



SUSTAINABLE ENERGY BUSINESS DISTRICTS

Enabling Clean Energy Deployment for Cities in China

Q1 2015
PROGRESS REPORT

CONTENTS

The Sustainable Energy Business Districts (SEBIZ) program is helping to address China's urban energy needs and greenhouse gas emissions at the city-level by leveraging a successful public-private partnership collaboration model in targeted Chinese cities. The program is being implemented by Optyony Inc. and funded by the U.S. Department of Energy.



SEBIZ project team released sector-specific clean energy deployment resource guides



Key SEBIZ program challenges and opportunities have been documented



Sustainable Energy Planning Report published for Green Dragon Lake district



Initial program results and achievements released for SEBIZ business district in Wujin



Overview of official SEBIZ Business Districts in China

FOR MORE INFORMATION

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SEBIZ Project Team Releases Clean Energy Deployment Resource Guides for Stakeholder Groups

To support the replication of the SEBIZ model in cities across China and beyond, the project team drafted three resource guides for three key stakeholder groups: local governments, commercial building owners, and solution providers.

Throughout 2014, the SEBIZ project team has been busy with program implementation. Primary activity areas included stakeholder engagement, commercial building energy audits, documentation of clean energy project opportunities, identification qualified solution providers, buyer-vendor matchmaking, and report writing. Many deliverables were completed and many goals were achieved.

One of the highlights is the publication of a series of sector-specific resource guides for the three key SEBIZ stakeholder groups: local governments, commercial building owners, and clean energy solution providers. Active participation from each of these actors was instrumental to the overall success of the program, though each of them played a different role. The SEBIZ project team has documented valuable lessons learned through project implementation in these resources guides, which have been made publicly available to encourage replication of the model ▶



Low-carbon city demonstration project in Wujin District, Changzhou City

The image displays three covers from the 'Sustainable Energy Business Districts' resource guide series. Each cover features the title 'Sustainable Energy Business Districts' and a subtitle 'Enabling Clean Energy Deployment for Cities in China'. The first cover is for 'Local Governments', the second for 'Commercial Buildings', and the third for 'Solution Providers'. Each cover includes a circular image and a key takeaway: 'Clean Energy Aggregation Models Can Accelerate Carbon Reductions', 'Aggregated Energy Upgrades Across Building Portfolios Save Time & Money', and 'Strategic Partnerships & Comprehensive Solutions Can Expand Market Share' respectively. The covers also list 'Clean Energy Deployment Resource Guide Series' and 'LOCAL GOVERNMENTS', 'COMMERCIAL BUILDINGS', and 'SOLUTION PROVIDERS'.

SEBIZ Clean Energy Deployment Resource Guide Series, available at www.cleanenergyroadmap.com/about/sebiz

and approach. In addition to sharing lesson learned, these guides highlight the key challenges and opportunities identified during program implementation, as well as considerations that stakeholders ought to take into account for new and existing efforts.

The local government guide focuses on how public agencies can leverage district-level organizations to achieve their clean energy and carbon reduction goals faster. The commercial building guide focuses presents the SEBIZ portfolio approach to energy retrofits and upgrades for commercial building owners and commercial tenants. Finally, the solution provider guide provides insight and considerations for clean energy solution providers that are contemplating strategies for entering and expanding into the Chinese market. To download these resource guides, please visit the website noted above. ■

"Thank you again for connecting me with the Sustainable Energy Business District (SEBIZ) project via the recent US Department of Commerce certified energy efficiency trade mission to China. As a small business person and independent consultant, SEBIZ introduced me to business and project opportunities that I never would have been able to access on my own. The opportunities were extremely well developed and mature. As a result, I was able to come away with substantial, actionable opportunities that I am now in the process of following up on. The success was no doubt due to the Optony's innovative and inclusive approach to US-China business development, outstanding leadership and commitment to improving China's energy efficiency, and deep professional experience in China."

**---Ms. Julia Beabout
President, Simulated Solutions**

SEBIZ CHALLENGES AND OPPORTUNITIES IDENTIFIED

The SEBIZ project team has summarized the key challenges and opportunities for project implementation

Clean energy upgrades for new and existing commercial buildings offer a multitude of benefits. Energy efficiency and renewable energy projects can help reduce operating budgets, achieve environmental policy goals, and stimulate local economic development and job creation. However, these benefits do not come without challenges. Smaller, distributed projects often lack the scale necessary to capture the interest of building

Owners and solution providers alike. The SEBIZ model was developed help to overcome this barrier and associated obstacles to accelerate technology deployment at the local level. The SEBIZ project team has documented some of the common challenges and opportunities identified during program implementation, which are listed on the next page. ▶

