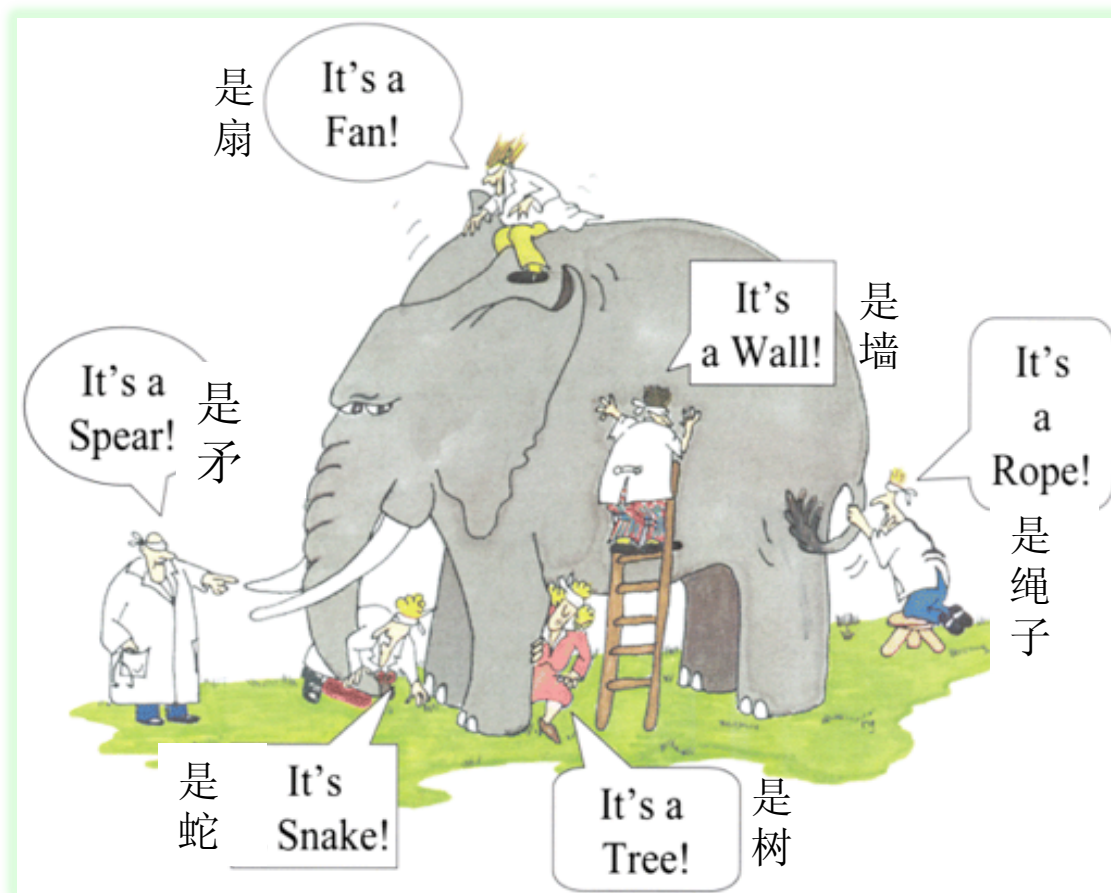


The Benefits of Integrated Green Standards

整合綠色標準的利益



把冲突改成合作 Convert Conflict into Collaboration





ISO 14000 Environmental Management Standards

ISO 14000 环保管理标准

ISO 14000 is about process, not products

ISO 14000 的焦点在过程；不在出品

Result of UN Conference on Environment & Development, Rio de Janeiro 1992.
是联合国在1992 Rio de Janeiro 环保发展论坛的效果

ISO 14004 & ISO 14001 were **first published in September and October 1996**
第一套出来的标准，ISO 14004 和 ISO 14001 是1996 九月和十月出版的

The ISO 14000 family are standards and guidelines on environmental management systems and supporting standards on terminology and tools, such as auditing.

ISO 14000 套标准和指南内容支持环保管理系统的词汇和工具（例如审计系统和工具）

Goals: Minimize harm to the environment by organizational activities:
either during production or disposal, by pollution or by depleting resources.

