，合作做出开展提升各自的公共建筑、住宅以及工业建筑能效的实质性的承诺，继而转化为创造经济上的节约。

目标

在公建、居住、工业等领域，10年内提升建筑能耗20%。

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总体框架

建筑业主以单体或区域的形式，承诺10年内提供建筑能效20%目标

Challenge
挑战

重点攻克能效提升过程中的市场、制度、技术、产品等障碍

Solution Center
方案解决中

Action
行动

Accelerator
加速器

收集整理建筑能效提升过程中的技术、方法、数据、案例，供建筑业主参考

Promotion
联盟

BB联盟为一个综合团体，包含技术和市场领域的研究人员和机构，开发和部署创新和有效的节能解决方案。

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项目领域

数据中心

酒　店

医疗建筑

零　售

商业中心

高　校

小初高中

公　寓

政府大楼

快餐店

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参与流程

1. 签署能效提升协议
2. 目标制定
3. 确定能耗基线
4. 追踪建筑用能信息
5. 认可与反馈

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成果简介

成果	2014	2015	2016	2017
节能量（Btus）	94 万亿	160 万亿	240 万亿	380 万亿
节能成本	8.4 亿	13 亿	19 亿	31 亿
二氧化碳减排量（吨）	580 万	1000 万	1500 万	2300 万
投资金额	55 亿	55 亿	86 亿美元	120 亿美元
节水（加仑）	3 亿	23 亿	40 亿	63 亿
合作伙伴在线解决方案	**375+**	**400+**	**1,000+**	**1,500+**
合作伙伴和联盟数量	**190+**	**310+**	**345+**	**350+**
挑战面积	**35 亿**	**42 亿**	**44 亿**	**44 亿**

一路增长

二、美国Better buildings 建筑数据公开

- 如何拿到数据？
- 怎么公开？

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基于自承诺数据公开

基于自愿承诺10年内提升能效20%的目标，并不是公开所有用能数据，仅公开处理后的数据（EUI）。

- （1）建筑位置（市/省/国家），用于查找相应的天气数据；
- （2）总建筑面积（不包括停车场）用于对能耗进行归一化处理；
- （3）建筑的主要/二级空间使用类型，用于和同类型建筑进行对标；
- （4）月度物业账单开支及成本数据（按能源类型划分），必须包括电力和化石燃料（如有）的能耗数据，需要至少1年的数据，每个能耗数据都应有开始和结束日期。

提交信息简单 **流程少不复杂** **提供专业解决方案** **达标后获得认可表彰**

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建筑数据加速器

建筑能效加速器：获得建筑业主能耗信息。

- **地方政府：**通过当地和州政府政策强制公开的建筑用能，纳入建筑节能法律条例。
- **公共事业机构：**与公用事业监管管理机构（公用事业委员会），他们有权对公用事业公司（电力公司、供热、制冷公司、市政公司等）进行监督和访问。
- **Energy star认证：“能源之星住宅计划”**，须经过第三方的验证，以确认营造商已适当地采用了提高能源效率的措施。只要能看到能源之星的标识，住宅的购买者不是专家也能够很有信心地作出购买决定。