CHALLENGES	OPPORTUNITIES
<p>Upfront Cost. Commercial building owners or businesses often lack sufficient capital to finance their own efficiency improvements and savings accrue over time. Customers tend not to make investment upgrades for this reason, even when the paybacks are relatively short.</p>	<p>Shared savings models and energy savings performance contracts are becoming increasingly popular and available in the Chinese market. Education and awareness building about this financial model could be effective. Customers need to be comfortable with calculation methodologies.</p>
<p>Expectations For Savings & Payback. Building owners tend to be willing to make improvements only when paybacks are short (1-2 years) or if the savings are too significant to pass up. Small savings, even if economical, often lose out to competing priorities.</p>	<p>Shared savings models and energy savings performance contracts are becoming increasingly popular and available in the Chinese market. Education and awareness building about this financial model Could be effective. Technically the paybacks are immediate, but details are important.</p>
<p>Split Incentive. This issue is very common in the commercial building sector when buildings are not owner-occupied. Generally, owners do not receive the benefit from an investment and tenants have no incentive to make an investment in a building it does not own.</p>	<p>Development of new financing models, such as PACE financing, and/or agreements such as green leases that allow for the savings to pay off the investment over an extended period of time at low rates and not be tied to a tenant.</p>
<p>Lack of Awareness. Building owners and occupants are often not aware of the impact their actions have on energy use or the potential benefits that can be attained from energy efficiency measures.</p>	<p>Education and awareness building about the relative cost-effectiveness of energy efficiency measures can be effective when combined with other benefits and opportunities, such as occupant comfort and shared savings models.</p>
<p>Competing Priorities. Energy efficiency is only one of many important considerations a building developer or owner has when making decisions about a building.</p>	<p>Whole building approach to energy efficiency upgrades can simplify the process for building owners and vendors. Recognition programs can be effective in encouraging action as well.</p>
<p>Low Concern for Occupant Comfort. In China it is not uncommon for commercial building occupants to work in conditions of insufficient lighting or thermal discomfort in order to save energy.</p>	<p>Education and awareness building about the increased productivity and worker retention benefits associated with building occupant comfort. This can be even more effective when combined with a campaign for behavioral energy efficiency awareness.</p>
<p>Transactions Costs. Building-level distributed energy efficiency projects often lack the scale necessary to be economically viable due to relatively high transaction costs associated with small projects.</p>	<p>Project aggregation models such as SEBIZ help reduce transaction costs by bundling project opportunities to build scale.</p>



"Optony helped our school to identify several energy efficiency and renewable energy opportunities by on-site energy audit, such as solar carport and building energy management system. It is very helpful for us to reduce operation costs and enhance management efficiency. We appreciate the professional analysis from each member of the SEBIZ team. Because of their hands-on support, we are seriously thinking about solar carport and EV charging stations. As it not only shows support for the government's goals, but increase the visibility of the school's "green" initiatives."

---Mr. Jiang Jianwen
Director of Logistics Management Department
TsingYing Foreign Language School

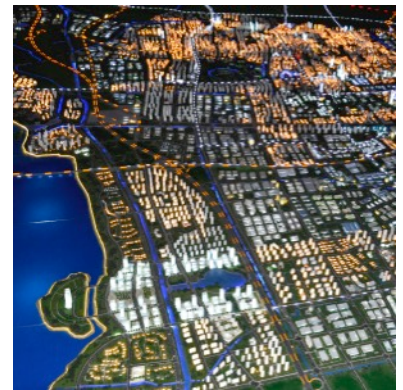
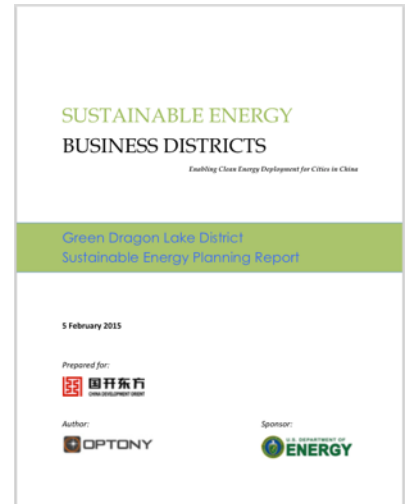
SUSTAINABLE ENERGY PLANNING REPORT RELEASED

The SEBIZ team completed a highly anticipated report for the Green Dragon Lake district

In February 2015, Optony Inc. released a highly anticipated Sustainable Energy Planning Report for the SEBIZ program. This report was written for China Development Orient (CDO), the project developer of the multi-billion dollar Green Dragon Lake (GDL) district currently under construction in southwestern Beijing. The intent of the report is to assist CDO in identifying advanced clean energy technologies and building design approaches that are ready for immediate deployment and can be incorporated into the design and construction of the business district.