目标是最低组织作业和处理垃圾活动的环境伤害

http://www.crc.uri.edu/download/12_ISO_14000_Summary_ok.pdf

There are many organizations that specialize in helping others use these standards
有很多专门帮助别的组织利用这些标准



Most People know about **LEED™** Standards in the USA
 The latest version is LEED 3.0 which added validation requirements in 2010
 US Green Building Council <http://www.usgbc.org>

LEED™ Green Building Standards 绿色建筑标准

USGBC, National and World Green Building Councils 美国,某国家和世界绿色建筑促进会

Voluntary: Focus on Designers, Developers and Builders – not government or end users

志愿的： 焦点在社设计员， 发展者和建筑专家； 不在政府或利用者

Point based Levels: Certified Bronze Silver Gold Platinum
 赚取积分水平： 证明的 青铜 银 金 白金

Prerequisites: All health and safety standards – including standard best practices

必要需求： 所有的健康和安安全标准 – 也包括最佳做法

Defined Scopes 确定的范围：

New Construction	Existing Buildings	Commercial Interiors	Neighborhood Design	Houses	etc.
新建筑	存在建筑	商业内饰	邻里设计	住房	等等





CALGREEN is New!

California's *Mandatory Multidimensional Green Building Standard 2010* (Will take effect in January 2011)

美国加州政府的强制性的2010年多方面的绿色标准 (2011 开始使用)

Planning and Design	计划和设计
Energy Efficiency	节能
Water efficiency	节水
Material and resource conservation	节省材料和资源
Environmental Quality	环境质量

The California Air Resources Board estimates will reduce greenhouse gas emissions (CO₂ equivalent) by 3 million metric tons equivalent in 2020.

加州空气资源委员会估计这个标准会减少 CO₂e 排放300万公吨在2020年前。

Mandatory Minimum requirements; *No cost certification* 强制性最低标准; 证明书免费

Local jurisdictions encouraged *to take additional appropriate actions* to green their buildings, reduce greenhouse gas emissions, improve energy efficiency and conserve natural resources.

鼓励地方政府提高最低需要为了节能减排和保存自然资料按照地方条件

(Myth vs. Fact: Setting the Record Straight On 2010 California Green Building Standards Code)



Compare CALGREEN 2011 & LEED 3.0 Certification

CalGreen Mandatory NonResidential	LEED V3 New Construction
Bicycle Parking and Showers	1 pt for Alternate Transport/bicycles...
Parking for efficient and car pools	3 pts for low emitting & efficient vehicles
Light pollution reduction strategies	1 pt for light pollution reduction
Paving/ Grading to direct water away from the building	1 pt for storm water design
Separate water meters over 100 gal/day	No equivalent credit
Energy Efficiency	Energy Efficiency
Encourage 15% reduction below State Mandated efficiency standards	Minimum energy performance 0 points

1. **CALGREEN (California's Building Standard (effective 1/2011))** has mandatory minimums (that LEED does not have the authority to impose)

2. CALGREEN encourages builders to reach for more than minimum requirements. (new)

CALGREEN certification using minimums would earn about 17 LEED points; 40 points are needed to be certified under LEED 3.0. But CALGREEN encourages voluntary points and CALGREEN certification is free beyond doing the work. (LEED certifiers charge for their work)

In the end, LEED is greener, but it is not mandatory and it costs to get certified; Thus, the two actually complement each other and encourage each other to do better.



Chinese MOHURD “3 Star” Standard 2006

(Ministry of Housing, Urban and Rural Development)

Requirements for Residential Building Certification

This 2006 “3 star” point-based system is similar to LEED in that it overlays traditional Building safety regulations.

And it is similar to CALGREEN in that it is free to any builder and rating is done by government employed inspectors -- at each stage of the building’s life-cycle.