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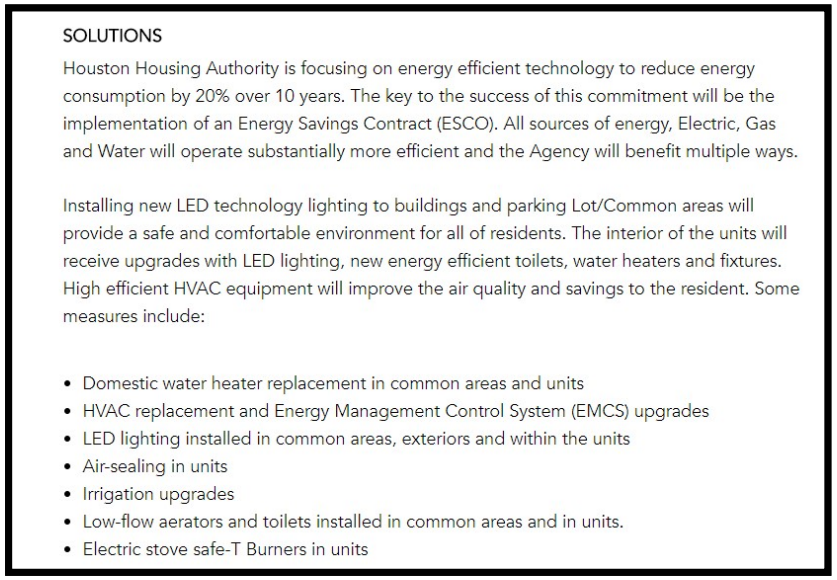
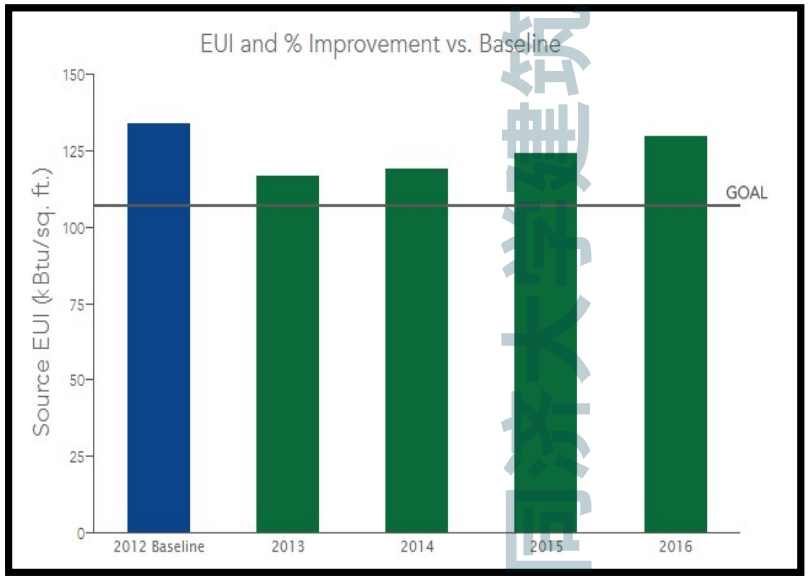
数据追踪和展示

目标完成情况



解决方案



EUI分析

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激励措施

美国好建筑峰会—授牌名单

DOE RECOGNIZES 2018 BETTER BUILDINGS CHALLENGE GOAL ACHIEVERS

Today, the U.S. Department of Energy (DOE) recognized 19 Better Buildings Challenge partners who achieved their energy productivity goals for 2018 and 26 partners who have set new Challenge goals after meeting their initial goals. Since the start of this voluntary program, Better Buildings Challenge partners together have saved $3.1 billion in energy-cost savings and 380 trillion British thermal units of energy.

Since the start of the program, more than 65 partners and financial allies have met their energy efficiency, water efficiency and/or financing goals ahead of schedule. Many of these goal achievers have publicly committed to new Challenge goals, demonstrating that continual energy efficiency improvement is possible even after sizable gains have already been made.

DOE recognizes the following partners for achieving the energy, water, and financial goals they set as partners in the Better Buildings Challenge:

- Anthem, Inc (energy and water) – Indianapolis, Indiana
- Ascension (energy) – St. Louis, Missouri
- Bank of America Merrill Lynch (financial) – New York, New York
- C. F. Martin & Co., Inc. (energy) – Nazareth, Pennsylvania
- Citi (financial) – New York, New York
- City of Chicago, Illinois (energy) – Chicago, Illinois
- Columbia Association (energy) – Columbia, Maryland
- EDF Renewables (financial) – San Diego, California
- General Motors (energy) – Detroit, Michigan
- Jersey City Housing Authority (energy) – Jersey City, New Jersey
- Legrand (energy) – Hartford, Connecticut
- Metrus Energy (financial) – San Francisco, California
- New York City Energy Efficiency Corporation (financial) – New York, New York
- PACE Equity (financial) – Milwaukee, Wisconsin
- Shari's Café & Pies (water) – Beaverton, Oregon
- Sol Systems (financial) – Washington, D.C.
- State of North Carolina (energy)
- Tower Companies (water) – Rockville, Maryland
- UW Health (energy) – Middleton, Wisconsin

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Moving Our Nation Forward, Faster Progress Report 2016

