ENERGY EFFICIENCY ASSESSMENTS IN CHINA

中国能源效率评估

On behalf of

Federal Ministry for the Environment, Nature Conservation and Nuclear Safety

of the Federal Republic of Germany

DEG KFW BANKENGRUPPE

Arqum

camco

Content

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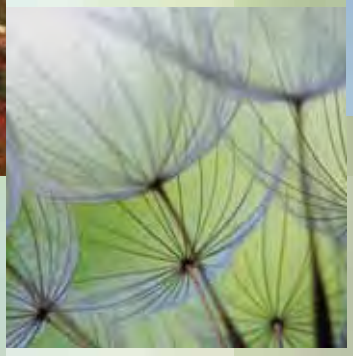

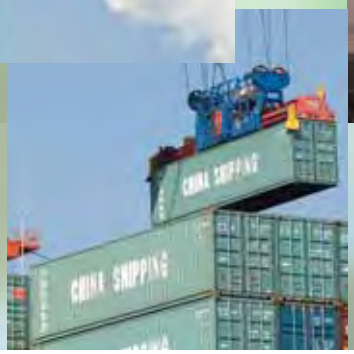

On behalf of

Federal Ministry for the Environment, Nature Conservation and Nuclear Safety

of the Federal Republic of Germany

Germany: a reliable partner for climate protection

A global challenge such as climate change calls for global action. The German Government advocates limiting the rise in the average global temperature to a maximum of 2° C above the pre-industrial level. To achieve this goal, all countries will have to significantly reduce their greenhouse gas emissions and develop a sustainable low-carbon economy. Improving energy efficiency is a key point of leverage. When energy consumption drops, greenhouse gas emissions can be cut. Moreover, this simultaneously reduces local air pollution, improves people's quality of life and strengthens national economies. Particularly in emerging economies such as China, where industry is expanding rapidly and energy demand is rising accordingly, it is vital to deploy modern, efficient technologies and to have the know-how to do so. The German Government works closely with emerging economies and developing countries, assisting them on the path towards low-carbon economies and sustainable energy supply systems. The International Climate Initiative (ICI) launched by the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU) is an integral part of this work.

The International Climate Initiative

Since 2008, the ICI has been financing climate protection projects in developing countries and emerging economies, as well as countries in transition in Central and Eastern Europe. Based on a decision taken by the German parliament (Bundestag), 120 million euros from the auctioning of emission allowances is available for use by the Initiative annually. By means of this innovative financial mechanism, BMU effectively contributes towards emission reduction and adaptation to climate change. This new form of climate cooperation complements the existing development cooperation work of the German Government.

The ICI is active in three areas: promoting climate-friendly economies, fostering measures to adapt to the effects of climate change and ensuring the conservation and sustainable use of natural carbon reservoirs/Reducing Emissions from Deforestation and Forest Degradation (REDD+).

When selecting projects, BMU attaches great importance to developing innovative, multipliable and transferable approaches whose results are maintained long after completion of the project. Targeted cooperation with partner countries provides the ICI with an important impetus for an international climate agreement. The ICI also makes a significant contribution towards the international dialogue on creating a climate change financial architecture.

Achievements to date

Since the ICI was launched in 2008, BMU has initiated 218 projects with funding totalling some 453 million euros (as of 31 December 2010). The projects run for up to five years. Additional capital contributed by the agencies implementing the projects and funding from other public and private-sector sources bring the total funding volume for ICI projects to over 1.2 billion euros.

In China the ICI has promoted 22 projects to date with an overall grant volume of 41.3 million euros. Of these projects, seven have addressed renewable energies and energy efficiency.

The ICI website provides further information about the initiative and profiles all projects: www.international-climate-initiative.com

代表：

联邦环境、
自然保护及核安全部

德意志联邦共和国

德国：气候保护领域中可靠的合作伙伴

诸如气候变化等全球性挑战亟需全世界采取行动。德国政府奉行的政策是将全球平均气温增长幅度限制在工业化之前水平之上2°C之内。为了实现这一目标，世界各国都必须大幅削减其温室气体排放量并发展可持续的低碳经济。改善能源使用效率是至关重要的方面。当能源使用量下降时，就可以削减温室气体排放量。此外，这同时还降低了当地的空气污染、改善了人们的生活质量并提升了各国经济。这对于中国这样的新兴经济体尤为重要，它的工业正在快速扩张，能源需求也随之上涨，因此采用现代化、高效率的技术并掌握其使用方法具有重要意义。德国政府与新兴国家和发展中国家进行了密切合作，以便帮助它们成为低碳经济体并实现可持续的能源供应系统。作为这项工作中不可分割的组成部分，德国联邦政府环境、自然保护及核能安全部（BMU）推出了国际气候动议（ICI）。

国际气候动议

从2008年开始，国际气候动议便对发展中国家、新兴经济体、以及中欧和东欧的转型国家的气候保护项目提供资金。根据德国议会（联邦议会）做出的一项决议，每年将拍卖温室气体排放权获得的1.2亿欧元用于国际气候动议。通过这项创新的金融机制，德国联邦政府环境、自然保护及核能安全部为降低温室气体排放并适应气候变化作出了行之有效的贡献。这项新型气候合作成为德国政府现有的发展合作的重要补充。

国际气候动议在3个领域中发挥了积极作用：发展气候友好型经济、寻找各种措施以适应气候变化所带来的影响，以及确保对自然界碳库的保护与可持续利用/削减因砍伐森林和森林退化导致的温室排放（REDD+）。

德国联邦政府环境、自然保护及核能安全部在选择项目时十分注重发展创新的、多样化的、可照搬使用的方法，以便使其成果可以在项目完成后保持很长时间。通过与合作伙伴国家开展合作，为国际气候动议能够推动签署国际气候协议。国际气候动议还通过为气候变化建立融资框架，对开展国际对话作出了重大贡献。

目前为止所取得的成就

自从2008年推出国际气候动议之后，德国联邦政府环境、自然保护及核能安全部已经开展了218个项目且提供资金总额达到约4.53亿欧元（2010年12月31日的统计结果）。这些项目为期长达5年。若加上实施这些项目的机构的额外出资以及其他公共和私营部门的出资金额，国际气候动议的项目的出资总额超过了12亿欧元。

在中国，国际气候动议目前为止已经开展了22个项目并总共提供了4130万欧元。在这些项目中，有7个项目涉及到可再生能源和能源高效利用。

国际气候动议的网站提供了有关该动议和所有项目档案的更多信息：

www.international-climate-initiative.com

DEG – Our business is developing.

DEG, member of KfW Bankengruppe (KfW banking group), finances investments of private companies in developing and transition countries. As one of Europe's largest development finance institutions, it promotes private business structures to contribute to sustainable growth and improved living conditions.

Founded in 1962, DEG's intention is to contribute to sustainable development and improve people's living standards in our partner countries. We do this by supporting promising entrepreneurial initiative.

DEG invests in profitable projects that contribute to sustainable development in all sectors of the economy, from agriculture to infrastructure and manufacturing to services. We also focus on investments in the financial sector in order to facilitate reliable access to capital locally. To date, we have worked together with more than 1,500 companies and our own financing commitments of more than 11 billion euros have contributed to providing an investment volume of more than 70 billion euros.

Entrepreneurial development cooperation is an important part of development policy: successful, long-term viable private enterprises generate economic growth in the partner countries. They create jobs and income, contribute to improving the countries' foreign exchange balance by producing competitive products, contribute to government revenues by their tax payments and increase national value added by processing local resources.

DEG only takes on commitments in projects that make an effective development policy impact, meet environmental standards and comply with social principles. We are particularly committed to our developmental mandate and our guidelines for social and environmental sustainability: they form the decisive frame of our work.

Promoting resource and especially energy saving in a fast growing economy like China can importantly contribute to climate and environment protection.

Based on our country and industry knowledge as well as our substantial network the idea was born to team up with technical experts to conduct a number of industrial energy efficiency assessments in China. The aim was to identify and explain concrete energy savings opportunities and to clearly show their economic and ecologic benefits in order to support the companies to implement reasonable energy efficiency measures.

We would like to thank the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU) for its support of the energy efficiency assessment project in China and the provision of funding from the International Climate Initiative (ICI).

We also thank our technical consulting partners Camco and Arqum for the fruitful cooperation and all participating companies for their engagement and willingness to improve their environmental impacts.

This brochure not only summarizes the major findings of the energy efficiency assessment project in China. It also shows that the participating companies have started to implement concrete measures.

We would like to encourage all participants to further intensify their environmental and climate protection efforts. Finally, also with the help of this brochure, we would like to motivate others to follow these good examples.

DEG – Deutsche Investitions- und Entwicklungsgesellschaft mbH

Learn more about DEG:
www.deginvest.de

德国投资与开发有限公司—我们的业务正在蓬勃发展。

德国投资与开发有限公司是德国复兴信贷银行集团成员之一，它对发展中国家和转型国家的私营公司的投资提供融资。作为欧洲最大的发展融资机构之一，它提升了私营公司的业务结构，以此为可持续发展和改善生存条件作出了贡献。

本公司始建于1962年，其宗旨是为合作伙伴国的可持续发展和改善人民生存条件做贡献。我们通过对有发展前景的企业动议提供支持来实现这一目标。

就本公司所投资的具有盈利能力的项目而言，它们促进了所在经济体的所有部门的可持续发展，这其中包括农业、基础设施、制造业、服务业等。我们还注重对金融部门的投资，以便帮助当地企业能够更加可靠地获取资本。目前为止，我们已经与1500多家公司展开了合作，我们的融资承诺达到了110多亿欧元，总计提供了700多亿欧元的投资额。

企业发展合作是本公司发展政策中的重要组成部分之一：即为合作伙伴国中成功的、长期的、具有可行性的私营企业创造经济增长。它们创造了就业和收入，通过生产具有竞争力的产品改善了所在国的外汇收支平衡，并且通过纳税和加工当地资源以提升全国产品增值为政府贡献了收入。

本公司仅为特定的项目提供资金，即能够产生重大的发展政策影响、满足环境标准、以及符合社会准则的项目。我们尤其恪守我们的发展宗旨与我们针对社会和环境可持续性的指针：它们构成了我们工作中的决定性框架。

在中国这样一个快速发展的经济体中，通过提高资源、尤其是能源节省状况，就可以大幅改善气候并保护环境。

根据我们对各国和行业的了解以及我们巨大的网络，我们产生了与技术专家携手在中国共同实施多个行业高效利用能源评估的想法。其目标是为了发现并解释切实的能源节省机会并明确地表明它们的经济利益与生态利益，以此支持这些公司实施合理的高效利用能源措施。

我们要向德国联邦政府环境、自然保护及核能安全部（BMU）表示谢意，因为它为在中国开展的能源效率评估项目提供了支持并从国际气候动议（ICI）中提供了资金。

我们还要感谢我们的技术咨询合作伙伴Camco公司与Arqum公司，它们与我方展开了富有成效的合作。我们还要感谢所有参与项目的公司，它们的参与和积极性提高了它们对环境产生的成效。

本宣传册不仅概述了在中国开展的此项能源效率评估项目的主要发现，它还表明参与项目的公司业已开始实施切实的措施。

我们希望鼓励参与各方进一步加大其在保护环境和气候方面的努力。最后，我们希望通过这本宣传册来促使所有人学习这些正面榜样。

DEG——德国投资与开发有限公司

如需了解本公司的更多情况，请登录：

www.deginvest.de

Arqum GmbH

Arqum – Gesellschaft für Arbeitssicherheits-, Qualitäts- und Umweltmanagement mbH is a German consultancy specialising in Environmental, Occupational Health & Safety and Quality Management. Since our formation in 1998, we have advised more than 1,300 organizations in their commitment for a sustainable and quality-driven business.

Our services range from stand-alone activities such as resource efficiency, energy or compliance audits to the implementation of complex projects such as carbon footprints or integrated management systems according to all internationally acknowledged standards such as ISO 9001, ISO 14001, EMAS or OHSAS 18001.

Our work targets at the establishment of internal competencies in our client's organisations promoting sustainable growth in the long run. We achieve this by implementing tailor-made solutions in close cooperation with our clients at every stage of the assignment. Following a hands-on consulting approach is one of the key factors of our success.

Energy efficiency consultancy is one of our key competencies and an important part of our business in China. Since our first projects in China in 2005 we supported more than 60 companies in their aim for increasing their resource and energy efficiency.

As highlighted in this brochure, all 23 companies achieved impressively high savings in energy and CO_2-Emission. We would like to congratulate and thank the participating companies for making this programme such a success!

Learn more about Arqum:
www.arqum.de

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Camco

Camco is a global developer of emission reductions and clean energy projects with operations in China, US, UK, Africa, Russia and Southeast Asia. Camco has a 20 year track record in project development, technical delivery and policy development, working with local industry, multinational companies, governments and regulatory bodies.

Some of our clients include Shell, Conch, Yangquan, HSBC, Aviva, Eli Lilly, Itochu, the EU Commission, United Nations, Carbon Trust, ADB, AWF, SIDA, EPA, and the UK, US, South African and Chinese Governments.

Camco's Clean Energy Project Development and Investment teams collaborate with industry, project developers, equipment providers and investor groups to create emissions-to-energy projects and maximise sustainable energy production across a range of industries; including agricultural methane, industrial energy efficiency, coal mine methane, municipal solid waste, biomass and landfill gas.

The Carbon Project Development business has created one of the largest emission reductions portfolios and has structured groundbreaking and innovative arrangements for the sale and delivery of emission reductions to compliance and voluntary buyers.

The Energy and Carbon Advisory teams provide strategic, commercial and technical expertise accrued over two decades to deliver low carbon energy and sustainable development solutions. The experience of this team spans emissions assessment, carbon management strategies and project delivery, as well as international energy and climate change policy.

Specifically in China, the Advisory team provides due diligence services, including environmental, health safety and social (EHSS), energy efficiency and GHG emission audits. We work for a range of international clients and foreign investors, including DEG, DPG, FMO, Proparco, and UNIDO. The team also specialises in the technical, economic and financial assessment of clean energy technologies, both at the feasibility and post-commissioning stage of development.