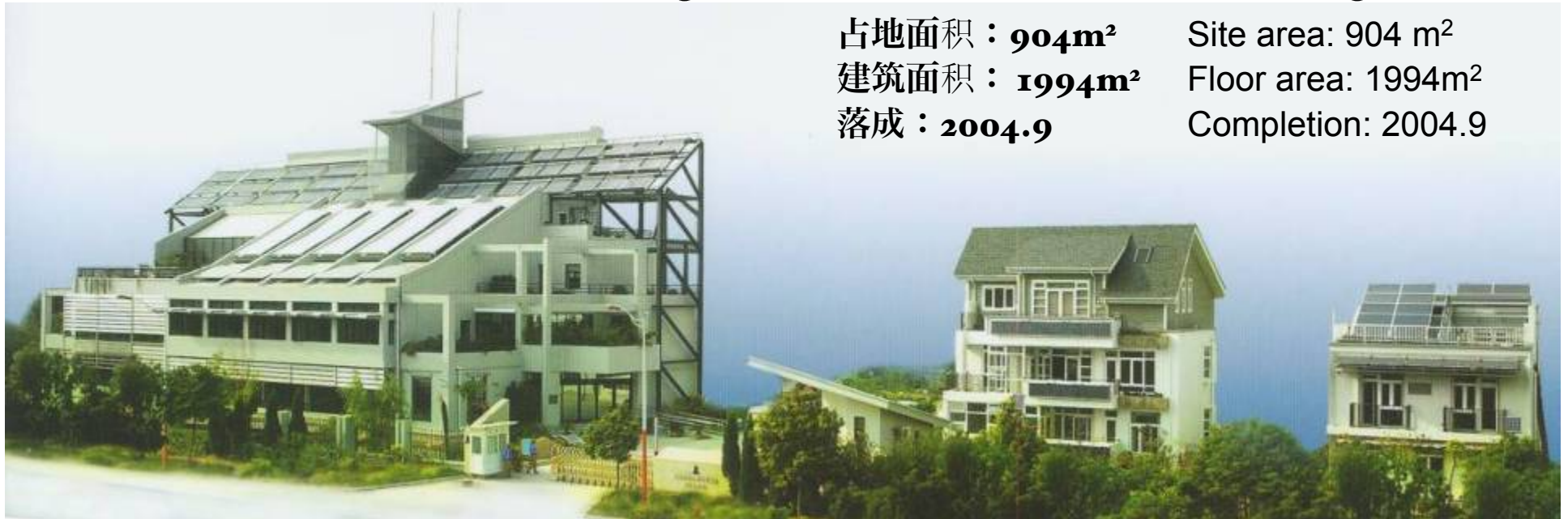
Table 3.2.2-1 Item Requirement for Grade Classification of Green Building (Residential Building)

Grade	General Items (Total: 40 Items)						Preference Items (Total: 9 Items)
	Land Saving & Outdoor Environment (Total: 8 items)	Energy Saving & Energy Utilization (Total: 6 Items)	Water Saving & Water Resource Utilization (Total: 6 Items)	Material Saving & Material Resource Utilization (Total: 7 Items)	Indoor Environment Quality (Total: 6 Items)	Operating Management (Total: 7 Items)	
★	4	2	3	3	2	4	-
★★	5	3	4	4	3	5	3
★★★	6	4	5	5	4	6	5



Implementing MOHURD Standards

上海生态建筑示范楼 (Shanghai Demonstration Eco Building)



占地面积：904m²

Site area: 904 m²

建筑面积：1994m²

Floor area: 1994m²

落成：2004.9

Completion: 2004.9

2008年建设部首批绿色建筑设计评价标识三星级认证

3-star Green Building Design Label Certification , MOHURD, 2008

2005年建设部首届“全国绿色建筑创新奖一等奖”

First prize in National Green Construction Innovation, MOHURD opening session, 2005

2005年全国十大建设科技成就奖

Scientific and Technological Accomplishment: One of Top Ten Projects in China, 2005