年度报告

DOE BRINGS ENERGY TRAINING AND PEER EVENT TO CLEVELAND

ENERGY DEPARTMENT BRINGS ENERGY TRAINING AND PEER EVENT TO CLEVELAND TO EXPAND PROGRESS IN RESILIENT ENERGY AND WATER MANAGEMENT IN FEDERAL FACILITIES

The U.S. Department of Energy (DOE) is hosting the Energy Exchange and Better Buildings Summit, the largest DOE training, trade show, and peer-to-peer knowledge sharing event of the year, in Cleveland, Ohio, from August 21–23, 2018. Co-sponsored by DOE's Federal Energy Management Program and Better Buildings Initiative, the event is an annual, collaborative forum between the federal government, industry, and state and local stakeholders within the building, energy, water, and transportation communities. Thought leaders will convene to work toward accelerating the adoption of energy and water efficiency, integrated resilience, emerging and secure technologies, and replicable renewable energy solutions.

This year's event features more than 200 technical training sessions and serves as DOE's most dynamic opportunity to share best practices, provide technical information and tools, and offer accredited training to federal facility and energy managers. DOE will recognize innovative private sector partners and federal leaders at the FEDS Spotlight and Better Buildings Challenge Partner Recognition sessions and will provide on-site technical expertise alongside experts from the national labo

技术交流培训

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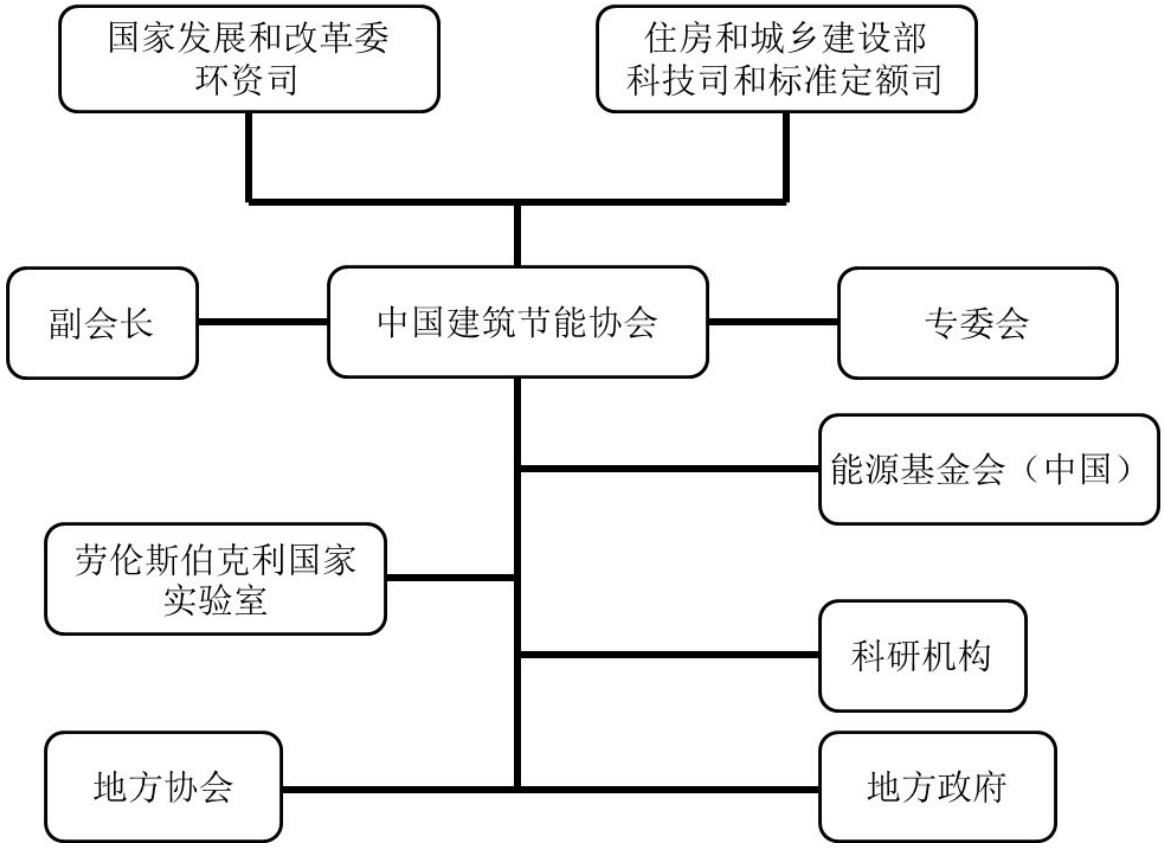
三、中国好建筑—China Better Buildings

组织机构



- 发改委+住建部：支持和指导
- 中国建筑节能协会：牵头组织
- 能源基金会（中国）：资金和技术支持
- 劳伦斯伯克利+科研机构：技术支持
- 地方协会+地方政府：合作机构

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理念和目标

- 节能建筑就是好建筑么?
- 什么样的建筑能够代表中国好建筑?