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Arqum GmbH

Arqum安全质量环保有限公司是德国的一家职业健康与安全、质量与环境管理咨询公司。自1998年成立以来，我们已受1300多家企业或组织委托，长期提供高质量的咨询意见。

我们的服务范围包括：资源有效利用管理、复杂项目的能源检测、如碳足迹，以及一些常规审核手续，如根据国际标准ISO9001，ISO14001，EMAS或OHSAS 18001认证的综合管理系统。

我们的工作目标是，为我们的客户提供合理建议，以促进其组织内部的长期可持续发展。为实现这一目标，我们会在合作的每一个阶段与我们的客户保持密切的联系，以为其量身定制适合的工作方案。亲力亲为的工作方式是我们成功的关键因素之一。

能源效率咨询是我们的一个工作重点，也是我们在中国业务的重要组成部分。自从2005年来，我们已经为六十多家企业进行咨询工作，以帮助他们提高生产过程中的资源和能源利用效率。

本手册中列出的23家企业在我公司的咨询帮助下全部实现了高效的节能减排的目标。在此，我们要衷心感谢这些合作公司所作出的努力，并对他们的成功表示热烈的祝贺。

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关于Camco

Camco是一家国际化减排及清洁能源项目开发商，在中国、美国、英国、非洲、俄罗斯以及东南亚均设有办公室。在过去的20多年中，Camco与当地工业企业，跨国公司，政府和监管组织就项目开发，技术交付以及政策分析等多方面业务展开合作。

我们的客户包括：壳牌，海螺水泥，阳泉煤业，汇丰银行，英国英杰华集团，美国礼来公司，伊藤忠商事株式会社，欧洲委员会，联合国，碳信托，亚洲开发银行，AWF，瑞典国际开发组织，美国环保局，以及英国，美国，南非和中国政府部门。

Camco的清洁能源项目开发与投资部门与工业企业，项目开发商，设备提供商和投资集团通力合作，致力于多个领域中将排放转换为能源的项目，同时也力图将能源产品的可持续利用扩大到最大程度，包括农业沼气，工业节能，煤层气，市政废物处理，生物质与垃圾填埋气等。

在碳项目开发方面，我们已经成为拥有最大、最全面的减排产品组合，并且在义务和自愿两大市场中的销售及交付均有创新举动。

能源与碳咨询团队的战略，商务，技术精英们在过去的二十年中也不断地为客户提供低碳能源与可持续发展解决方案，同时也包括排放评估，碳管理战略，项目交付和国际能源与气候政策等。

我们在中国市场的咨询业务表现尤为突出，在环境、健康、安全与社会、能效及温室气体排放审计等方面提供尽职报告服务。我们与一系列跨国公司与外商投资者合作，包括：DEG，DPG，FMO，Proparco和UNIDO等。该团队专攻于清洁能源技术的可行性研究及试运行后的开发过程中的技术，经济与财务评估等服务。

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Project description

The Energy Efficiency Assessment (EEA) was conducted in 23 companies. These companies differ considerably in size, consumption of energy, sector of industry and their given infrastructure.

The EEAs started with a preparation phase in which data was collected and analysed for each company. The data was differentiated into general information (number of employees, production output, working days, shift-systems) and consumption data (electricity, natural gas, raw material). Preliminary data analysis provided the opportunity for collection of state of the art examples for the different sector and definition of main target areas in the on-site visits.

The on-site visits were conducted by experts of Camco and Arqum. As a result improvement measures, closer examination of the local conditions and additional collection of necessary data could be identified. The feasibility and savings potential were defined in discussion with the persons in charge.

The last step within the project was the evaluation of further ideas for improvement with the involvement of suppliers of technical solutions. Quotes or cost appraisals were collected, evaluated and used for the calculation of economic feasibility.

The three-step-process resulted in an energy efficiency programme, including concrete measures to reduce the companies' energy consumption. From the variety of all defined measures more than 100 measures were selected and used for interpretation - covering topics such as lighting, compressed air, renewable energies, cooling, heat recovery and others. The calculation of the saving potentials in the different areas of energy saving shows, that energy efficiency pays off economically and reduces green house gas emissions.

Areas Analysed

Heat Integration & Recovery
Check heat integration and waste heat recovery

Energy & Utility Supply
Assess efficiency of energy generation and distribution

Equipment Check
Evaluate large energy consumers by checklists

Operational Improvement
Optimize operational parameters and process control

Process Design Improvement
Check application of innovative technologies

Buildings & Facility
Assess heating, lighting and HVAC

Energy Efficiency Check

Benefits

- Immediate reduction of energy costs
- Increase productivity
- Improve competitiveness
- Enhance product quality
- Lower production risks
- Improve environmental performance
- Contribute to climate protection

Approach

0. Comissioning

1. Preparation (3–4 weeks)

- Preliminary analysis of data (questionnaire)

2. Site visit (3–5 days)

- Analysis of processes & input/output balance
- Identification and ranking of potential measures
- Evaluation of technical feasibility and savings potential

3. Report (2–3 weeks)

- Presentation of solutions
- Conclusions

项目说明

能源效率评估项目（EEA）共针对23家公司开展。这些公司在规模、能耗、行业以及基础设施方面都存在较大的差异。

能源效率评估首先进行的是项目筹备工作，主要是为各家公司收集和分析数据。再将这些数据区分为一般性信息（员工数量、产品产出、工作天数、轮班制度）和消耗数据（电力、天然气、原材料）。初步的数据分析使我们有机会针对不同的行业收集技术发展水平方面的示例，并在现场走访中对主要目标区域加以详细说明。

现场调查工作是由Camco公司与Arqum公司的专家实施的。这样做使我们能够找出改善措施、对当地条件进行更加详细的考察、并额外收集必要的数据。我们在与负责人展开的讨论中已经详细说明了可行性与节约的潜力。

本项目的最后一步是对进一步提高能源使用效率的措施进行评估，这同时涉及到技术解决方案供应商。我们对报价或成本鉴定进行收集、评估，以便计算出经济方面的可行性。

通过采取这个分三步实施的过程，便得出了一套提高能源使用效率方案，这其中包括削减这些公司能源消耗的具体措施。我们从总共一百多种附加详细说明的措施中进行选择并实施——它们涵盖了诸如照明、压缩空气、可再生能源、制冷、余热回收等领域。通过对不同领域的节能的潜力进行计算，证明提高能源使用效率具有经济上的可行性，而且还同时减少了温室气体的排放。

所分析的区域

热量集成与回收
对热量集成与余热回收进行检查

能源与设施供应
对能源产生和分配的效率进行评估

设备检查
根据清单对大型能源消耗设备进行评估

运营改善
对运营参数和过程管理进行优化

过程设计改善
对创新型技术的应用进行检查

建筑物与设施
对发热，照明，以及制热、通风与空调控制系统进行评估

能源效率评估

好处

- 立刻削减能源开支
- 提高生产率
- 提高竞争能力
- 提升产品品质
- 降低生产风险
- 提高环境绩效
- 对气候保护作出贡献

方法

0. 委派

1. 筹备（*3—4周*）

- 对数据进行初步分析

2. 现场调查（*3—5天*）

- 对过程与投入/产出平衡的分析
- 对潜在的措施进行鉴定和分级
- 对技术可行性和节约的潜力进行评估

3. 报告（*2—3周*）

- 提出解决方案
- 结论

Results

100 representative measures were analysed for an overview of the project results. The selected measures are shown on the company pages (pages 14-59).

Overall the outcome of the energy assessments shows potential savings of 763,493,359 kWh or 287,628,918 RMB through energy efficiency measures.

Saving	
Electricity, Natural Gas, other energy sources	763,493,359 kWh
CO_2 emissions	627,212 tons
Energy costs	287,628,918 RMB

Fig. 1 Overall results from energy saving measures

Measures concerning heat and heat recovery make up more than 70% of the saving potential followed by other technical measures with almost 25%. The latter include replacing pumps and motors with more efficient ones, the usage of frequency controls, installing metering systems and using online control for processes and equipment.

Figure 2 shows that apart from technical improvements and heat recovery, many improvements can also be achieved by improvements at the compressed air systems. Renewable energies, especially the use of photovoltaic, result in large savings. A considerable amount of energy can also be saved by implementing simple organisational measures.

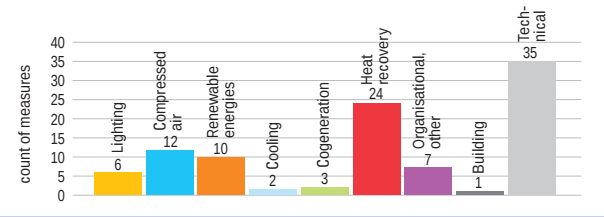


Fig. 2 count of measure by area

Considering the size of the company, companies with less than 250 employees can reach average economic savings of 642,524 RMB through energy efficiency. Savings for companies with 250 to 1,000 employees average 13,423,390 RMB and the average savings for companies with more than 1,000 employees is 24,538,619 RMB.

Savings are reached through new installations and state-of-the-art equipment, which total an investment of 922,723,720 RMB. The results (figure 3) show the immense requirement for investing in energy saving technology.

Invest with payback period below 1 year:	RMB	10,777,620
Invest with payback periods between 1-3 years:	RMB	438,005,900
Invest with a payback period over 3 years:	RMB	473,910,200
Invest with undefined payback period	RMB	30,000
Total Investment	**RMB**	**922,723,720**

Fig. 3 Overview for investment in energy efficient equipment

Figure 4 demonstrates that an investment in new technologies pays off. Approximately 64% of all analysed measures either have a payback period below 3 years or require no financial expenses.

Although the savings achieved through organisational improvements are not as high as in other companies where savings can make up to 10%, substantial savings were experienced and further potential for savings through organisational improvements could be explored.

Especially organisational improvements and measures with a short payback period were already implemented during the course of the project by the participants.

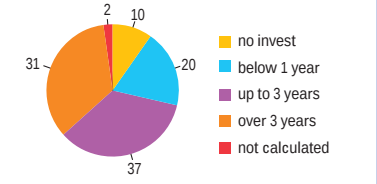


Fig. 4 economical feasibility, number of measures for each payback period

Investing in energy efficiency does not only result in energy savings and economical benefits but also reduces emissions of green house gases like CO_2, which is shown in figure 5. With the analysed measures 627,213 tons of CO_2 emissions can be reduced. The highest reduction of emissions comes in line with technical measures and measures for heat recovery. Considering a per capita emission of 5.1 tons per year (MNP, 2008) the calculated CO_2 reduction is equal to the emissions of 122,983 people in China.

Overall savings, low payback periods and a big CO_2 reduction potential show clearly how beneficial intensive assessments for energy efficiency and the resulting measures are.

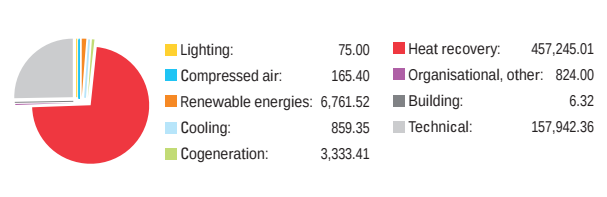


Fig. 5 reduction of CO_2 emissions by area [t]

项目成果：

我们对100项具有代表性的措施进行分析，以便得出项目成果的概要。我们在公司的页码上标明了所选择的措施（页码为14—59）。

能效评估的结果表明，通过采用提高能源利用效率所获得的能源节省潜力为763,493,359千瓦时，相当于287,628,918元人民币。

节省数额	
电力	763,493,359 千瓦时
二氧化碳排放量	627,212 吨
能源成本	287,628,918 元人民币

表1 能源节省措施所产生的总体成果

能源节省潜力中，最大的份额是针对制热和余热回收的措施所产生的，这占到总额的70%以上，其他技术措施则占到近25%比例。这些技术措施如更换了能源利用效率更高的泵和马达、加装变频装置、安装计量系统以及针对生产进程与设备建立在线控制系统。

表2表明，这些措施最主要分布在技术改进和余热回收中。在压缩空气系统领域中也有许多改进措施。

在使用可再生能源领域中也可以实现巨大的能源节省，尤其是通过安装太阳光伏发电装置可以节省高达1200万千瓦时的能源。通过简单的组织措施也可以节省巨大的能源消耗，此领域中的投资较低，因此具有极大的吸引力。

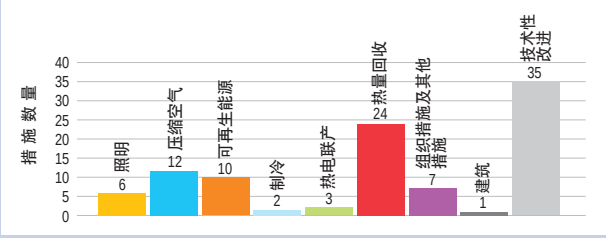


表2 各领域中的措施数量

通过致力于提高能源利用效率来达到节能的目的，由此产生的巨大经济效益也引起了人们的兴趣。根据公司的规模，雇员数低于250人的公司平均可以实现642,524元人民币的节省金额。雇员数介于250至1000人之间的公司平均可以实现13,423,390元人民币的节省金额。雇员数超过1000人的公司平均可以实现24,538,619元人民币的节省金额。

在获得节省金额的同时，也产生了922,723,720元人民币的一次性投资额，这是安装新型技术设备所需要的。这些结果（3）清楚地表明需要对节能技术进行巨大的投资。

收回成本时间低于1年的投资：	¥	10,777,620
收回成本时间为1—3年的投资：	¥	438,005,900
收回成本时间超过3年的投资：	¥	473,910,200
收回成本时间无法确定的投资	¥	30,000
总投资额	**¥**	**922,723,720**

表3 对提高能源使用效率的设备所进行的投资概要

表4中列出了对新技术的这笔投资所产生的经济回报。对于我们所分析的措施而言，收回成本的时间对于每一家公司都具有吸引力。在所分析的措施中，大约有64%的比例是在3年之内收回成本或是根本无需任何财务支出。

虽然其他组织的经验表明，可以通过企业组织改进实现高达10%的能源节省比例，但是在能源利用效率评估中却未发现此类巨大的节省额。

在本项目中，组织方面的措施所产生的节省额与其他的措施相比幅度较低，但是这些措施的数量和所带来的改进效果还是较高的。在本项目实施过程中，参与各方业已采用收回成本时间较短的组织工作方面的改进措施。

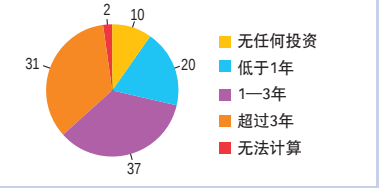


表4
经济上的可行性及每一项收回成本时间所对应的措施数量

对提高能源利用效率方面的投资不仅会节省能源并产生经济效益，而且还能削减诸如二氧化碳等温室气体的排放，参见表5。就我们所分析的措施而言，它们能够降低627,213吨二氧化碳排放量。降低排放量比例最大的依然是技术措施和热量回收措施。考虑到每年人均排放数量为5.1吨（荷兰环境评估局2008年的统计结果），所产生的排放削减量相当于中国122,983人的排放量。

全面的能源节省、短暂的成本收回时间以及巨大的二氧化碳削减潜力，这些都明确地表明对能源利用效率进行集中的评估和采取改进措施能带来的巨大好处。

表5 各领域所削减的二氧化碳排放量[单位：吨]

Balluff Sensors (Chengdu) Co., Ltd.

