GENERAL RECOMMENDATIONS

SUSTAINABLE INDUSTRIALIZATION AND XIAOKANG

This year’s CCICED Annual General Meeting examined sustainable industrial development and China’s goal of xiaokang—an “all-round, well-off society.” Sustainable industrialization will contribute both jobs and national wealth. And, an educated, informed public will be an outcome of a socially well-off society. Yet we warn that, unless there is much greater attention to environment and social needs, China may not be able to manage impacts of the desired four-fold economic growth over the coming two decades.

For example, projections in Jiangsu Province are that for a quadrupling of industrial production by 2020, water consumption could increase 1.6 times, and chemical oxygen demand (COD) could increase 2.6 times. Sulphur dioxide released into the atmosphere might increase 1.8 times. There is a real danger within China of slipping into conventional industrialization models based on “rapid growth now, clean-up later.”

We care about the future directions of China’s economic growth and development and worry about their consequences. Two decades of compound growth in use of energy, water, and environmental resources have placed China among the planet’s top polluters and importers of oil. Scarcity of water, timber and other natural resources is already evident. Efficiency in use of energy and materials, even for many new industrial operations, is below international benchmarks. Environmental impact per unit GDP will have to be reduced to a sixth or a tenth of current levels for there to be acceptable levels of environmental quality.

China has some unique advantages. One is the history of a unified state, now capable of finding the right balance between administrative measures and market forces. Therefore it should be easier than in some other countries to control unsustainable production and consumption. And China can build for its future, not simply retrofit the past—the very expensive route of already-industrialized countries.
The biggest risk for China is to become locked into unsustainable development paths, with a permanent underclass of discontented citizens. With so much of the new industrial, energy and transportation infrastructure having a lifespan of 30 to 50 years, decisions made now about the drivers of economic growth and about technology choices will have an enormous impact on future options. We fear that some of these decisions, for example a number related to energy infrastructure, are following conventional lines that will delay introduction of more efficient and environmentally friendly options.

**SUSTAINABLE PRODUCTION AND CONSUMPTION—A “CIRCULAR ECONOMY”**

Of great significant for *xiaokang* and sustainable development will be China’s influence on consumption patterns of its citizens. The rush to build economic growth strategies around the private automobile is an example of how good sustainable development intentions may be sidelined, and unsustainable consumption encouraged. Smog from cars will wipe out current gains in urban air quality. Land for roads will consume agricultural lands. And China may become dangerously dependent upon imported fossil fuels. The growing number of luxury vehicles in large cities widens rather than reduces the gap between rich and poor.

China’s initial efforts towards a “Circular Economy” are consistent with the ideals of *xiaokang*. There is now an urgent need for a much greater commitment to *reduction* in material and energy use, *recycling* and *reuse*, through a combination of law and incentives, education and action in all parts of the country. Full participation by industry of all scales, large, medium and small, is needed. The information society and new patterns of sustainable industrialization need to become mutually supportive.

The 3 E strategy of government is sensible: four-fold economic development by 2020; energy security—avoid becoming overly dependent on oil and gas imports; and environmental protection—attention to public health, ecosystems and climate change. But the relationships among the three elements are poorly developed. Indeed they are threatened by the rapidity of change, and by a heavy infusion of conventional approaches that have not led to sustainable development elsewhere in the world.

Advanced science and technology, including development of a thriving environmental protection industrial sector, will be needed to support a society dedicated to *xiaokang*. Advanced technologies such as modernized use of coal offer the opportunity for meeting near-term environmental and energy security goals at lower costs than with “business-as-usual approaches.” It is very encouraging that China is becoming one of the world’s leaders in research and development investment. Much more is needed in human capacity development in order to maximize the value of this investment.
SUSTAINABLE INDUSTRIALIZATION

We are encouraged this year to learn of further progress towards a good basic framework for sustainable development action—the Cleaner Production Law and a new legal framework for environmental impact assessment; practical application of Circular Economy ideals in eco-provinces such as Zhejiang, and leadership provided by major companies like the An’shan Iron and Steel Group. These and other examples provided by several CCICED task forces demonstrate that vigorous and successful action is possible. The problem is not the lack of good models for sustainable development. It is their consistent and widespread application across all provinces and in all regions.