健康、舒适、绿色、
智慧、低碳

Ideal
理念

10年内实现建筑能效提升
20%目标

Goal
目标

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目标和对象

既有

- 既有单体（公建和居建）
- 既有区域（城市、城区、园区）

- 在满足建筑健康、舒适、绿色的基础功能上，5-10年内建筑能效提升10-20%的目标。
- 针对能效高的建筑可降低目标，5年内提升能效10%。针对能效低的建筑，10年内提升能效20%。

新建

- 新建单体（公建和居建）
- 新区/建筑群（城市、城区）

- 在满足新建建筑健康、舒适、绿色的基础功能上，建筑能效高于当地强制性标准20%。
- 且建成后运行效果要比地方强制性标准或者地方同类建筑平均值高10-20%。

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合作伙伴召集

商业办公
13

医院
2

学校
15

酒店
4

居住
5

城市
4

34个

2个

43个

306万m²

同济大学建筑能源学术日

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建筑能耗对标工具

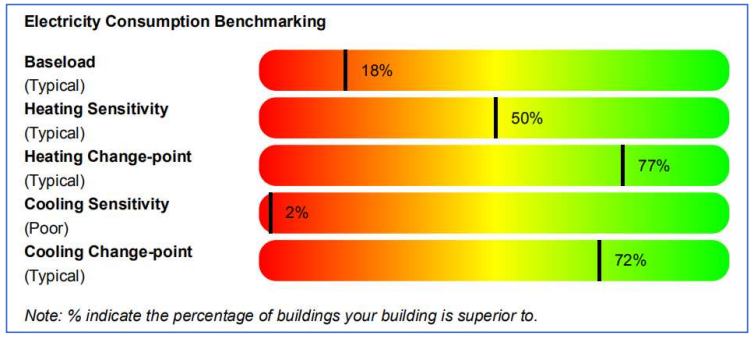
建筑能耗基线确立

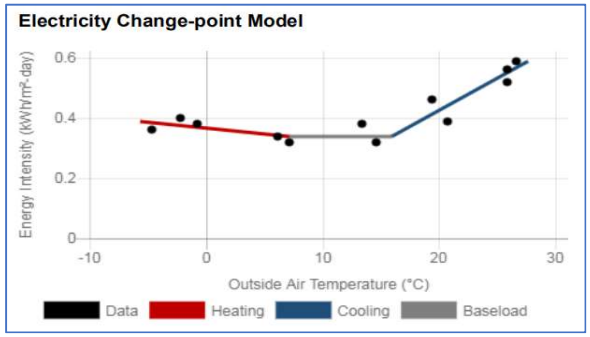
BERKELEY LAB
Lawrence Berkeley National Laboratory