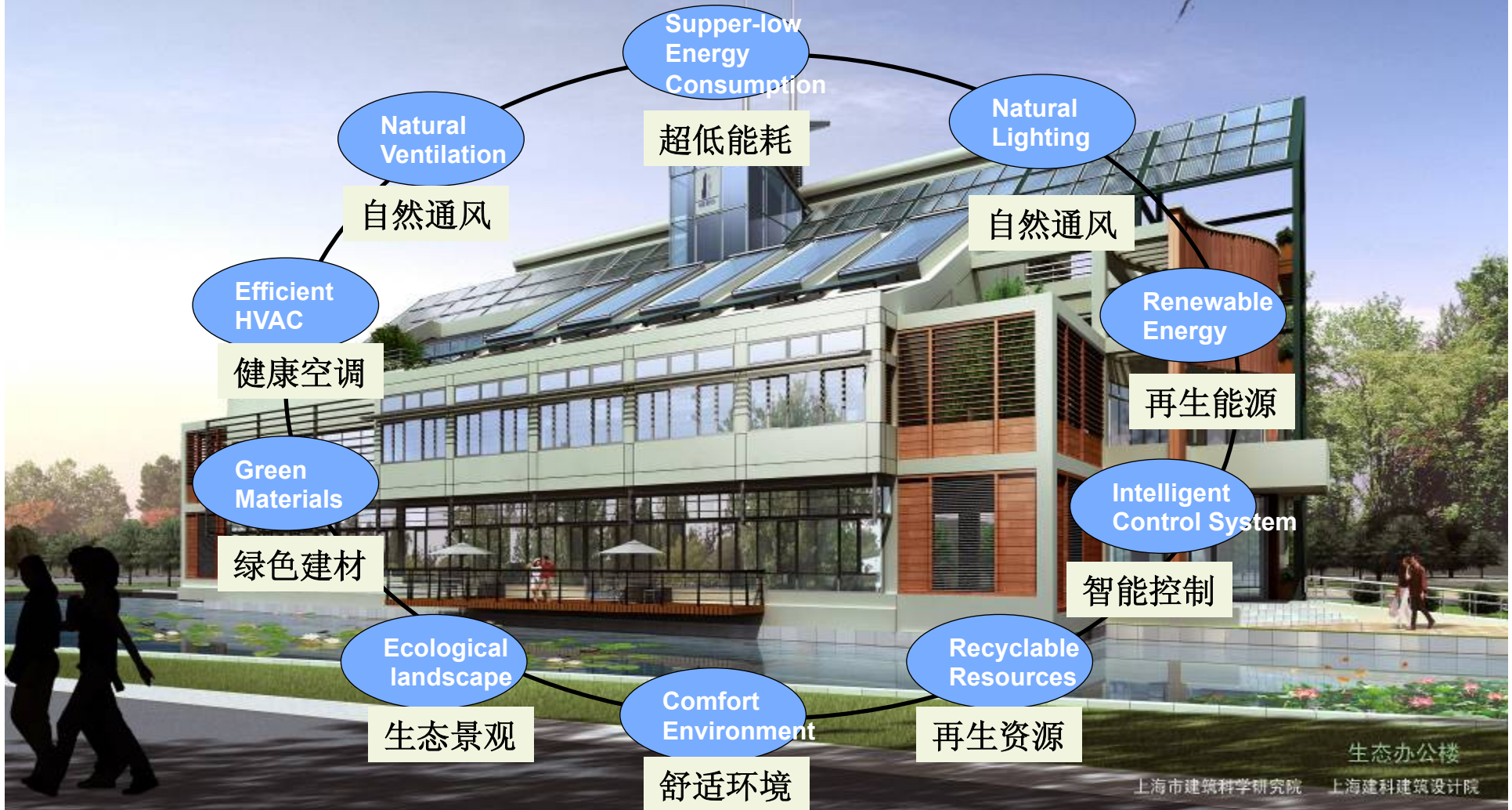


E³Regenesis

Xu Qiang, Shanghai Building Science Research Institute & SCRIBS

regenerating energy, environment & economy

十项关键技术 (Key Technologies in SRIBS Eco-building)



上海中心大厦 (Shanghai Tower)

集成绿色关键技术

- 建筑群风环境优化设计
- 分布式能源利用
- 冰蓄冷调峰技术
- 浅层地源热泵利用
- 高空涡轮式风机发电
- 高效智能照明调控
- 中雨水回收利用
- 建材污染物控制
- 室内空气品质监控

Integrated technologies

- Wind environment optimization
- Distributed energy sources
- Ice-Storage technology
- Ground source heat pump technology
- Wind turbine generator
- Intelligent lighting control system
- Rainwater and grey-water utilization
- Healthy building materials
- Indoor air quality monitoring system



(The tallest building in China.
Height: 632 m. Building
area: 380,000 m²)

- **目标(Technology Goals)**
:中国绿色建筑三星级
和美国LEED金奖

Targets: China ★★★ Green
Building & American
LEED Gold label
(still under construction) (JC)



Suzhou Industrial Park (SIP) 1994-2010

An Early Model for International Collaboration in Green Development

Now we will look at larger green building projects: Industrial parks and cities.