The commitment to sustainable industrialization by the 16th Party Congress needs rapid follow-up to fundamentally transform Chinese industry at all scales from SMEs to large multinational operations. Sustainable industrialization requires:

- A “level playing field” on which all industries, whether state-owned enterprises or not, can compete fairly.
- Consistency in application of regulations.
- Full participation in environmental protection by enterprises of all sizes and throughout the country.

Currently these conditions are not being met. Thus, while many tools for environmental protection are now available to government and industry, they are not being adequately or uniformly applied.

Better interaction and cooperation between government and business is crucial to make environmental protection work well.

Environmental protection and social responsibility are part of the business philosophy of successful enterprises, as evidenced by leading multinational corporations such as members of the World Business Council on Sustainable Development. Yet, with some exceptions, this view has not taken hold among the majority of Chinese private sector and state-owned enterprises. The general policy recommendations and work of several task forces address this problem in some detail.

Government’s role should be to provide an enabling framework of well-enforced laws and regulations, to correct market failure, and, selectively, to provide incentives for businesses of all sizes to engage in cleaner production. In addition, government needs to support innovation strategies for new products and eco-efficient industrial processes. It also means carrying out reforms in the financial sector so that banks and investment bodies can be part of the solution. Marketization—breaking up the governmental monopoly structure—could be helpful, but only if sustainable industrialization is explicitly dealt with in this process.

Sustainable industrialization will have several important advantages. Industrial enterprises will be eco-efficient, with very low energy and material consumption. Industrial activities will introduce new options for growth that reduce rather than contribute to environmental debt. Sustainable industrialization should produce the same
or greater levels of new employment and wealth creation as offered by conventional industrialization. But a sustainability path provides additional benefits not likely to be achieved otherwise. These benefits will position Chinese industry to:

- Remain internationally competitive.
- Expand into tertiary industries that are less environmentally intensive.
- Meet domestic production goals with far less material and energy inputs.
- Reduce social costs arising from safety, health and environmental consequences of industrial development.
- Tailor public goods and infrastructure development (e.g. transportation networks) to best meet Chinese sustainable development and consumption needs.

**XIAOKANG**

With the goal of *xiaokang*, China is taking the right approach by trying to include all citizens in a journey towards prosperity. Clearly jobs and wealth creation will be critical to success. But the desired well-being also requires a healthy environment, and fulfillment of multiple needs. The lifestyle implications of a *xiaokang* society may be quite different from those found in western industrialized countries. Public awareness and debate can help to shape behavior. An educated, informed public will be an outcome of a socially well-off society. Public participation will help to keep the process of sustainable industrialization and other elements of sustainable development on track.

GDP increase is being used as an indicator for progress towards economic growth that can support *xiaokang*. This indicator needs to be corrected for environmental damage and improvements. For example, public health and environmental damages arising from air pollution alone could rise from 7% of GDP to 13% of GDP by 2020. And GDP is of limited value in addressing issues of equity either regionally or between rich and poor within a region, especially when there is migration.

Emerging concepts such as the Circular Economy are concerned with the quality of economic growth more than the quantity of GDP. Only GDP increments that support *xiaokang*, should be recognized. Those skewing consumption away from sustainability or towards luxury goods for domestic consumption rather than meeting fundamental needs will not be useful in meeting China’s goals. GDP contributions related to expenditures for clean-ups after environmental accidents that could have been prevented present another example of how GDP can fail to give a good measure of progress.

There are many ways in which *xiaokang* and sustainable industrialization can be supportive of each other. Some of these are highlighted in the general recommendations. There is, however, much more work to be done, much of it requiring better measures of progress, and awareness-raising within government, industry and communities.
CCICED TASK FORCES

Five task forces reported to the CCICED Annual General Meeting this year:
- Enterprise Development and Environment.
- Circular Economy and Cleaner Production.
- Energy Strategies and Technology – Transforming Coal for Sustainability.
- Development of a Chinese Environmental Protection Industry.
- Financial Mechanisms for Environmental Protection in China.

Despite the operational difficulties created by travel restrictions during the SARS outbreak, all completed their work and have contributed to the general recommendations. Their detailed policy recommendations are attached to this report, and their full technical reports are available for distribution to relevant ministries.