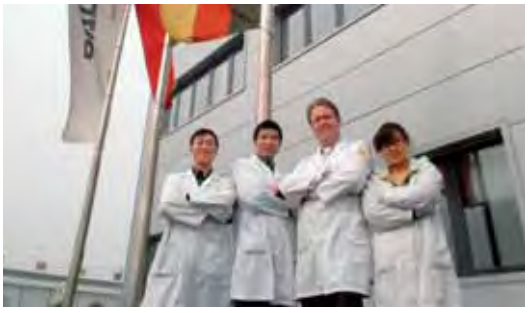
Balluff Sensors (Chengdu) Co., Ltd.
No. 359 Baiyun road, Xindu district, Chengdu
610500 Chengdu

Contact Person:

Erik Oortwijn	General Manager
Phone:	+86 28 8395 8121 (8230)
Fax:	+86 28 8395 8068
E-mail:	erik.oortwijn@balluffsensors.com.cn
Website:	www.balluffsensors.com.cn

Founding year:	2004
Employees on site:	120
Sector:	Electromechanical switches, Inductive switches, transducers

With over 40 years of experience, Balluff GmbH is a world leading manufacturer of sensor solutions with headquarters in Germany. Sophisticated reliable technology and the most modern electronics, specific customer solutions and first-class service are the hallmarks of our company. The world-class assembly centre of Balluff Sensors (Chengdu) is producing detection- and positioning sensors for customers all over the world, and delivering excellent service specifically for the Asian market.



The Balluff-BCS-EHS team

Resource Efficiency Programme

Measure	Type	Payback Period [years]	Invest [RMB]	Savings [RMB/a]	Energy Savings [kWh/a]	CO_2 Savings [t CO_2/a]
Installation of high efficient T5 tubelights	Lighting	2.1	9,000	4,160	3,780	3.18
Installation of photovoltaic modules to produce electricity	Renewable energy	20.7	6,250,000	302,500	275,000	231.69
Leakage detection at compressed air system	Compressed air	0	0	6,200	5,600	4.72
Recovery of waste heat from compressor	Heat recovery	1.4	3,000	2,100	1,900	1.60
		Total	**6,262,000**	**314,960**	**286,280**	**241.19**

巴鲁夫传感器（成都）有限公司

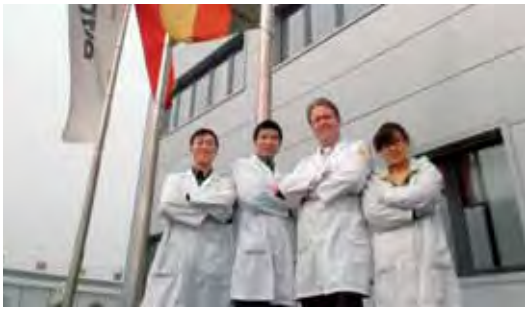
巴鲁夫传感器（成都）有限公司
成都市新都区白云路359号
610500 成都

项目联系人：

Erik Oortwijn	总经理
电话：	+86 28 8395 8121 (8230)
传真：	+86 28 8395 8068
邮件地址：	erik.oortwijn@balluffsensors.com.cn
公司主页：	www.balluffsensors.com.cn

成立时间：	2004
员工数量：	120
产品领域：	机电传感器，电子传感器， 微脉冲位移传感器

巴鲁夫公司是一家全球领先的传感器制造商。这家拥有40年生产经验的公司总部设在德国。精密可靠的技术，现代化的电子产品以及详尽的解决方案和一流的服务都是公司的品牌标志。巴鲁夫传感器（成都）公司是为世界各地的客户提供探测和定位传感器的世界级装配中心，同时也为亚洲市场提供优质的服务。



巴鲁夫BCS-EHS小组

资源利用效率提高计划

改进措施	类型	回报期限（年）	支出（元）	节省支出（元/年）	节能（千瓦时/年）	二氧化碳减排量（吨/年）
安装更加高效的T5灯管	节能照明	2.1	9,000	4,160	3,780	3.18
安装屋顶光伏发电装置	可再生能源利用	20.7	6,250,000	302,500	275,000	231.69
定期检查压缩空气泄露情况以降低能耗	压缩空气节能	0	0	6,200	5,600	4.72
对空压机余热加以回收	余热回收	1.4	3,000	2,100	1,900	1.60
		总计	**6,262,000**	**314,960**	**286,280**	**241.19**

Beijing DQY Agricultural Technology Co., Ltd.

Beijing DQY Agricultural Technology Co., Ltd.
Floor 5, Kehaifulin Building, No.12 Zhongguancun,
South Avenue, Haidian District
100081 Beijing

Leo Liu
Technology Director

Phone:	+86 10 62142681
Fax:	+86 10 62142681
E-mail:	liuxuming@dqy.com.cn
Website:	www.dqy.com.cn

Founding year:	2002
Employees on site:	300
Sector:	Food and drinks, Eggs, Layer farming, Biogas Power

Beijing DQY agricultural technology Co., Ltd. (Beijing DQY) is an eco-agricultural enterprise providing consumers with chicken eggs and clean energy. DQY ecological farm is located in Beijing Songshan National Nature Reserve and has 3 million layers making it the biggest layer farm in Asia. Renewable electricity is generated by combusting biogas which is recovered from the chicken waste. Beijing DQY has a registered capital of RMB 4.2386 million and has had a market share of up to 68% in Beijing.

Biogas-digestors and storage tank

Resource Efficiency Programme

Measure	Type	Payback Period [years]	Invest [RMB]	Savings [RMB/a]	Energy Savings [kWh/a]	CO_2 Savings [t CO_2/a]
Use waste heat from flue gas to heat egg cleaning water to 54-58° C	Heat recovery	1.0	1,500,000	1,570,197	3,801,350	1,014.05
Use power plant waste heat to provide heating/hot water in winter	Heat recovery	5.1	1,500,000	296,000	861,923	293.48
Install more solar PV	Renewable energy	6.6	15,000,000	2,286,295	2,628,000	2,582.14
Install more solar water heaters	Renewable energy	4.1	4,500,000	1,085,529	2,628,000	701.05
Install M&T system. Add metering (e.g. to flue stack)	Organisational, others	1.7	150,000	87,788	142,866	83.19
		Total	**22,650,000**	**5,325,809**	**10,062,139**	**4,673.91**

德清源农业科技股份有限公司

德清源农业科技股份有限公司
北京市海淀区中关村南大街12号
科海福林大厦五层
100081 北京

刘旭明
技术总监

电话：	0086-(0)10-62142681
传真：	0086-(0)10-62142681
邮件地址：	liuxuming@dqy.com.cn
公司主页：	www.dqy.com.cn

成立时间：	2002
员工数量：	300
产品领域：	食品，蛋鸡养殖

北京德庆源是一家生产鸡蛋和清洁能源的生态农业企业，在北京松山拥有亚洲最大的生态园，面积达到三百万亩。通过将养鸡场废弃物通过发酵产生沼气用来发电。德庆源在北京市场占有率达到68%，注册资金4238600元人民币。

沼气池和储罐

资源利用效率提高计划

改进措施	类型	回报期限（年）	支出（元）	节省支出（元/年）	节能（千瓦时/年）	二氧化碳减排量（吨/年）
利用烟气余热加热清洗鸡蛋水温到54-58度	余热回收	1.0	1,500,000	1,570,197	3,801,350	1,014.05
在冬季利用动力厂废热提供厂用热水	余热回收	5.1	1,500,000	296,000	861,923	293.48
增加更多的太阳能受热面	可再生能源利用	6.6	15,000,000	2,286,295	2,628,000	2,582.14
增加更多的太阳能热水器	可再生能源利用	4.1	4,500,000	1,085,529	2,628,000	701.05
安装管理控制系统，增加表记	组织管理及其它	1.7	150,000	87,788	142,866	83.19
		总计	**22,650,000**	**5,325,809**	**10,062,139**	**4,673.91**

Burgmann Dalian Ltd.

Burgmann Dalian Ltd.
No. 86 Liaohe East Road, DD Port
116620 Dalian

Yi Ni
HSE liason

Phone:	+86 411 87581374
Fax:	+86 411 87581397
E-mail:	ni.yi@cn.eagleburgmann.com
Website:	www.eagleburgmann.com

Founding year:	1997
Employees on site:	151
Sector:	Mechanical seals

Burgmann Dalian was founded in 1997 as a subsidiary of Eagle-Burgmann Germany GmbH & Co. of Wolfratshausen/Germany and has since then succeeded in firmly establishing itself in the market. The company adapts high and advanced technology of mechanical seal and its supply system from BURGMANN, and serving for thermal power station, Nuclear power station, petro-chemical, oil, chemical, refinery, marine, sugar and pulp & paper industries etc. We also produce special seal design for all kinds of rotating equipments such as centrifugal compressors, high pressure agitators, centrifuges and mixers etc. We also produce filters, separators, coolers, buffer fluid units and magnet couplings etc. used in supply systems.

Project team from left to right: Mr. Yuyong Song, Mr. Chuang Tian, Mr. Yuqi Fu, Mr. Qi Gao

Resource Efficiency Programme

Measure	Type	Payback Period [years]	Invest [RMB]	Savings [RMB/a]	Energy Savings [kWh/a]	CO_2 Savings [t CO_2/a]
Instalation of CFLs and efficient T5 tubelights with electronic ballasts	Lighting	2.5	55,300	22,000	11,000	9.27
Installation of photovoltaic modules to produce electricity	Renewable energy	11.4	7,500,000	660,000	330,000	278.03
Recovery of waste heat from compressor	Heat recovery	10.9	60,000	5,500	11,000	2.22
Installation of VSD on compressor	Compressed air	3.2	50,000	15,600	7,800	6.57
Leakage detection and installation of pressure reduced air guns at compressed air system	Compressed air	0.2	6,000	27,000	13,500	11.37
		Total	**7,671,300**	**730,100**	**373,300**	**307.46**

大连博格曼有限公司

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中国大连市双D港辽河东路86号
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邮件地址：	ni.yi@cn.eagleburgmann.com
公司主页：	http://www.eagleburgmann.com/

成立时间：	1997
员工数量：	151
产品领域：	机械密封

大连博格曼有限公司成立于1997年，属德国伊格尔博格曼股份有限公司的子公司，主要为火电站、核电站、石油化工、油田开采、化工、冶炼厂、造船、制糖和造纸等行业提供机械密封产品的设计制造和服务，并对旋转机械设备提供各种特殊设计的密封，如：离心式压缩机、高压反应釜、离心机和搅拌器等。同时还生产用于密封辅助系统的过滤器、分离器、冷却器、密封系统工作站和磁力驱动连轴器等。

从左到右依次是：宋玉勇（生产计划员）、田闯（机加工车间主任）、付玉齐（生产部长）、高崎（生产计划员&专员）

资源利用效率提高计划

改进措施	类型	回报期限（年）	支出（元）	节省支出（元/年）	节能（千瓦时/年）	二氧化碳减排量（吨/年）
替换原有的金属卤素灯以及安装T5灯管和电子镇流器	节能照明	2.5	55,300	22,000	11,000	9.27
安装屋顶光伏发电装置	可再生能源利用	11.4	7,500,000	660,000	330,000	278.03
回收空压机余热	余热回收	10.9	60,000	5,500	11,000	2.22
安装空压机变频装置	压缩空气节能	3.2	50,000	15,600	7,800	6.57
定期检查压缩空气泄露情况并相应降低气动枪压力	压缩空气节能	0.2	6,000	27,000	13,500	11.37
		总计	**7,671,300**	**730,100**	**373,300**	**307.46**

China Taisan Technology Group Holdings Ltd.

China Taisan Technology Group Holdings Ltd.
Dong Cheng Zhen Dong Development Area, Dong Shi Town,
Jin Jiang City, Fujian Province
362271 Jin Jiang City

Yina Cai
Assistant

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E-mail:	lianjie@china-taisan.com
Website:	www.china-taisan.com

Founding year:	1996
Employees on site:	500
Sector:	Textiles (knitted fabric, top grade fabric, multifunctional fabric)

Listed on the Singapore Exchange, China Taisan Technology Group Holdings Limited specializes in the production of knitted performance fabrics, which are used mostly in high- and mid-end sportswear and casual wear. Polyester fibre is combined with spandex (for enhanced elasticity) and knitted with the weft-knitting technique. It is then treated with chemicals to produce fabrics with different functionalities. The Group's production facility is located in Jinjiang City, Fujian Province.

Jin Yating (Camco)

Resource Efficiency Programme

Measure	Type	Payback Period [years]	Invest [RMB]	Savings [RMB/a]	Energy Savings [kWh/a]	CO_2 Savings [t CO_2/a]
Install steam inlet temp. and pressure meter on drying machines	Technical	0.3	100,000	322,642	4,219,890	1,436.87
Recover heat from drying machine, hot water for staff quarters	Heat recovery	1.5	300,000	193,585	2,531,934	862.12
Seal tumbling doors	Technical	0.3	100,000	322,642	4,219,890	1,436.87
Install sensors and Variable Speed Drive on transmission belt	Technical	0.3	200,000	637,219	981,319	847.86
Installation of monitoring and control system	Organisational, others	1.0	200,000	191,972	1,040,242	456.95
		Total	**900,000**	**1,668,061**	**12,993,275**	**5,040.66**

中国泰山科技集团控股有限公司之子公司
晋江连捷纺织印染实业有限公司

中国泰山科技集团控股有限公司之子公司
晋江连捷纺织印染实业有限公司
晋江市东石镇东埕振东开发区
362271 晋江市

蔡艺娜
助理
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传真：：0595-85587422
邮件地址：lianjie@china-taisan.com
公司主页：www.china-taisan.com

成立时间：	1996
员工数量：	500
产品领域：	纺织，针织布， 高档织物面料，多功能面料

作为一家新加坡上市公司，中国泰山科技集团控股有限公司专注于高性能的针织胚布上，该针织胚布多用于制作高中端体育及休闲服饰。涤纶纤维是利用斯潘德克斯弹性纤维（高弹性）为原材料，运用纬编的编制技术而生产的。此后，该纤维还用于添加化学物质以生产不同功能的纤维。该集团的生产工程位于福建省晋江。

靳雅婷 (Camco)

资源利用效率提高计划

改进措施	类型	回报期限（年）	支出（元）	节省支出（元/年）	节能（千瓦时/年）	二氧化碳减排量（吨/年）
安装仪表对染机蒸汽入口温度压力进行检测。如有能量损失，加装换热器，合理利用蒸汽压力和温度差，以达到节煤目的。	技术手段	0.3	100,000	322,642	4,219,890	1,436.87
回收利用烘干机余热，为职工宿舍提供热水，节约用煤。	余热回收	1.5	300,000	193,585	2,531,934	862.12
维修部分摇粒机门，恢复其运行时的密封程度	技术手段	0.3	100,000	322,642	4,219,890	1,436.87
为传输皮带安装传感器和变频器，运，载货物少或无时，低速甚至停止运行	技术手段	0.3	200,000	637,219	981,319	847.86
安装监测和控制系统	组织管理及其它	1.0	200,000	191,972	1,040,242	456.95
		总计	**900,000**	**1,668,061**	**12,993,275**	**5,040.66**

Edwin McAuley Electronics Ltd.