The report begins by outlining the importance of sustainable energy planning in China and provides an overview of the SEBIZ program. Section 2 provides an overview of commercial building energy trends in China. Section 3 provides an overview of district-level building design techniques. Sections 4 and 5 delve into advanced energy efficiency and renewable energy technologies that can be immediately incorporated into the design of smart, high-performance commercial buildings. Section 6 provides an overview of the importance of proper building operation. The final section consists of five case studies from the U.S. that highlight success stories for different building types that are applicable to the Green Dragon Lake District.

The desired outcome of the GDL project is to develop a framework for district level sustainable energy design standards that can be replicated in any other urban districts in China and beyond. The report is available at: http://www.cleaneenergyroadmap.com/wp-content/uploads/2015/02/GDL-Sustainable-Energy-Planning-Report_FINAL.pdf. ■



THE SEBIZ PROJECT AGGREGATION MODEL EXPLAINED

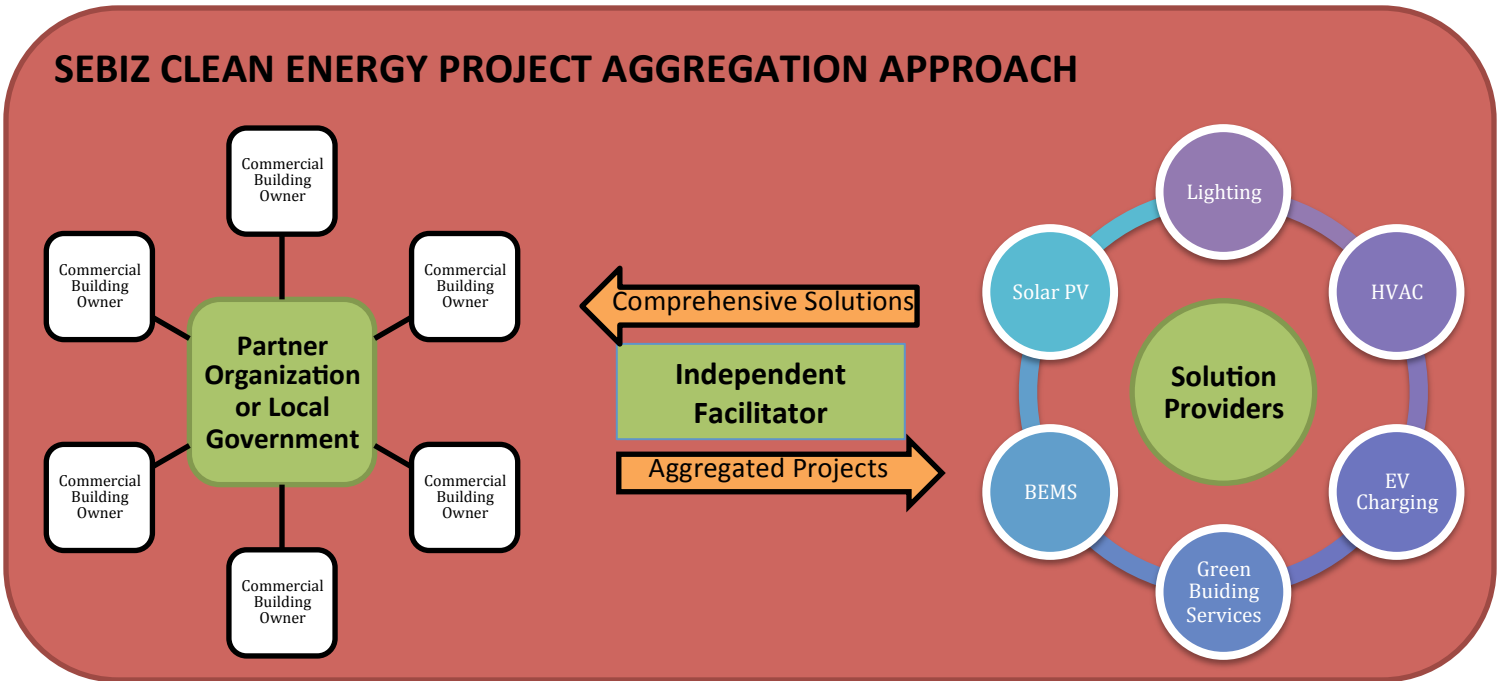
Portfolio approach to distributed clean energy project development that can accelerate carbon reductions

Citywide clean energy programs are often ineffective at realizing their full potential due to the inability to adapt to shifting markets or having too broad of a scope. On the other hand, project development at the individual commercial building level lacks the scale necessary to achieve meaningful cost reductions. The SEBIZ project team took an alternative approach by working with leadership organizations at the district-level in China to aggregate clean energy project opportunities across a portfolio of commercial buildings. The success of this model depends in large part on three main stakeholder groups, as described below.