SIP covers a total jurisdiction area of 288 sq km, among which 80 sq km area belongs to China-Singapore Cooperation Zone.



SIP Planning Concepts and Practices

Think Globally, Act Locally (Eco-City Principles)

- Focus on "transformation, optimization, upgrading, and innovation".
- Four action plans:
 - industrial upgrading
 - technological leap growth (new "Silicon Valley")
 - service sector multiple growth by replacing energy-consuming industries with highly efficient and advanced industries, optimizing the secondary sectors and promoting the tertiary industry
 - ecological optimization
- Planning Legislation and Enforcement
 - strict land parcel bidding procedures
 - flexible control of functionally undefined land to improve development efficiency and land use intensity
 - "one-stop" coordinated public bidding, project examination and approval process for all construction projects
 - transparent administration environment

Today enforcement takes a new turn: banks are not permitted to make loans to builders that have a record of environmental violations.

http://www.sipac.gov.cn/english/Investment/200901/t20090116_36719.htm

Khee Poh Lam PhD

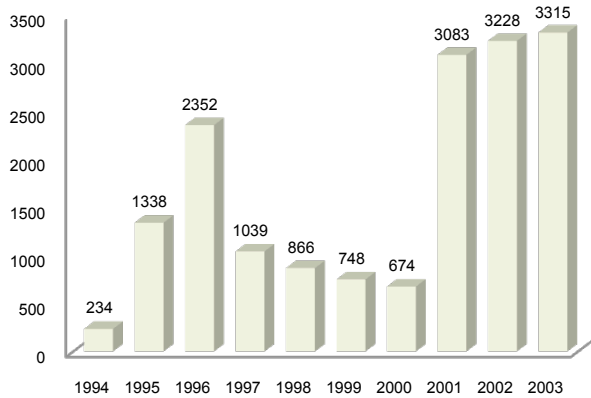


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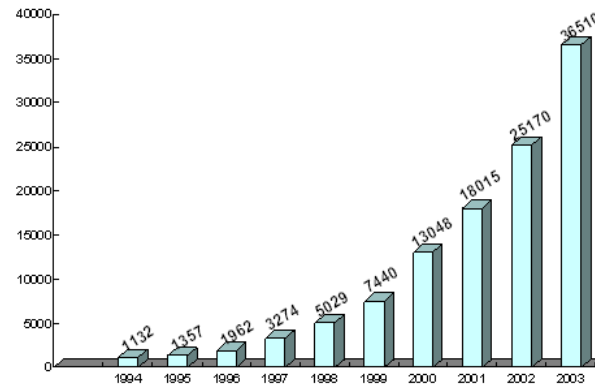
regenerating energy, environment & economy

Significant Economic Results of SIP

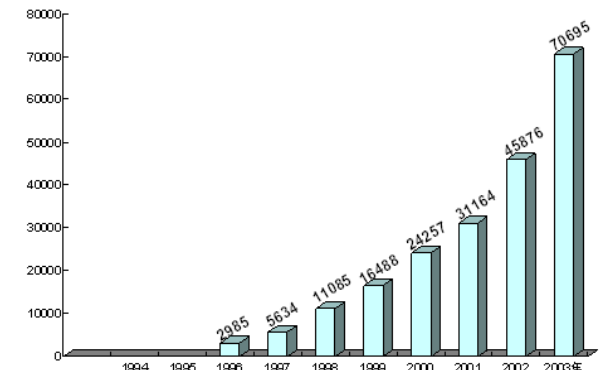
Why do some people argue that green industries will prevent economic development and limit jobs?