Edwin McAuley Electronics Ltd.
Nanchang Industrial Area, Wangniudun Town,
Dongguan City, Guangdong Province
523203 Dongguan

Sammy Wong
Chief Executive Officer

Phone:	+86 852 2562 0886
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E-mail:	sammy.wong@emehk.com.hk
Website:	www.emehk.com
Founding year:	1973
Employees on site:	1,500
Sector:	Electrical appliance, consumer electronics

EME is an Original Design & Manufacture (ODM) resource for international brand leaders. EME specializes in energy, water, comfort, safety and well-being products, including electronic irrigation controllers, heating & air-conditioning controls, interactive displays, advanced algorithmic appliance controls, and RF property and personal security systems. The company was founded in 1973 and the manufacturing campus at Wang Niu Dun, Dongguan, opened in 2003.

Camco team: Robin Murray and Gina Liu

Resource Efficiency Programme

Measure	Type	Payback Period [years]	Invest [RMB]	Savings [RMB/a]	Energy Savings [kWh/a]	CO_2 Savings [t CO_2/a]
Install Energy Management system and extra electricity submeters	Organisational, others	1.0	120,000	120,400	143,055	97.75
Replace old compressor plant with more efficient systems	Compressed air	4.6	130,000	28,537	32,375	25.20
Install 'energair' advanced compressor control and sequencing	Compressed air	2.0	80,000	39,637	44,968	35.00
Reduce compressor system pressure, from 8 bar to 7 bar = 12% energy saving	Compressed air	0	0	36,280	41,160	34.82
Waste heat recovery on diesel generator flue stack	Heat recovery	0	30,000	0	0	0
		Total	**360,000**	**224,854**	**261,558**	**192.77**

梦奥利电子有限公司

梦奥利电子有限公司
东莞市望牛墩镇南昌工业区
亨域工业园
523203 东莞

Sammy Wong
首席执行官

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传真：	0086-769 8885 9416
邮件地址：	sammy.wong@emehk.com.hk
公司主页：	www.emehk.com

成立时间：	1973
员工数量：	1500
产品领域：	电器，电子消费品

EME是一家为国际知名品牌提供产品委托设计制造的企业。尤其在能源，水，舒适，安全与健康产品，包括电子灌溉控制系统、制热&空调控制、交互式展示、先进的算法控制装置，以及无线电频率资产管理与个人安全系统等产品均有突出表现。该公司于1973年成立，工厂位于广东东莞望牛墩，于2003年开业。

从左到右：罗斌、刘娜

资源利用效率提高计划

改进措施	类型	回报期限（年）	支出（元）	节省支出（元/年）	节能（千瓦时/年）	二氧化碳减排量（吨/年）
安装能源管理系统及更多的电子仪表	组织管理及其它	1.0	120,000	120,400	143,055	97.75
用更节能的系统更换旧压缩机	压缩空气节能	4.6	130,000	28,537	32,375	25.20
安装 先行控制序列的压缩机‘energair’	压缩空气节能	2.0	80,000	39,637	44,968	35.00
降低压缩机系统压力–从8巴降至7巴=节约12% 能源	压缩空气节能	0	0	36,280	41,160	34.82
柴油发电机烟道余热回收	余热回收	0	30,000	0	0	0
		总计	**360,000**	**224,854**	**261,558**	**192.77**

Freudenberg Household Products (Suzhou) Co., Ltd.

Freudenberg Household Products (Suzhou) Co., Ltd.
No.1720 Binhe Road
215011 Suzhou

Frank Huang
Production Manager
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Fax: +86 512 6824 3340
E-mail: frank.huang@fhp-ww.com
Website: www.vileda.com

Founding year: 1998
Employees on site: 103
Sector: Household products

Looking back on about 60 years of experience Vileda® is one of the international well-known and leading brands beside O'Cedar® and Wettex®. The Freudenberg Household Products' activities are divided into the Consumer Division (some 85% of sales) and the Professional Division. FHP is a subsidiary of the Freudenberg Group, a privately owned German company. For the full year 2009, sales were 626.8 million Euros (2008: 656.3 million Euros). Freudenberg Household Products in Suzhou China manufactures household cleaning products under Vileda® brand. The aim is to help consumers to do housework more effectively and more conveniently, and allows consumers to spend more time on more important things in their life. Vileda® products are widely distributed in hypermarkets and supermarkets.

Project coordinator

Resource Efficiency Programme

Measure	Type	Payback Period [years]	Invest [RMB]	Savings [RMB/a]	Energy Savings [kWh/a]	CO_2 Savings [t CO_2/a]
Not necessary lamps to be switched off	Lighting	0	0	5,800	4,143	3.49
Installation of photovoltaic modules to produce electricity	Renewable energy	16.2	4,250,000	261,800	187,000	157.55
Reduction of pressure level in compressed air system	Compressed air	0	0	130	93	0.08
Training for proper usage of compressed air	Compressed air	0	0	40	29	23.20
Change windows with heat insulated glass	Building	3.8	40,000	10,500	7,500	6.32
		Total	**4,290,000**	**278,270**	**198,765**	**190.64**

科德宝家居用品(苏州)有限公司

科德宝家居用品(苏州)有限公司
苏州新区滨河路1720号
215011 苏州

黄晨
生产经理

电话：	+86 512 6824 8820
传真：	+86 512 6824 3340
邮件地址：	frank.huang@fhp-ww.com
公司主页：	http://www.vileda.com

成立时间：	1998
员工数量：	103
产品领域：	家居用品

在过去的大约六十年中，微力达（vileda®）与O'Cedar®和Wettex®都是国际知名的领军品牌。科德宝家居用品有限公司是德国科德宝集团名下的子公司，其产品主要分为消耗品部门（占营业额的85%左右）和专业产品部门。至2009年底，公司营业额已达6.27亿欧元（2008年6.56亿欧元）。

中国科德宝家居用品（苏州）有限公司的微力达产品主要为家居清洁产品，旨在帮助消费者更有效方便地做家务，以节省时间去做更重要的事。如今，微力达的产品已遍及国内各大商场和超市。

项目联系人

资源利用效率提高计划

改进措施	类型	回报期限（年）	支出（元）	节省支出（元/年）	节能（千瓦时/年）	二氧化碳减排量（吨/年）
关闭不必要使用的灯源	节能照明	0	0	5,800	4,143	3.49
安装屋顶光伏发电装置	可再生能源利用	16.2	4,250,000	261,800	187,000	157.55
合理降低空压机压力	压缩空气节能	0	0	130	93	0.08
对合理使用压缩空气进行人员培训	压缩空气节能	0	0	40	29	23.20
改装隔热玻璃	建筑节能	3.8	40,000	10,500	7,500	6.32
		总计	**4,290,000**	**278,270**	**198,765**	**190.64**

Hoppecke Battery Systems (Wuhan) Co., Ltd.

Hoppecke Battery Systems (Wuhan) Co., Ltd.
Tian Yuan Street No 9, Dongxihu District
430040 Wuhan

Yan Li
General Manager Assistant

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Website:	www.hoppecke.com

Founding year:	1927, Factory in Wuhan: 2005
Employees on site:	350
Sector:	Energy Supply, Industrial Lead Acid Batteries

Hoppecke was founded in Germany in 1927 and develops and produces energy storage systems. As a multinational company Hoppecke offers a range of energy storage products and services. Hoppecke set up a new factory in Wuhan, China, in 2005.

Camco team: Perry Liu and Robin Murray

Resource Efficiency Programme

Measure	Type	Payback Period [years]	Invest [RMB]	Savings [RMB/a]	Energy Savings [kWh/a]	CO_2 Savings [t CO_2/a]
Battery curing & drying exhaust gas heat recovery	Heat recovery	2.0	150,000	73,339	301,930	60.98
Battery case drying furnace heat recovery	Heat recovery	2.2	20,000	8,890	36,598	7.39
Formation drying furnace heat recovery	Heat recovery	4.5	20,000	4,445	18,299	3.7
Optimize lead feeding speed according to the mass and temperature in lead mill	Technical	3.1	100,000	32,782	45,547	43.02
Change lead melting process and cutting machine	Technical	2.6	300,000	114,735	159,416	150.56
		Total	**590,000**	**234,191**	**561,790**	**265.64**

荷贝克电源系统（武汉）有限公司

荷贝克电源系统（武汉）有限公司
田园街9号东西湖区
430040 武汉

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总经理助理
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公司主页： www.hoppecke.com

成立时间： 始于1927年。并于2005年在武汉开设新工厂
员工数量： 350
产品领域： 能源供应，工业铅酸蓄电池

早在1927年，荷贝克创始于德国，当时生产电源系统。作为一家国际化公司，荷贝克提供与电源系统相关的一系列产品及服务。并于2005年在中国武汉开设了一家新工厂。

Camco团队从左到右：刘鹏、罗斌

资源利用效率提高计划

改进措施	类型	回报期限（年）	支出（元）	节省支出（元/年）	节能（千瓦时/年）	二氧化碳减排量（吨/年）
固化加热仓改造 热回收利用	余热回收	2.0	150,000	73,339	301,930	60.98
壳体干燥炉 热回收	余热回收	2.2	20,000	8,890	36,598	7.39
化成干燥炉 热回收	余热回收	4.5	20,000	4,445	18,299	3.7
根据铅粉机温度质量 控制送铅速度	技术手段	3.1	100,000	32,782	45,547	43.02
改造融铅工艺 及切割机	技术手段	2.6	300,000	114,735	159,416	150.56
		总计	**590,000**	**234,191**	**561,790**	**265.64**

Jiangxi Chenming Paper Co., Ltd.

Jiangxi Chenming Paper Co., Ltd.
Baishuihu Industry Park, Nanchang Economic & Technical Development Zone, Jiangxi Province
330013 Nanchang

Morgan Moodley
Chief Financial Officer

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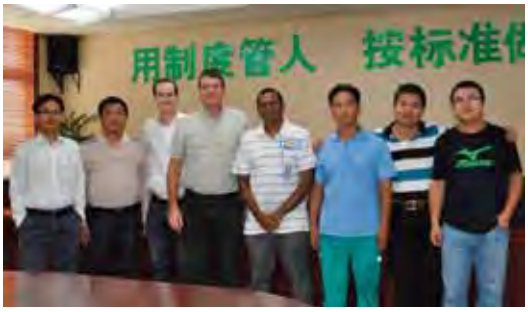
E-mail:	morgan.moodley@sappi.com
Website:	www.sappi.com

Founding year:	2001
Employees on site:	850
Sector:	Pulp and Paper

Jiangxi Chenming Paper Co., Ltd. (JXCM) is located near Nanchang in Jianxi Province. JXCM is a fully integrated pulp and paper mill, producing its own pulp on-site. Steam and electricity are also produced on-site by a 100 MW coal-fired co-generation power plant. JXCM has a Bleached Thermo Mechanical Pulping (BTMP) plant, a De-inking Pulp (DIP) plant and a Light Weight Coated (LWC) Paper Machine capable of producing 350,000 tonnes of paper per annum. JXCM's Pulp Board Machine is capable of producing 120,000 tonnes of pulp per annum. In addition to the pulp produced on-site, JXCM purchase around 3,000 tons of long-fibre Northern Bleached Softwood Kraft (NBSK) pulp per month.



From left: Wei Yongning, Rao Shi Jing, Robin Murray (Camco), Tim Jeffries (Camco), Morgan Moodley, Mr Li, Horace Feng (Camco) and Alex Liang (Camco)

Resource Efficiency Programme

Measure	Type	Payback Period [years]	Invest [RMB]	Savings [RMB/a]	Energy Savings [kWh/a]	CO_2 Savings [t CO_2/a]
Supply heat to office area, save wasted condensed steam	Cogeneration	2.6	250,000	97,240	170,000	160.56
Utilise waste heat and pressure from desuper heater, Convert vacuum pumps, Installing steam driven motors	Heat recovery	0.3	4,000,000	11,499,602	20,104,200	18,987.41
Add Variable Speed Drive (VSD) to large water pump	Technical	2.1	1,000,000	473,513	827,820	781.83
Upgrade blade design on all mains water pumps	Technical	4.5	750,000	166,585	291,233	275.05
Add VSD to one screw air compressor blower unit in waste water plant	Technical	0.2	300,000	1,791,504	3,132,000	2,958.02
		Total	**6,300,000**	**14,028,445**	**24,525,253**	**23,162.88**

江西晨鸣纸业有限责任公司

江西晨鸣纸业有限责任公司
中华人民共和国江西省
南昌市南昌经济技术开发区白水湖工业园区
330013 中华人民共和国江西省南昌市南

Morgan Moodley
财务总监

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公司主页：	www.sappi.com

成立时间：	2001 (TBC)
员工数量：	850
产品领域：	纸浆和造纸

江西晨鸣纸业位于江西省南昌市郊。是一家综合的纸浆及造纸生产企业，可以独立制浆供应生产。生产用蒸汽和电力也是来自于自备的热电联产机组。江西晨鸣纸业有一条BTMP，一条DIP和一条LWC生产线，年产量为35万吨，江西晨鸣纸业的浆板车间年产量为12万吨浆板。每月购买大约3000吨NBSK浆板。

江西晨鸣纸业有限责任公司，从左到右依次为：Wei Yongning, 饶士经， 罗斌 (Camco), Tim Jeffries (Camco), Morgan Moodley, 李先生， 房力强 (Camco) 和 梁永志 (Camco)

资源利用效率提高计划

改进措施	类型	回报期限（年）	支出（元）	节省支出（元/年）	节能（千瓦时/年）	二氧化碳减排量（吨/年）
给办公区域，招待所和职工公寓提供蒸汽供热，	热电联产	2.6	250,000	97,240	170,000	160.56
利用蒸汽废热和废压，安装蒸汽驱动装置用来替换6台真空泵 (3*350KW,3*500KW) 的电机	余热回收	0.3	4,000,000	11,499,602	20,104,200	18,987.41
为大泵增加变频电机	技术手段	2.1	1,000,000	473,513	827,820	781.83
改进所有电机的叶片设计"	技术手段	4.5	750,000	166,585	291,233	275.05
给螺旋空压机增加变频装置	技术手段	0.2	300,000	1,791,504	3,132,000	2,958.02
		总计	**6,300,000**	**14,028,445**	**24,525,253**	**23,162.88**

Kardan Water International (Beijing) Management Co., Ltd.