PARTNER ORGANIZATION

The partner could be a district-level organization or a local

government that can effectively support the recruitment of individual commercial building owners to participate. Alternatively, this organization could be a corporate entity with a portfolio of buildings. In the case of SEBIZ, the Wujin National Hi-Tech Industrial Zone in Changzhou and China Development Orient in Beijing served as the partner organizations. As an industrial zone administrative committee and a real estate developer, respectively, they provided the stakeholder engagement necessary to recruit participants and encourage active involvement. Participation of commercial building owners is essential in order to aggregate potential clean energy upgrades and retrofit projects across the buying group's building portfolio. ►



INDEPENDENT FACILITATOR

The facilitator provides independent technical expertise and project management capacity to ensure successful implementation. The primary function of the facilitator is to establish and strengthen the stakeholder network throughout the project lifecycle. The work scope for this role can vary depending on available resources and the desired level of involvement from the stakeholder group. Energy audits and procurement management could be performed by the partner organization or these tasks could be the responsibility of the facilitator. In the case of SEBIZ, Optony Inc. served as the independent facilitator and provided project management capacity, led the stakeholder engagement effort, performed energy audits, identified and pre-screened project opportunities, identified qualified solution providers through an open RFQ process, and facilitated buyers-vendor matchmaking.

SOLUTION PROVIDERS

Qualified clean energy solution providers bring the actual technology solutions to the aggregated projects, including building envelope retrofit materials, efficient equipment upgrades, and on-site renewable energy generation systems. Through the issuance of a request for qualifications or proposals, pre-qualified solution providers can help simplify the process of energy retrofits and upgrades for commercial building owners. By leveraging the aggregated approach, building owners receive individual proposals with group pricing that reflect a bulk purchase discount. Ideally, the offers have integrated financing options or financing partner in order to overcome the upfront cost hurdle.

10-STEP IMPLEMENTATION PROCESS

The following ten steps provide the outline for an integrated approach to distributed clean energy project aggregation from stakeholder engagement to project commissioning:

1. Recruit Commercial Building Owners to Build Portfolio of Participating Facilities
2. Perform Energy Audits and Benchmarking Across Building Portfolio
3. Analyze Energy Data and Identify Project Opportunities
4. Draft Energy Action Reports With Specific Technology Recommendations
5. Issue RFQ on Behalf of Participating Commercial Building Owners
6. Identify “Green Team” of Qualified Clean Energy Solution Providers
7. Facilitate Buyer-Vendor Matchmaking
8. Vendors Perform Follow-Up Site Assessments and Deliver Detailed Proposals
9. Commercial Building Owners Select Compelling Offers Deploy Technologies
10. Commission Projects to Confirm Energy Reductions and Financial Savings

ANNUAL IMPACT POTENTIAL

Initial results of the SEBIZ model in China's Wujin National Hi-Tech Industrial Zone

Initial results of the SEBIZ model in China's Wujin National Hi-Tech Industrial Zone revealed the potential for a 31% reduction in annual electricity usage via high-impact retrofit projects. The 31% reduction represents 16 million GWh, 13,500 tonnes CO₂, and ¥18 million in avoided costs plus incentives each year. The scope of

potential savings was identified across a portfolio of 46 facilities at 11 sites, but only took into account the top three clean energy opportunities. Two LED retrofits have already been implemented for 50-73% reductions in lighting energy use. Additional retrofit opportunities for deeper energy reductions are possible and likely. ■



Wujin National Hi-Tech Industrial Zone, China



Wujin National Hi-Tech Industrial Zone, China

SEBIZ Is Brought to You By:



Optony is a global research and consulting firm focused on enabling government and commercial organizations to bridge the gap between clean energy goals and real-world results. Leveraging our independence, domain expertise and unique market position, our clients are empowered to make informed decisions that reduce risk, optimize operations, and deliver the greatest long-term return on their investments.
www.cleanenergyroadmap.com



SEBIZ is funded through a grant from the US Department of Energy's Office of Energy Efficiency and Renewable Energy (EERE). EERE's International program accelerates the speed and scale of clean energy deployment through international collaboration with strategic partners.

The Sustainable Energy Business Districts (SEBIZ) program is helping to address China's urban energy needs and greenhouse gas emissions at the city-level by leveraging a successful public-private partnership collaboration model in targeted Chinese cities. The program is being implemented by Optony Inc. and funded, in part, by the U.S. Department of Energy.

Using a portfolio approach to energy efficiency and renewable energy technology deployment, SEBIZ provides commercial building owners with technical assistance to identify and pursue viable projects, while helping local governments reach important policy goals.

The SEBIZ team of experts is working with local stakeholders through an innovative collaboration model to provide energy audits, technical assessments, financial analysis, policy evaluation and facilitation of project financing for qualified projects.

For more information, visit www.cleanenergyroadmap.com/sebiz



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