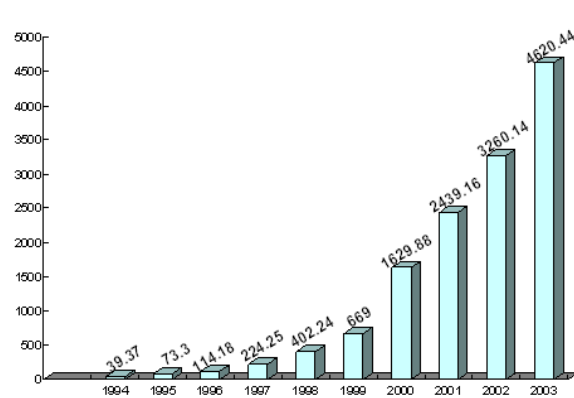
Total Investment (x million US\$)



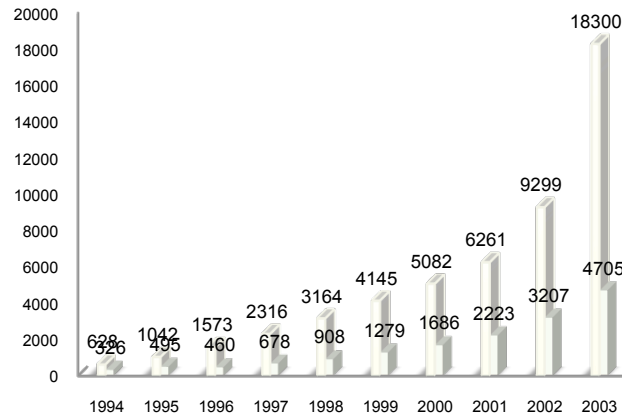
Gross Domestic Product (x million Yuan)



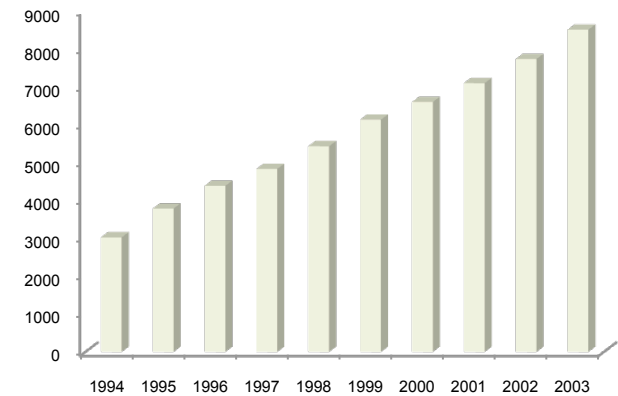
Total Employees



Total Government Revenue (x million Yuan)



Deposits Balance of Financial Institutions at Yearend And Savings Deposits of Residents (x million Yuan)



Net Income Per Capita of Farmers (Yuan)



Key Achievements: SIP Eco-City

(over the past 15 years since 1994)

- **Annual revenue increased** from 30 million Yuan in the beginning, to nearly 10 billion Yuan.
- **Gross regional product exceeded 100 billion Yuan per year**, increasing nearly 100 times compared to the early days of exploration.
- Total of more than **100 billion Yuan in tax revenues**.
- **Utilized foreign funds of nearly US\$ 16 billion**.
- Registered capital of more than 130 billion Yuan, and **created 500,000 job opportunities**.
- **Average salary of local working population** reaches 37,700 Yuan, and the rural per capita net income is 15,000 Yuan, both registering about five times increase over the early period of its development.
- **Level of per capita GDP in the SIP is close to that of Singapore** (US\$36,500.00) (China average – US\$6600.00)
- **ISO 14000 Certification:** 45% and a total of 33.67 million square meters of green area obtained the ISO14000 certification for environment, and became one of the first National Pilot Ecological Industrial Parks, with several records in terms of total coverage of environmental-protection infrastructure, of green towns and villages, and with the most local enterprises meeting ISO14001 standards.
- **Reducing the amount of energy consumption** to 0.36 ton of standard coal equivalent per ten thousand Yuan GDP, and the emission of CO₂ and SO₂ to 1/18 and 1/40 of national averages

Khee Poh Lam PhD



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