Kardan Water International (Beijing) Management Co., Ltd.
Ste. 809, Hyundai Motor Tower, No. 38 Xioayun Road,
Chaoyang District
100027 Beijing

Robin Li
Executive Assistant to CEO

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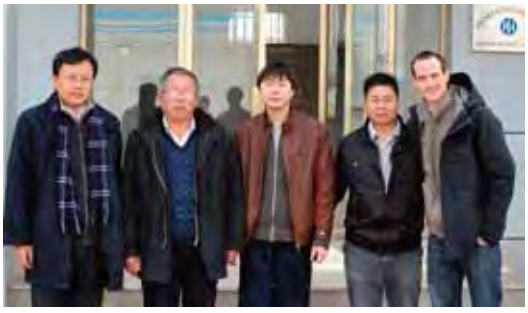
E-mail:	robin.li@kwigwater.com
Website:	www.kwigwater.com

Founding year:	2007
Employees on site:	19 (Tanggu Site), 20 (Boshan Site) and 19 (Huantai)
Sector:	Water Treatment

Kardan Water International Group (KWIG) is the operational platform of TAHAL Group in the Chinese market. KWIG develops, operates and invests in water related projects in Mainland China, focusing on water treatment and waste water treatment, as well as water reclamation and desalination. Kardan owns and operates nine projects across four provinces and has established partnerships with local governments.



From left: Prof. Li Zifu (Camco), Kardan employee, Huantai WWTP Manager, Chen Funsun (Kardan), Robin Murray (Camco)

Resource Efficiency Programme

Measure	Type	Payback Period [years]	Invest [RMB]	Savings [RMB/a]	Energy Savings [kWh/a]	CO_2 Savings [t CO_2/a]
Installing Variable Frequency Drive (VFD) and controls on blower	Technical	1.1	480,000	428,343	586,950	576.71
Optimize flow with controls, add VFD to main duty pump	Technical	2.1	280,000	135,620	184,275	181.06
Adjust count of UV lamps according to the water flow	Technical	0	0	64,126	87,066	85.55
Optimise aeration tank	Technical	TBC	TBC	107,085	146,739	144.18
Install M&T (Monitoring and Targeting) Software system	Organisational, others	1.5	200,000	132,427	179,751	176.61
		Total	**960,000**	**867,601**	**1,184,781**	**1,164.11**

凯丹水务国际集团

凯丹水务国际集团
北京市朝阳区霄云路38号
现代汽车大厦809室
100027 北京

李雪飞
市场总监

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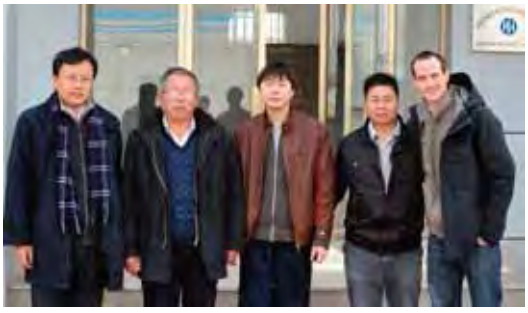
邮件地址：	robin.li@kwigwater.com
公司主页：	www.kwigwater.com

成立时间：	2007
员工数量：	19（塘沽污水处理厂）， 20（博山污水处理厂）， 19（桓台污水处理厂）
产品领域：	水处理

凯丹水务国际集团是以色列泰合集团在华业务发展平台，负责投资、开发和运营中国大陆地区各类水务项目，主要集中在制水供水、污水处理、中水回用和脱盐淡化领域。凯丹水务国际集团在中国目前已在4个省拥有9家项目公司，成为中国政府可靠的长期合作伙伴，为中国的清洁可持续发展提供支持。



从左到右依次为: Li Zifu教授 (Camco), Kardan employee, Huantai WWTP Manager, Chen Funsun (Kardan), 罗斌 (Camco)

资源利用效率提高计划

改进措施	类型	回报期限（年）	支出（元）	节省支出（元/年）	节能（千瓦时/年）	二氧化碳减排量（吨/年）
鼓风机上安装变频装置，安装自动控制系统监测DO水平	技术手段	1.1	480,000	428,343	586,950	576.71
增加变频装置	技术手段	2.1	280,000	135,620	184,275	181.06
可以根据进水流量调节紫外灯数量	技术手段	0	0	64,126	87,066	85.55
曝气池优化	技术手段	TBC	TBC	107,085	146,739	144.18
安装监测和控制系统	组织管理及其它	1.5	200,000	132,427	179,751	176.61
		总计	**960,000**	**867,601**	**1,184,781**	**1,164.11**

Linyi Sanyuan Steel Pipe Industry Co., Ltd.

Linyi Sanyuan Steel Pipe Industry Co., Ltd.
LuoZhuang Tang Zhuang Industrial Park,
Shandong Province
276019 Linyi City

Kun Li
Financial Department

Phone:	+86 539 8914988
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Website:	www.sanyuanpipe.com/

Founding year:	2001
Employees on site:	760
Sector:	Steel products

Linyi Sanyuan Pipeline (LSP) is a steel seamless pipeline factory that produces pipe and tube of small and medium diameters. The plant was constructed in 2001 and has undergone various retrofits and equipment upgrades since operation started. LSP is located in near Linyi City in Shandong Province.

Wang Liqiang (Camco)

Resource Efficiency Programme

Measure	Type	Payback Period [years]	Invest [RMB]	Savings [RMB/a]	Energy Savings [kWh/a]	CO_2 Savings [t CO_2/a]
Install efficient WHR Boiler. Use steam for pipe finishing and staff facilities.	Heat recovery	0.4	100,000	273,750	3,502,084	1,084.05
Increase insulation, improve control of raw material door closing and reduce time pushing portals are open but not in operation.	Technical	0.0	0	138,136	1,767,177	547.02
Install 2 x Variable Speed Drives (VSD) on Main Duty compressor and slightly reduce system operating pressure.	Technical	0.8	180,000	216,810	361,350	312.21
Add 1 x Variable Speed Drive (VSD) and wire to both Dampers	Technical	0.5	85,000	175,025	291,708	252.00
Optimise gas station controls (e.g. ratio of cold air input, coal and steam based upon operation)	Technical	0.4	250,000	690,681	8,835,885	2,735.10
		Total	**615,000**	**1,494,402**	**14,758,204**	**4,930.38**

临沂三元管业有限公司

临沂三元管业有限公司
中华人民共和国山东临沂市
罗庄区汤庄工业园
276019 临沂市

李坤
财务部

电话：	0086 (0) 539 8914988
传真：	0086 (0) 539 8914988
邮件地址：	lysygy@163.com
公司主页：	www.sanyuanpipe.com

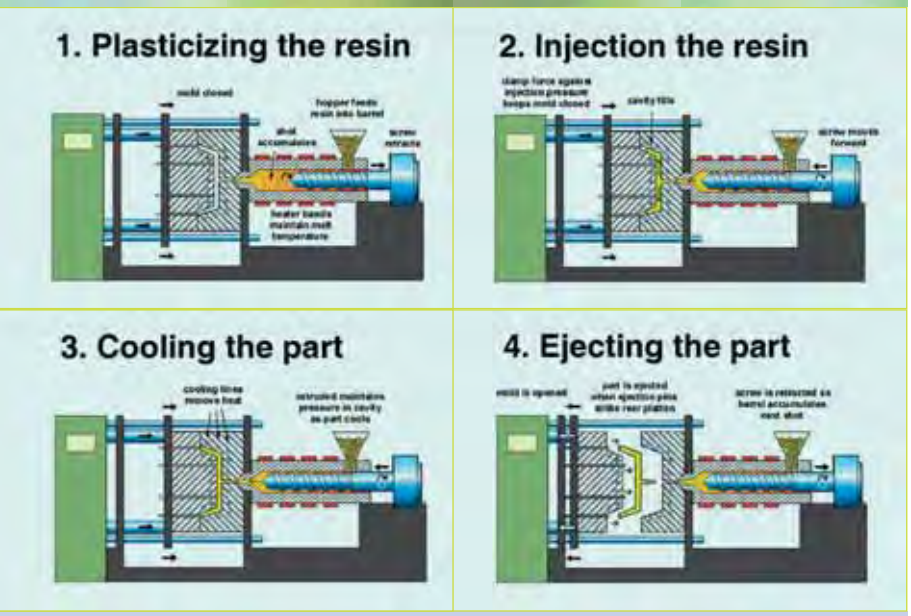
成立时间：	2001
员工数量：	760
产品领域：	制造业

三元管业是一家生产无缝钢管的企业，主要产品为一些中小口径的无缝钢管。工厂建立于2001年，至今进行过多项技术改造和设备升级。

王立强 (Camco)

资源利用效率提高计划

改进措施	类型	回报期限（年）	支出（元）	节省支出（元/年）	节能（千瓦时/年）	二氧化碳减排量（吨/年）
安装更加高效的废热利用锅炉来利用生产过程中产生的废热，替代燃煤锅炉	余热回收	0.4	100,000	273,750	3,502,084	1,084.05
目前的绝缘措施不是很完善。增加绝缘设施，减少加热炉开炉时间。	技术手段	0.0	0	138,136	1,767,177	547.02
目前两套空压系统不是很完善。空压机在达到额定压力后停机前仍然会消耗40%左右的能量。在两个空压房安装两套变频装置和减少运行压力	技术手段	0.8	180,000	216,810	361,350	312.21
2台37KW鼓风机不间断运行。增加一套变频装置	技术手段	0.5	85,000	175,025	291,708	252.00
为煤气站安装监控仪表，合理安排各种原料配比，安装PLC自动控制系统，提高能源利用率	技术手段	0.4	250,000	690,681	8,835,885	2,735.10
		总计	**615,000**	**1,494,402**	**14,758,204**	**4,930.38**



Marquardt Switches (Shanghai) Co., Ltd.

Marquardt Switches (Shanghai) Co., Ltd.
No. 650 Qingda Road
201201 Shanghai (Pudong)

David Jing
Operation Manager

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E-mail:	jianxiong.jing@marquardt.com.cn
Website:	www.marquardt.com.cn

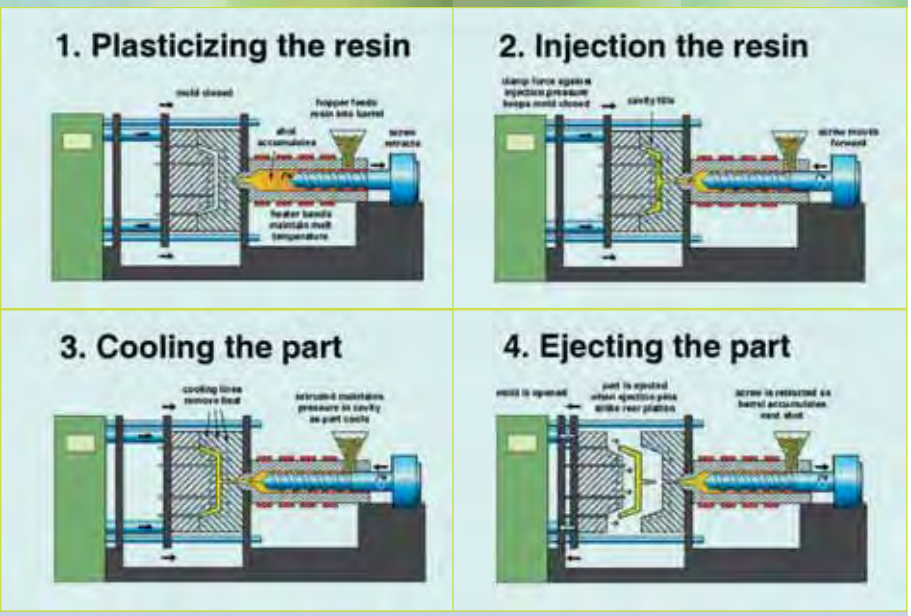
Founding year:	1996
Employees on site:	720
Sector:	Manufacturing Industry

Marquardt is an independent family owned company with 85 years history. We are a German wholly owned foreign enterprise in Shanghai. We are specialized in manufacturing and providing technical solutions for Automobiles, Power tools and Household appliances.
Marquardt - creating the future - innovative and quality-conscious
– Our customers have top priority.
– Together with our employees we will shape our future.
– Together with our suppliers we are working on challenging solutions.
– The society and the environment are important elements of our philosophy and actions.
– There's only one answer to the global challenge: Global Performance.

Project team from left to right: Mr. Yue Wu, Mr. Jianxiong Jing

Resource Efficiency Programme

Measure	Type	Payback Period [years]	Invest [RMB]	Savings [RMB/a]	Energy Savings [kWh/a]	CO_2 Savings [t CO_2/a]
Exchange old lighting against high efficient T5 tubelights	Lighting	4.0	21,000	5,300	5,300	4.47
Installation of CFLs in warehouse	Lighting	0.2	3,400	22,000	22,000	18.54
Installation of VSD on compressor	Compressed air	8.3	50,000	6,000	6,000	5.06
Free cooling system to reduce electricity consumption for machine cooling	Cooling	0.8	406,000	500,000	500,000	421.25
		Total	**480,400**	**533,300**	**533,300**	**449.32**



马夸特开关（上海）有限公司

马夸特开关（上海）有限公司
浦东合庆工业区庆达路650号
201201 上海市浦东新区

经健雄
运营经理

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传真：	021-58972399
邮件地址：	jianxiong.jing@marquardt.com.cn
公司主页：	www.marquardt.com.cn
成立时间：	1996
员工数量：	720
产品领域：	制造业

马夸特是一家拥有85年历史的家族企业。马夸特开关(上海)有限公司是德国马夸特集团的全资子公司,专业生产销售电动工具开关,汽车开关及家用开关。

马夸特的使命：创造未来——创新与质量同样重要

- 客户至上
- 与员工一起规划我们的未来
- 与供应商一起寻求具有竞争力的解决方案
- 社会与环境是我们理念与行动的先决要素
- 面对全球挑战我们唯一的应对方法就是：出色的国际表现。

项目团队从左到右依次为：吴越、经健雄

资源利用效率提高计划

改进措施	类型	回报期限（年）	支出（元）	节省支出（元/年）	节能（千瓦时/年）	二氧化碳减排量（吨/年）
用T5灯管替代原有灯管	节能照明	4.0	21,000	5,300	5,300	4.47
用荧光灯管替换仓储空间目前使用的金卤灯	节能照明	0.2	3,400	22,000	22,000	18.54
为空压机加装变频装置	压缩空气节能	8.3	50,000	6,000	6,000	5.06
加装自然冷却装置以降低机器冷却的能耗	制冷	0.8	406,000	500,000	500,000	421.25
		总计	**480,400**	**533,300**	**533,300**	**449.32**

Polymatech

Polymatech (Shanghai) Co., Ltd.