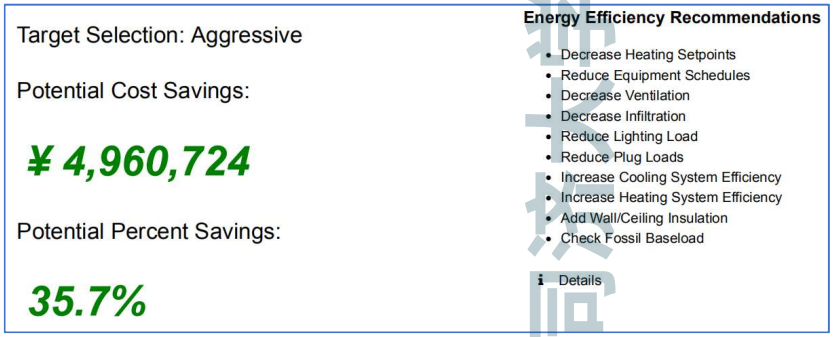
Johnson Controls

CABEE

建筑能源审计报告







确定能耗基线和典型建筑对标

天气影响敏感性分析

节能潜力分析和改造建议

建筑能耗基线确立

案例：珠海兴业新能源产业园研发楼

建筑基础信息表

联系信息			
姓名	李进	电话	18025083899
邮箱	Lijin	单位	Lijin@zhsye.com
建筑信息			
建筑名称	珠海兴业研发办公大楼		
建筑类型	办公建筑		
城市地区	广州珠海市		
地址	广东省珠海市香洲区科技创新海岸金珠路 9 号		
建筑面积（m^2）	23000		
建筑竣工时间	2017 年 2 月		

建筑能耗和价格表

能源 年份	外购 电耗	外购 天然气	外购 蒸汽	外购 采暖热量	外购 冷量	太阳能 发电量	其它能源
	（KW·h）	(m^3)	(吨)	(GJ)	(GJ)	（KW·h）	（KW.h）
2017-5	73,163					12440	
2017-6	98,816					14131	
2017-7	86,538					15544	
2017-8	96,355					16014	
2017-9	85,678					15344	
2017-10	49,567					14482	
2017-11	41,836					8948	
2017-12	38,572					10754	
2017-1	44,385					8090	
2017-2	32,529					8734	
2017-3	37,168					12968	
2017-4	36,809					12862	
合计	721,416					150,311	

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建筑能耗基线确立

Saving Potentials

Target Selection: Nominal

Potential Cost Savings:

¥ 59,486

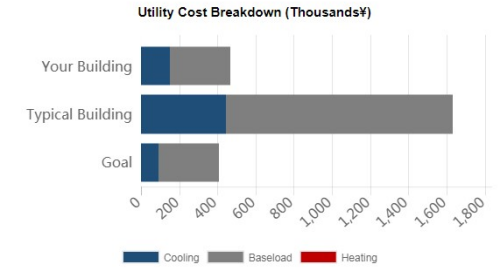
Potential Percent Savings:

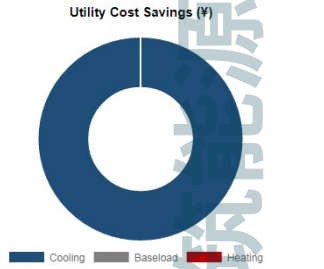
12.7%

Energy Efficiency Recommendations

- Increase Cooling System Efficiency

ℹ Details





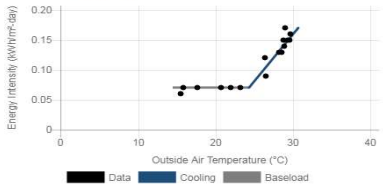
Show/Hide original and predicted consumption with upgrade

Weather Sensitivity and Benchmarks

Daily electricity and fossil fuel use per floor area is plotted below against monthly average outdoor air temperature. When energy use goes up at low temperatures on the left side of the graph, it represents heating energy. When energy use goes up at high temperatures on the right side of the graph, it represents cooling energy. The flat part of the graph shows the buidling's base load.

Electricity: Your consistent baseload is 0.1 kWh/(m^2*day), or 26.0 kWh/(m^2*yr) **[Baseload]:**. The building is in cooling mode when the outside air temperature is above 24.3 °C **[Cooling Change Point]**. During cooling, the building daily energy consumption increases by 376.5 kWh/day for each 1 degree increase in outside air temperature **[Cooling Sensitivity]**.

Electricity Change-point Model



Electricity Consumption Benchmarking

Baseload (Good) — 99%

Cooling Sensitivity (Poor) — 12%

Cooling Change-point (Good) — 100%

Note: % indicate the percentage of buildings your building is superior to.

ℹ Details

Energy Efficiency Recommendation Details

More details on each energy efficiency opportunity identified

Increase Cooling System Efficiency

Your building cooling load is higher than similar buildings for similar weather conditions. HVAC system performance has big impact on building energy consumption. Check your cooling system, all related equipment and controls to improve system efficiency. Upgrading your system to a more efficient model, will reduce your system energy consumption.

Note: Special thanks to Johnson Controls (JCI) technical team for their valuable technical support and for their algorithm in identifying Energy Efficiency Recommendations.

感谢大家聆听！

王野

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