Polymatech (Shanghai) Co., Ltd.
NO. 718 Guangzhong Rd., Xingzhuang Industry Park,
201108 Shanghai

Xiangyu Jin
Admin. Dept. Manager

Phone:	+86 21 6442 2002 110
Fax:	+86 21 6442 2002 110
E-mail:	jinxiangyu@polymatech.cn
Website:	www.polymatech.co.jp

Founding year:	2001
Employees on site:	1,500
Sector:	Electrical Industry

Polymatech group is a world leading manufacturer in macromolecular polymer part area with global design center, six Asian wide factories and a global sale net. Polymatech (Shanghai) corporation limited was established in 2001. It occupies 55,188 m^2. There are three buildings in all with 32,600 m^2 and 1,500 employees. Our company can independently design and produce plastic parts of mobile phone, car and home related products. As the main manufacturer base in Polymatech group and a professional manufacturer in plastic industry, we have been accepted by numerous world's well known customers in mobile phone, car and home electronic equipment area such as Sony Ericsson, Pioneer, Panasonic, Sony, SHARP, Lenovo etc.

Polymatech EHS Team

Resource Efficiency Programme

Measure	Type	Payback Period [years]	Invest [RMB]	Savings [RMB/a]	Energy Savings [kWh/a]	CO_2 Savings [t CO_2/a]
Installation of photovoltaic modules to produce electricity	Renewable energy	30.3	25,000,000	825,000	1,100,000	926.75
Equip heating cylinders with insulation jackets to reduce heat losses	Technical	0.3	100,000	350,000	465,000	391.76
Free cooling system to reduce electricity consumption for machine cooling	Cooling	1.5	580,000	390,000	520,000	438.10
		Total	**25,680,000**	**1,565,000**	**2,085,000**	**1,756.61**

Polymatech

保力马科技（上海）有限公司

保力马科技（上海）有限公司
上海市闵行区莘庄工业区光中路718号
201108 上海

金香玉
总裁办经理

电话：	(86) 21-6442-2002-110
传真：	(86) 21-6442-2002-110
邮件地址：	jinxiangyu@polymatech.cn
公司主页：	http://www.polymatech.co.jp

成立时间：	2001
员工数量：	1500
产品领域：	电子产品

保力马集团是世界领先的高分子聚合物制造商，拥有环球设计中心、全球销售网以及六家亚洲工厂。保力马科技（上海）有限公司成立于2001年，公司占地55188.2平方米，三栋办公大楼总面积共计32600平方米，可容纳1500名员工。公司可独立设计和生产移动电话、汽车和家用相关产品的塑料配件。
作为主要的高分子聚合物生产基地以及专业的塑料制品生产商，保力马集团已在移动电话、汽车以及家用电子设备领域受到众多世界知名品牌的青睐，如索尼爱立信，先锋，松下，索尼，夏普，联想等。

保力马环境团队

资源利用效率提高计划

改进措施	类型	回报期限（年）	支出（元）	节省支出（元/年）	节能（千瓦时/年）	二氧化碳减排量（吨/年）
安装屋顶光伏发电装置	可再生能源利用	30.3	25,000,000	825,000	1,100,000	926.75
为注塑机加热料筒保温套以减少热散失	技术改进	0.3	100,000	350,000	465,000	391.76
加装空调自然冷却系统以降低机器冷却的能耗	制冷改进	1.5	580,000	390,000	520,000	438.10
		总计	**25,680,000**	**1,565,000**	**2,085,000**	**1,756.61**

Rittal Electro-Mechanical Technology (Shanghai) Co., Ltd.

Rittal Electro-Mechanical Technology (Shanghai) Co., Ltd.
1658 Minyi Road, Songjiang
201612 Shanghai

Qian Ye
EHS supervisor

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E-mail:	qian.y@rittal.cn
Website:	www.rittal.cn

Founding year:	2004
Employees on site:	1,102
Sector:	Electro-Mechanical

From the 90s of last century Rittal set up branch offices in China. Rittal established in the metropolis of Shanghai (China) a new high-tech production base which plays an important role for further growth in the Chinese Market. More than 28,000 square meters of production base to become the world's most advanced cabinet and chassis production base of high-tech. The production base has a broad product portfolio series, including the widespread international use of products, Rittal, a comprehensive quality management system ensures consistently high quality products.

Project team from left to right: Mrs. Ye Qian (EHS), Mr. Yurong He (Facility), Mr. Wei Shi (Maintenance)

Resource Efficiency Programme

Measure	Type	Payback Period [years]	Invest [RMB]	Savings [RMB/a]	Energy Savings [kWh/a]	CO_2 Savings [t CO_2/a]
Installation of an online metering system to reduce load and energy consumption	Technical	30.0	450,000	15,000	21,000	17.69
Equip pumps with VFD to fit power comsumption to demand	Technical	2.9	60,000	21,000	30,000	25.28
Recovery of waste heat from compressor	Heat recovery	1.1	80,000	70,000	100,000	84.25
Installation of pressure regulators to reduce air pressure to required level at workplace	Compressed air	1.9	25,000	13,000	18,500	15.59
Training for proper usage of compressed air	Compressed air	0	0	3,150	4,500	3.79
		Total	**615,000**	**122,150**	**174,000**	**146.60**

威图电子机械技术（上海）有限公司

威图电子机械技术（上海）有限公司
上海市松江工业区民益路1658号
201612 上海

钱烨
EHS主管

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邮件地址：	qian.y@rittal.cn
公司主页：	www.rittal.cn

成立时间：	2004
员工数量：	1102
产品领域：	电子机械

自威图上个世纪90年代在中国设立分公司以来，2004年又在中国上海建立起了新的高新技术生产基地，为其在中国市场的进一步的发展壮大起到了重要作用。公司拥有超过28000平方米的生产基地，是世界上最先进的机箱和电板的高新技术生产基地之一。生产基地拥有品种繁多的的系列产品组合，包括国际上广泛运用的产品系列，威图综合全面的质量管理系统保证了其始终如一的高质量产品。

从左到右依次为：钱烨（EHS部门）、何宇荣（设备部门）、侍威（维修部）

资源利用效率提高计划

改进措施	类型	回报期限（年）	支出（元）	节省支出（元/年）	节能（千瓦时/年）	二氧化碳减排量（吨/年）
安装在线实时用电计量系统以降低电负荷和能耗	技术手段	30.0	450,000	15,000	21,000	17.69
泵上加装变频装置以适应实际需要	技术手段	2.9	60,000	21,000	30,000	25.28
对空压机余热加以回收	余热回收节能	1.1	80,000	70,000	100,000	84.25
在相应用气点上加装空气压力调节器，将压力控制到适合的范围	压缩空气节能	1.9	25,000	13,000	18,500	15.59
对人员进行合理使用压缩空气的相关培训	压缩空气节能	0	0	3,150	4,500	3.79
		总计	**615,000**	**122,150**	**174,000**	**146.60**

Shaanxi Haisheng Fresh Fruit Juice Co., Ltd.

Shaanxi Haisheng Fresh Fruit Juice Co., Ltd.
B4-6 YuCai Building, No.2 YuCai Road, Xi'an,
Shaanxi Province
710061 Xi'an

David Hou
Commissioner of the Production Management Center

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Website:	www.chinahaisheng.com

Founding year:	1996
Employees on site:	140
Sector:	Concentrated fruit juice production

Shaanxi Haisheng is located near Xi'an in Shaanxi Province. Shaanxi Haisheng produces concentrated apple and pear juice. The factory uses heated evaporation to concentrate the fresh juice and processes around 130,000 tonnes of apples each year. Shaanxi Haisheng is part of of the Haisheng Group, one of the leading manufacturers and exporters of apple juice concentrate in the People's Republic of China.

From left: Haisheng employee, Maggie Li (Camco), Arrows Jia, Will Todd (Camco), Haisheng employee, Alex Liang (Camco), Wang Liqiang (Camco)

Resource Efficiency Programme

Measure	Type	Payback Period [years]	Invest [RMB]	Savings [RMB/a]	Energy Savings [kWh/a]	CO_2 Savings [t CO_2/a]
Monitoring and control system for wastewater treatment plant and upstream anaerobic biogas reactor	Renewable energy	1.4	500,000	362,500	4,215,875	1,435.5
Install online Dissolved Oxygen (DO) monitoring and VSD on air blowers	Technical	1.1	120,000	112,741	216,810	195.13
Enlarge boiler economizer, replace and upsize air preheaters, and add ash blower to prevent fouling.	Heat recovery	0.8	500,000	630,802	7,336,221	2,497.97
Retrofit VSD on feed pumps and automatic control based on water pressure	Technical	2.1	50,000	23,488	45,169	40.65
Fit automatic Top Blowdown controller (e.g. Spirax sarco Blowdown controller)	Technical	0.8	50,000	63,910	743,276	253.08
		Total	**1,220,000**	**1,193,441**	**12,557,351**	**4,422.33**

陕西海升果业发展股份有限公司

陕西海升果业发展股份有限公司
中国 陕西省澄城县
韦庄农业产业化园区
710061 西安市

侯大光
生产管理中心主任

电话：	0086-29-88109654
传真：	0086-29-85216521
邮件地址：	david.hou@chinahaisheng.com
公司主页：	http://www.chinahaisheng.com/

成立时间：	1996
员工数量：	140
产品领域：	浓缩果汁加工

陕西海升果业发展股份有限公司坐落于陕西省西安附近。陕西海升出产浓缩苹果汁和梨汁。这家制造厂使用热能蒸发技术萃取新鲜的果汁，每年消耗大约130,000吨苹果。陕西海升是海升集团公司旗下的分公司，海生集团公司是中国浓缩苹果汁领导生产商和出口商之一。

从左到右依次为：海升员工， 李娜 (Camco), 贾建伟, Will Todd (Camco), 海升员工， 梁永志 (Camco), 王立强 (Camco)

资源利用效率提高计划

改进措施	类型	回报期限（年）	支出（元）	节省支出（元/年）	节能（千瓦时/年）	二氧化碳减排量（吨/年）
安装污水处理控制系统和沼气回收系统	可再生能源	1.4	500,000	362,500	4,215,875	1,435.5
安装在线氧气监测系统和鼓风机变频系统	技术手段	1.1	120,000	112,741	216,810	195.13
更换空预器管径以达到更高效的利用或者锅炉内部增加吹灰器以减少管壁灰尘量	余热回收	0.8	500,000	630,802	7,336,221	2,497.97
为给水泵增加变频和水压控制系统	技术手段	2.1	50,000	23,488	45,169	40.65
增加顶部连排的自动控制（例如Spirax Sarco 连排控制）	技术手段	0.8	50,000	63,910	743,276	253.08
		总计	**1,220,000**	**1,193,441**	**12,557,351**	**4,422.33**

Shandong Jiaohua Casting Coke Co., Ltd.

Shandong Jiaohua Casting Coke Co., Ltd.
Zhubao town, Lanshan Distict, Shandong Province
276039 Linyi City

Jing Liu
Chief Financial Officer

Phone:	+86 0539 8550018
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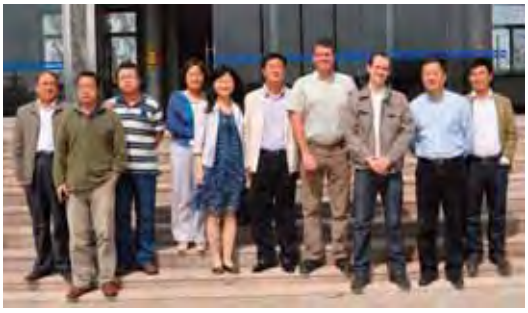
E-mail:	huzi980205@sina.com
Website:	www.chinashunxin.cn

Founding year:	2000
Employees on site:	270
Sector:	Casting coke

Founded in 2000, Shunxin Coking Plant located in Linyi, Shandong Province. The function of the facility is to convert coal into metrological coke. The production output of the facility in 2009 was 365,933 tonnes. The designed total capacity of Phase I and Phase II production lines is 800,000 tonnes. Each battery phase consists of 44 coke ovens giving 88 in total.



From left: Li, Wang Liqiang (Camco), Alex Liang (Camco), Liu Jing, Jin Yating (Camco), Yang Zijiang, Tim Jeffries (Camco), Robin Murray (Camco), Zhang Dayong and Zhang Yong (Camco)

Resource Efficiency Programme

Measure	Type	Payback Period [years]	Invest [RMB]	Savings [RMB/a]	Energy Savings [kWh/a]	CO_2 Savings [t CO_2/a]
150 t/h Coke Dry Quenching (CDQ) plant & 24MW power plant	Heat recovery	2.5	200,000,000	79,680,000	192,000,000	188,649.60
Phase 3 coke production line with new power plant	Technical	6.0	300,000,000	49,800,000	120,000,000	117,906.00
Add extra waste heat boiler stages to increase power generated	Heat recovery	2.4	800,000	332,000	800,000	786.04
Reduce turbine maintenance periods by installing automated ash blower on boiler	Heat recovery	1.8	2,000,000	1,120,500	2,700,000	2,652.89
		Total	**502,800,000**	**130,932,500**	**315,500,000**	**309,994.53**

山东焦化集团铸造焦有限公司

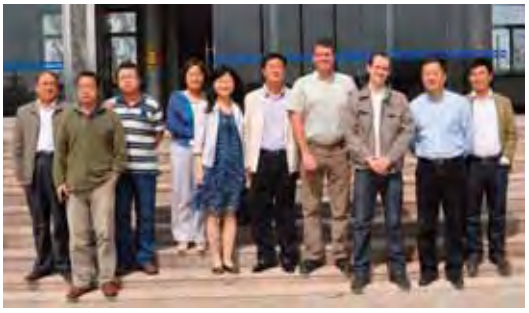
山东焦化集团铸造焦有限公司
山东省临沂市兰山区朱保镇
276039 临沂市

刘静
财务总监

电话：	0086-0539-8550018
传真：	0086-0539-8553777
邮件地址：	huzi980205@sina.com
公司主页：	http://chinashunxin.cn/

成立时间：	2000
员工数量：	270
产品领域：	炼焦, 二级铸造焦

山东焦化铸焦有限公司成立于2000年，位于山东省临沂市。主要是将煤炭制成铸造用焦炭，2009年产量为365933吨。设计生产能力为80万吨每年，每组有44个焦炉总计88个。



从左到右依次为：李先生， 王立强 (Camco), 梁永志 (Camco), 刘静， 靳雅婷 (Camco), 杨自江, Tim Jeffries (Camco), 罗斌 (Camco), 张大勇和张勇 (Camco)

资源利用效率提高计划

改进措施	类型	回报期限（年）	支出（元）	节省支出（元/年）	节能（千瓦时/年）	二氧化碳减排量（吨/年）
新建一个150吨/小时的干熄焦炉，同时新建一个24MW余热发电机组	余热回收	2.5	200,000,000	79,680,000	192,000,000	188,649.60
建设三期项目提高一倍产量	技术手段	6.0	300,000,000	49,800,000	120,000,000	117,906.00
增加余热锅炉受热面以利用更多的余热，增加发电量	余热回收	2.4	800,000	332,000	800,000	786.04
减少维修时间，给锅炉增加自动清灰系统	余热回收	1.8	2,000,000	1,120,500	2,700,000	2,652.89
		总计	**502,800,000**	**130,932,500**	**315,500,000**	**309,994.53**

Shanghai SEB Electric Appliance Co., Ltd.

Shanghai SEB Electric Appliance Co., Ltd.
No 398 Shen Nan Road, Xin Zhuang Industrial Zone
201108 Shanghai

Chen Jianyue
Site Quality Manager

Phone:	+86 21 64896969
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E-mail:	jychen@cn.roupeseb.com
Website:	www.groupeseb.com

Founding year:	1999
Employees on site:	1,000
Sector:	Small household appliance

Group SEB in France is now a multinational company and one of the largest household small electric appliances producer in the world. In 1996, Shanghai SEB Electric Appliances Co., Ltd. (SSEAC) was founded by Group SEB. As a business center in China, it includes manufacturing and sales. SSEAC total land area is 28,000 m^2, construction area is 13,000 m^2. ISO9001 certified by CQC and DNV in 2002 and ISO14001 by DNV in 2007. With advanced technology from Group SEB, SSEAC produced a series of good quality and well-designed products, such as iron, steamer, kettle, vacuum cleaner with TEFAL and ROWENTA brand. In 2008, our yearly output was more than 4,600,000 pieces exported to more than 30 countries. In compliance with the Group SEB eco-production commitment, SSEAC will continuously improve environmental performance.

The EHS team

Resource Efficiency Programme

Measure	Type	Payback Period [years]	Invest [RMB]	Savings [RMB/a]	Energy Savings [kWh/a]	CO_2 Savings [t CO_2/a]
Recovery of waste heat from compressor	Heat recovery	0.7	20,000	28,000	25,000	21.06
Training for proper usage of compressed air	Organisational, others	0	0	11,700	10,656	4.53
		Total	**20,000**	**39,700**	**35,656**	**25.59**

上海赛博电器有限公司

上海赛博电器有限公司
上海莘庄工业区申南路398号
201108 上海

陈建跃
现场质量管理经理

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传真：	86-021-64420029
邮件地址：	jychen@cn.roupeseb.com
公司主页：	www.groupeseb.com

成立时间：	1999
员工数量：	1000
产品领域：	小家电

法国赛博集团是多国合资的世界最大的小家电生产商之一。1996年，赛博集团在中国成立上海赛博电器有限公司，负责生产和销售。上海赛博电器有限公司占地28000平方米，建筑面积13000平方米。2002年通过CQC和DNV的ISO9001认证，2007年通过DNV的ISO14001认证。在赛博集团先进的生产技术支持下，上海赛博电器有限公司生产的一系列产品都有品质优越和设计精良，如法国特福和好运达牌的电熨斗、蒸汽熨斗、水壶以及真空吸尘器。2008年年产量超过四百六十万件，远销三十多个国家。为遵守赛博集团对生态生产的承诺，上海赛博电器有限公司将不断促进其环保工作的发展。

EHS团队

资源利用效率提高计划

改进措施	类型	回报期限（年）	支出（元）	节省支出（元/年）	节能（千瓦时/年）	二氧化碳减排量（吨/年）
对空压机余热加以回收	余热回收	0.7	20,000	28,000	25,000	21.06
对人员进行合理使用压缩空气的相关培训	组织管理及其它	0	0	11,700	10,656	4.53
		总计	**20,000**	**39,700**	**35,656**	**25.59**

Shanxi Meijing Energy Group

Shanxi Meijing Energy Group
TianLong Tower 12th Floor, Shifu West Sreet,
Taiyuan, Shanxi Province
030002 Taiyuan

Peifu Zhang
Vice General Manager

Phone:	+86 13 934595801
Fax:	+86 0351 5722971
Website:	www.mjenergy.com

Founding year:	2004
Employees on site:	5,000
Sector:	Coking

Founded in 2004, Meijin Coking Plant is located in Qinxu Shanxi Province. The function of the facility is to convert coal into metrological coke. The production output of the facility in 2009 was 1,047,742 tonnes. The designed total capacity production lines is 1,800,000 tonnes.

From left: Zhang Yong, Alex Liang, Wang Liqiang, Jin Yating, Tim Jeffries

Resource Efficiency Programme

Measure	Type	Payback Period [years]	Invest [RMB]	Savings [RMB/a]	Energy Savings [kWh/a]	CO_2 Savings [t CO_2/a]
Construction of 150 tonnes per hour Coke Dry Quenching (CDQ) plant	Heat recovery	2.5	200,000,000	79,680,000	192,000,000	188,649.60
Increase waste heat recovered from flue gas	Heat recovery	2.4	800,000	332,000	800,000	786.04
		Total	**200,800,000**	**80,012,000**	**192,800,000**	**18,435.64**

美锦能源集团有限公司

美锦能源集团有限公司
山西太原市府西街92号
天隆仓大厦12层
030002 太原

张佩富
策划部部长
电话：0086-13934595801
传真：0086-351-5722971
公司主页：www.mjenergy.com

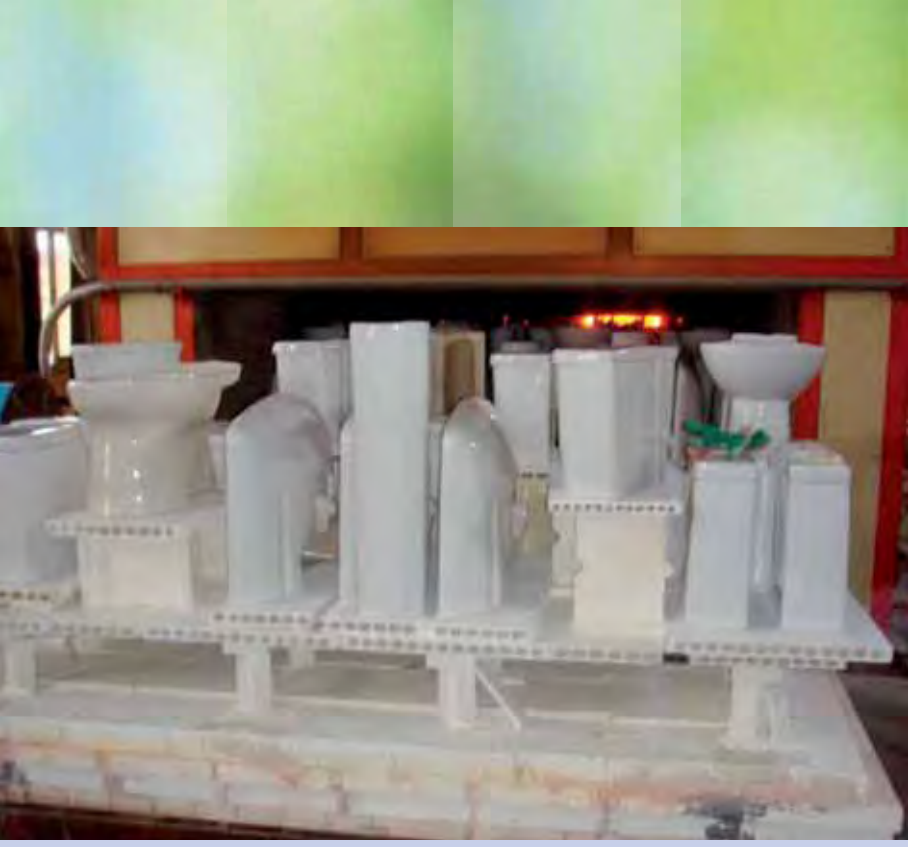
成立时间：	2004
员工数量：	5000
产品领域：	炼焦业

山西美锦亚泰焦化有限公司成立于2004年，位于山西省清徐县。主要是将煤炭制成焦炭，2009年产量为1047742吨。设计生产能力为180万吨每年。

Camco团队从左到右依次为：张勇，梁永志， 王立强，靳雅婷和Tim Jeffries

资源利用效率提高计划

改进措施	类型	回报期限（年）	支出（元）	节省支出（元/年）	节能（千瓦时/年）	二氧化碳减排量（吨/年）
改建两个200吨/小时的干熄焦炉	余热回收	2.5	200,000,000	79,680,000	192,000,000	188,649.60
利用现有余热锅炉回收利用烟气中热量产生蒸汽发电或者供暖	余热回收	2.4	800,000	332,000	800,000	786.04
		总计	**200,800,000**	**80,012,000**	**192,800,000**	**18,435.64**



Tangshan Imex Industrial Co., Ltd.

Tangshan Imex Industrial Co., Ltd.
Tianyuanli, Dali Road, Lubei District, Tangshan City,
Hebei Province
063000 Tangshan City

Guangrui Su
General Management Department

Phone:	+86 315 3382628
Fax:	+86 315 3382688
E-mail:	zhongtaojieju05-08@163.com
Website:	www.imexceramic.com

Founding year:	2001
Employees on site:	550
Sector:	Building materials, sanitary pottery

Tangshan IMEX owns and operates two factories located near Tangshan City, Hebei Province. The primary purpose of the sites is to produce sanitary porcelain wares including toilets and wash basins. Both of the factories have been built in the last 10 years but currently represent low technology, high labour intensity manufacturing methods.

Camco team (left to right): Zhang Yong, Robin Murray, Perry Liu

Resource Efficiency Programme

Measure	Type	Payback Period [years]	Invest [RMB]	Savings [RMB/a]	Energy Savings [kWh/a]	CO_2 Savings [t CO_2/a]
Install variable speed drives on ball grinders and vary drum speed	Technical	0.5	177,000	370,299	638,477	570.77
Upgrade the crushing process to reduce grinding energy	Technical	6.5	1,800,000	277,724	478,835	428.08
High pressure casting process to increase speed of throughput	Technical	8.4	11,500,000	1,371,341	6,379,479	1,020.72
Improving kiln insulation	Technical	1.2	1,300,000	1,080,195	5,025,067	804.01
Improve and increase utilisation of kiln waste heat	Technical	1.4	1,200,000	843,902	3,925,833	628.13
		Total	**15,977,000**	**3,943,461**	**16,447,691**	**3,451.71**

唐山中陶实业有限公司

唐山中陶实业有限公司
中国河北省唐山市路北区
大理路天源里
063000 唐山市

苏光总
副总经理

电话：	0086-0315-3382628
传真：	0086-315-3382688
邮件地址：	zhongtaojieju05-08@163.com
公司主页：	www.imexceramic.com

成立时间：	2001
员工数量：	550
产品领域：	建材行业, 卫生陶瓷

中陶目前在河北省唐山市近郊拥有两个工厂。主要产品为白色陶瓷包括厨卫用品。两个工厂都已经建厂满10年属于劳动密集型企业。

Camco团队从左到右依次为：张勇、罗斌、刘鹏

资源利用效率提高计划

改进措施	类型	回报期限（年）	支出（元）	节省支出（元/年）	节能（千瓦时/年）	二氧化碳减排量（吨/年）
给研磨机安装变频装置根据要求改变转速	技术手段	0.5	177,000	370,299	638,477	570.77
提升研磨工艺以减少研磨能耗	技术手段	6.5	1,800,000	277,724	478,835	428.08
高压粉碎工艺提高运行速度而且减少了水分含量，从而影响到干燥工艺	技术手段	8.4	11,500,000	1,371,341	6,379,479	1,020.72
提高窑炉隔热设施	技术手段	1.2	1,300,000	1,080,195	5,025,067	804.01
改善和增加窑余热回收	技术手段	1.4	1,200,000	843,902	3,925,833	628.13
		总计	**15,977,000**	**3,943,461**	**16,447,691**	**3,451.71**

Tangshan Xing Long Iron & Steel Co., Ltd.

Tangshan Xing Long Iron & Steel Co., Ltd.
Luan Xian, Tangshan, He Bei Province
64000 Tangshan

Guoqing Zheng
Vice President
Phone: +86 315 7590209
Fax: +86 315 7585555
E-mail: tsxlgtyxgs@sina.com

Founding year: 2000
Employees on site: 1,500
Sector: Steel

Tangshan Xing Long Iron & Steel is a small to medium-sized, privately owned, steelworks located near Tangshan, He Bei Province. Tangshan produces around 1 million tonnes of crude steel billets per year, supplying over 10 main customers. The factory is a non-integrated steelworks and has no coke production or steel rolling or finishing. Tangshan imports coke, iron ore (from China and abroad) and other raw materials including scrap, and limestone.

Camco team (left to right): Zhang Young, Reggae Zhong, Robin Murray

Resource Efficiency Programme

Measure	Type	Payback Period [years]	Invest [RMB]	Savings [RMB/a]	Energy Savings [kWh/a]	CO_2 Savings [t CO_2/a]
Sintering & sinter cooling heat recovery	Heat recovery	3.6	75,000,000	20,999,292	77,424,886	33,178.99
Pelletisation: recover sensible heat from induration strand	Heat recovery	2.4	5,000,000	2,099,614	7,741,327	3,317.40
Direct injection of reducing agents/ Pulverised Coal Injection (PCI)	Technical	1.5	5,000,000	3,335,800	12,333,333	5,270.58
Iron making: Install Top Pressure recovery Turbine (TRT)	Technical	2.9	15,000,000	5,256,000	17,520,000	17,214.28
Iron making: Preheat fuel & insulate cold blast line/waste gas flue	Heat recovery	0.4	4,000,000	9,078,386	33,472,222	14,304.17
		Total	**104,000,000**	**40,769,092**	**148,491,768**	**73,285.42**

唐山兴隆钢铁有限公司

唐山兴隆钢铁有限公司
河北省唐山滦县榛子镇
064000 唐山

甄国庆
副总经理
电话：0086-315-7590209
传真：0086-315-7585555
邮件地址：tsxlgtyxgs@sina.com

成立时间：	2000
员工数量：	1500
产品领域：	钢材

唐山兴隆钢铁有限公司坐落于河北省唐山附近，是一家中等规模私有制钢铁公司。该公司年产量为1百万吨粗钢坯，向十余家主要客户提供供货。兴隆钢铁厂并没有焦炭产品，轧钢以及处理加工工艺，不过该公司进口焦炭，铁矿石(来自国内外)以及其他原材料，包括钢铁渣与石灰岩。

Camco团队从左到右依次为：张勇、钟鸣、罗斌。

资源利用效率提高计划

M改进措施	类型	回报期限（年）	支出（元）	节省支出（元/年）	节能（千瓦时/年）	二氧化碳减排量（吨/年）
将由烧结机和烧结冷却系统中废热回收利用a)利用余热锅炉产生蒸汽 b)预热进入燃烧系统的空气	余热回收	3.6	75,000,000	20,999,292	77,424,886	33,178.99
球团工序：回收利用硬化线中热能可以提高工艺能效和减少燃料消耗	余热回收	2.4	5,000,000	2,099,614	7,741,327	3,317.40
还原剂直接喷射。粉煤喷射系统 (PCI)	技术手段	1.5	5,000,000	3,335,800	12,333,333	5,270.58
安装炉顶压差利用装置，压力范围在130千帕左右，流量为11万立方米每小时 (TRT)	技术手段	2.9	15,000,000	5,256,000	17,520,000	17,214.28
热炉效率需要提高：对燃料进行预热，回收利用废气中的热能	余热回收	0.4	4,000,000	9,078,386	33,472,222	14,304.17
		总计	**104,000,000**	**40,769,092**	**148,491,768**	**73,285.42**

Weidmüller Interface (Suzhou) Co., Ltd.

Weidmüller Interface (Suzhou) Co., Ltd.
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Fax: +86 512 68413225-6410
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Website: www.weidmueller.com.cn

Founding year: 2003
Employees on site: 654
Sector: Electrical Industry

As the leading provider of solutions for the transmission of power, signals and data in industrial environments, the Weidmuller group raises the claim to set particularly high quality standards in technology . As a globally acting company, Weidmuller is geared to profitable and lasting growth. This not only includes high technology and economical quality standards, but also social and ecological responsibility. For over 20 years, the topics "Environment" and "Health and Safety" are essential elements of the policy of the Weidmuller group. Being aware of the impact of the company's activities on the environment and society, Weidmuller has always stood behind its social responsibility.

From left: Ms. Cici Wang, Ms. Spring Wang, Mr. Bob Li, Ms. Jessica Tao, Mr. Sam Du

Resource Efficiency Programme

Measure	Type	Payback Period [years]	Invest [RMB]	Savings [RMB/a]	Energy Savings [kWh/a]	CO_2 Savings [t CO_2/a]
Replacement of lighting with more efficient CFLs	Lighting	2.43	93,600	38,534	43,200	36.40
Equip heating cylinders with insulation jackets to reduce heat losses	Technical	3.8	55,200	14,500	16,120	13.58
Change new Type of compress air gun	Compressed air	0.69	220	316	–	–
		Total	**149,020**	**53,350**	**59,320**	**49.98**

魏德米勒电联接（苏州）有限公司

魏德米勒电联接（苏州）有限公司
江苏省苏州新区向阳路81号
苏州高新技术产业园3区6号
215011 江苏省苏州

王惜昕
质量经理

电话：	0512-68410007-6410
传真：	0512-68413225-6410
邮件地址：	cici.wang@weidmuller.com.cn
公司主页：	http://www.weidmueller.com.cn

成立时间：	2003
员工数量：	654
产品领域：	电子产品

作为提供工业环境领域里电力、信号和数据传输方案的领军人，魏德米勒集团尤其重视在科技方面设立高品质产品标准。作为一个全球性的公司，魏德米勒更致力于公司的可持续发展。这意味着我们不仅仅要关注科技和经济方面的发展，同时对社会责任和生态领域方面提高要求。二十多年来，魏德米勒集团一直坚持着“健康与安全”两个基本方针，公司也时刻关注着生产活动对环境社会所造成的影响，并始终积极承担起相应的社会责任。

团队成员（从左到右）：王惜昕，王春碧，李彬，陶杰，杜子龙

资源利用效率提高计划

改进措施	类型	回报期限（年）	支出（元）	节省支出（元/年）	节能（千瓦时/年）	二氧化碳减排量（吨/年）
用更高效的灯管替代现有的	节能照明	2.43	93,600	38,534	43,200	36.40
为注塑机加热料筒保温套以减少热散失	技术改进	3.8	55,200	14,500	16,120	13.58
更换新型气动枪	压缩空气节能	0.69	220	316	–	–
		总计	**149,020**	**53,350**	**59,320**	**49.98**

WIKA Instrumentation (Suzhou) Co., Ltd.

WIKA Instrumentation (Suzhou) Co., Ltd.
81, Ta Yuan Road SND
215011 Suzhou

Yueyue Zhang
MD Secretary

Phone:	+86 512 68788000-671
Fax:	+86 512 68092321-671
E-mail:	gs62@wika.cn
Website:	www.wika.com

Founding year:	1998
Employees on site:	200
Sector:	Pressure/temperature measurements

WIKA Instrumentation (Suzhou) Co., Ltd. was founded in 1998 to start the production of pressure and temperature gauges in China for the domestic and Asia-Pacific market. WIKA Suzhou plant with 20,410 m² area produces a variety of standard pressure and temperature gauges for many industries and the main products include brass pressure gauge, stainless steel pressure gauge, electric contact pressure gauge, diaphragm seals, SF6 gas density meter, stainless steel temperature gauge, electronic temperature probe and thermowell. WIKA China owns ISO9001 & 14001 quality and environmental management system certification and can provide UL, NEPSI etc. international certification as customers' requirement. Meanwhile, WIKA China has built the calibration lab in Suzhou, which has been approved through ISO17025 & CNAS and is qualified for calibration work from outside.

Project team from left to right: Mr. Litai Zhan, Mrs. Xiaya Fang, Mrs. Zhangnü Jiao, Mrs. Yueyue Zhang

Resource Efficiency Programme

Measure	Type	Payback Period [years]	Invest [RMB]	Savings [RMB/a]	Energy Savings [kWh/a]	CO_2 Savings [t CO_2/a]
Installation of an online metering system to reduce load and energy consumption	Organisational, others	56.0	140,000	2,500	2,300	1.94
Installation of photovoltaic modules to produce electricity	Renewable energy	20.7	9,500,000	459,800	418,000	352.17
Use solar water heating	Renewable energy	7.7	40,000	5,170	4,700	3.96
Training for proper usage of compressed air	Organisational, others	0	0	3,300	3,000	2.53
		Total	**9,680,000**	**470,770**	**428,000**	**360.60**

威卡自动化仪表（苏州）有限公司

威卡自动化仪表（苏州）有限公司
苏州新区塔园路81号
215011 苏州

张悦悦
中国区总经理助理
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邮件地址：gs62@wika.cn
公司主页：www.wika.com

成立时间：1998
员工数量：200
产品领域：压力及温度测量

威卡自动化仪表（苏州）有限公司成立于1998年，主要生产压力表和温度计，产品业务覆盖中国大陆和亚太地区。作为世界市场压力和温度测量领域的佼佼者，威卡苏州工厂也保持了微卡产品世界知名的高品质。威卡苏州工厂占地面积达20410平方米，为很多行业提供各种标准压力表和温度计，生产的产品主要包括：一系列的黄铜压力表，不锈钢压力表，电接点压力表，膜片密封，SF6气体密度计，不锈钢温度计，电子温度计探头及保温套管。
威卡中国拥有ISO 9001和ISO 14001质量及环境管理体系认证，并可根据客户的需要提供如UL，CSA，NEPSI，ATEX等国际认证。同时，威卡中国在苏州建立了压力和温度校准实验室，已经通过ISO17025和CNAS认可批准，可对外承接校准业务。

从左到右依次为：战立泰，方霞伢，焦章女，张悦悦

资源利用效率提高计划

改进措施	类型	回报期限（年）	支出（元）	节省支出（元/年）	节能（千瓦时/年）	二氧化碳减排量（吨/年）
安装在线实时用电计量系统以降低电负荷和能耗	组织管理及其它	56.0	140,000	2,500	2,300	1.94
安装屋顶光伏发电装置	可再生能源利用	20.7	9,500,000	459,800	418,000	352.17
利用太阳热能产生热水	可再生能源利用	7.7	40,000	5,170	4,700	3.96
对人员进行合理使用压缩空气的相关培训	组织管理及其它	0	0	3,300	3,000	2.53
		总计	**9,680,000**	**470,770**	**428,000**	**360.60**

Xinqiao Plant, 3M China Co., Ltd.

Xinqiao Plant, 3M China Co., Ltd.
38 Minyi Road, Shanghai
201612 Shanghai

Leo Yuan
Manager Plant Engineering
Phone: +86 21 57686635
Fax: +86 21 57686634
E-mail: lyuan@mmm.com
Website: www.3m.com

Founding year:	1997
Employees on site:	421
Sector:	Manufactory Reflecting sheeting, Industrial tape

3M, known for innovation, world-famous product range, in its more than 100 years history in the development of over sixty thousand kinds of high quality products. Hundred years 3M's products have touched people's lives, from household goods to medical supplies, from the transport construction to business, education and electronics, communications and other fields, have greatly changed the way people live and work.

Energy Management Team

Resource Efficiency Programme

Measure	Type	Payback Period [years]	Invest [RMB]	Savings [RMB/a]	Energy Savings [kWh/a]	CO_2 Savings [t CO_2/a]
Installation of an online metering system to reduce load and energy consumption	Technical	11.0	640,000	58,000	96,000	80.88
Installation of photovoltaic modules to produce electricity	Renewable energy	37.9	2,500,000	66,000	110,000	92.68
Cogeneration unit for production of process heat and electricity	Cogeneration	3.0	3,000,000	999,600	1,666,000	1,403.60
Combination of cogeneration and absortion chiller (cchp) to produce process heat, electricity and cold	Cogeneration	3.2	4,000,000	1,260,000	2,100,000	1,769.25
		Total	**10,140,000**	**2,383,600**	**3,972,000**	**3,346.41**

3M中国有限公司新桥工厂

3M中国有限公司新桥工厂
中国上海市松江区新桥镇民益路38号
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袁林
设备安装工程部经理

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传真：	0086 21 57686634
邮件地址：	lyuan@mmm.com
公司主页：	www.3m.com

成立时间：	1997
员工数量：	421
产品领域：	交通反光膜结构材料及工业用胶带

3M公司素以勇于创新、产品繁多闻名，在其一百多年的历史中该公司开发了六万多种高品质产品。近百年来，3M的产品已融入了人们的生活，从家庭用品到医疗用品，从运输、建筑、商业到教育、电子、通信等各个领域，极大地改变了人们的生活和工作方式。

能源管理小组

资源利用效率提高计划

改进措施	类型	回报期限（年）	支出（元）	节省支出（元/年）	节能（千瓦时/年）	二氧化碳减排量（吨/年）
安装在线实时用电计量系统以降低电负荷和能耗	技术手段	11.0	640,000	58,000	96,000	80.88
安装屋顶光伏发电装置	可再生能源利用	37.9	2,500,000	66,000	110,000	92.68
安装热电联产系统同时发电和产热	热电联产	3.0	3,000,000	999,600	1,666,000	1,403.60
热电联产技术与吸收式制冷技术结合，同时发电、产热和制冷	热电联产	3.2	4,000,000	1,260,000	2,100,000	1,769.25
		总计	**10,140,000**	**2,383,600**	**3,972,000**	**3,346.41**

Zhejiang Huayou Cobalt Nickel Materials Co., Ltd.

Zhejiang Huayou Cobalt Nickel Materials Co., Ltd.
No.18, Wuzhen East Road, Tongxiang City,
Zhejiang Province
314500 Tongxiang City

Dongye Zhao
Energy Manager

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Website:	www.huayou.com/

Founding year:	1995
Employees on site:	714
Sector:	Chemical Industry, cobalto-cobaltic, oxide, cobalt sulphate, electrolytic coppers

Zhejiang Huayou Cobalt Nickel Materials Co., Ltd. is a private Chinese enterprise engaged in manufacturing and smelting metal content of cobalt, nickel, and copper related chemicals, as well as processing new chemical materials. It is the largest cobalt product manufacturer in China. Its products include cobalt tetroxide, cobalt monoxide, cobalt superfine powders, t-cobalt oxide, cobalt oxalate, cobalt carbonate, cobalt sulfate, cobalt chloride, nickel oxalate, nickel oxide, nickel sulfate, nickel powder, copper oxide, copper sulfate and other cobalt, and nickel and copper related new materials.

Camco team (left to right): Horace Feng, Alex Liang

Resource Efficiency Programme

Measure	Type	Payback Period [years]	Invest [RMB]	Savings [RMB/a]	Energy Savings [kWh/a]	CO_2 Savings [t CO_2/a]
New 3D stiring blade in leaching tank with appropriate sized motor	Technical	1.9	150,000	77,548	929,590	67.00
Preheat leaching water from waste heat from Cobalt Carbonate drying	Heat recovery	3.1	50,000	16,000	746,730	-
Recovery waste heat from 60° C process waste water	Heat recovery	2.5	150,000	60,000	2,800,238	-
Replace belt drives with gear driven system in waste water plant	Technical	3.1	14,000	4,476	53,655	3.87
Installation of monitoring and control system	Technical	0.7	200,000	285,839	673,715	246.96
		Total	**564,000**	**443,863**	**5,203,928**	**317.83**

浙江华友钴业股份有限公司

浙江华友钴业股份有限公司
浙江省桐乡市
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314500 桐乡市

赵东野
能管员

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传真：	0086-573-88588771
邮件地址：	zdy@huayou.com
公司主页：	http://www.huayou.com

成立时间：	1995
员工数量：	714
产品领域：	化工，四氧化三钴、硫酸钴、电积铜

浙江华友钴业股份有限公司是一家制造及熔炼含钴、镍、铜的化学品的公司，同时也生产新型化学材料。他是中国最大的钴生产商。产品包括四氧化钴，一氧化钴，钴极细粉末，t钴氧化物，草酸钴，碳酸钴，硫酸钴，氯化钴，草酸镍，氧化镍，硫酸镍，镍粉沫，氧化铜，硫酸铜，以及其他钴，镍、铜新材料。

Camco团队从左到右依次为：房力强、梁永志

资源利用效率提高计划

改进措施	类型	回报期限（年）	支出（元）	节省支出（元/年）	节能（千瓦时/年）	二氧化碳减排量（吨/年）
对叶片的形线进行3D计算，然后选择合适的电机	技术手段	1.9	150,000	77,548	929,590	67.00
回收利用烘干机余热，预热水	余热回收	3.1	50,000	16,000	746,730	-
利用废水的余热	余热回收	2.5	150,000	60,000	2,800,238	-
采用联轴器传动方式	技术手段	3.1	14,000	4,476	53,655	3.87
安装监测和控制系统	技术手段	0.7	200,000	285,839	673,715	246.96
		总计	**564,000**	**443,863**	**5,203,928**	**317.83**