GENERAL RECOMMENDATIONS

1. **Develop High Efficiency of Material Use and Energy for China’s Sustainable Industrial Economy.**

   Chinese enterprises of all sizes need to become among the most efficient industrial operations in the world if they are to supply growing domestic markets and serve export markets sustainably. There should be full participation of industries from all sectors and all parts of the country. This effort should follow the polluter pays principle and more fully utilize already proven approaches such as eco-efficiency and cleaner production.

   **Circular Economy**

   Efficiency in resource and energy use has to be increased to the point where economic growth targets are fulfilled without expanding material or energy use, and with continuous environmental improvement. China should adopt the concept of a Circular Economy based on reuse, recycling and reduction in energy and material requirements. Consideration should be given to a new law for promoting Circular Economy, broader in scope than the existing cleaner production law. There is a need to integrate circular economy implementation into national development plans, with participation by all relevant departments.

   **Scale of Industrial Enterprises**

   Enterprises of all sizes should participate in environmental protection. But for some manufacturing sectors, including four reviewed by CCICED (cement, refineries, forest products, and sugar), even China’s larger operations are small by comparison to international standards. The size of operations is insufficient to support adequate pollution control investments and necessary economies of scale. There is a need to undertake structural changes for more efficient pollution management, and to increase
manufacturing facility size. Accompanying these changes is a need for improved corporate governance, good performance indicators, and capacity building.

**Modernization of Coal in a Sustainable Energy System**

Coal’s enhanced role in a national strategy for energy efficiency, conservation and cleaner production requires a shift away from conventional combustion to a polygeneration system. Modernization of coal utilization involves large scale gasification of coal and co-production of liquid fuels (e.g. methanol, dimethyl ether), plus other value-added chemicals and electric power. Coal used in this way will have much lower environmental costs. China needs a strategy for polygeneration now—delay means costs from air pollution, energy security issues and higher costs of reducing Greenhouse Gas (GHG) emissions. Most significantly, the large investments planned for electricity in this decade will lock in the mode of coal use in China through 2020 and for a long time after.

Coal modernization should proceed in stages, based on performance and research results. Research and development needs include development of large-scale, high efficiency coal gasifier; efficient engines for methanol and DME; manufacture of large advanced gas turbine; and economic feasibility of polygeneration systems. The electricity grid must purchase polygenerated electricity at a reasonable price that takes into account internalizing of environmental costs. Consideration should be given to designation of Eco-energy regions where experimental applications of polygeneration could take place.

**Technologies for Sustainable Production and Consumption**

New, cost-effective and efficient environmental technologies must be developed and applied. These should be adapted to Chinese enterprise needs, and for urban environmental and transportation infrastructure.

For pollution prevention, sustainable energy systems, and new industrial processes, the commitment to environmental science and technology research and development should be increased substantially. Key areas for investment include:

- High efficiency technologies for resource and energy use.
- Advanced, environmentally friendly manufacturing technologies.
- Green design, selection of materials, construction and operation of buildings and infrastructure.
- Environmentally friendly transportation.
- Byproduct synergy to reduce waste.

These areas can be supported by emerging fields such as biotechnology, nanotechnology and, of course, various information technologies.

China’s growing Environmental Protection Industry (EPI) sector and commitment to a Circular Economy needs to be supported more vigorously by expanding demand, especially through more consistent environmental enforcement, through market incentives, and through stimulation of demand by government’s purchasing power. China’s EPI sector is still relatively small, employing 3 million. EPI could add 1.5...
million new jobs. And, based on the experience of countries such as Japan and Germany, the contribution of EPI to GDP should rise.

Government procurement power is a powerful tool that can be used by China for supporting the adoption of new technologies and sustainably produced goods. Procurement policies should be reviewed so that environmental criteria are given a clear place in decisions. The criteria can include restricting bids to enterprises following best practices in production of goods, recognizing companies meeting standards such as ISO14000, and purchasing materials with a high recycled content. Procurement should avoid direct product subsidies and be compatible with WTO agreements. Environmentally sound procurement policies should operate in conjunction with market reforms such as subsidy reform and environmental taxes.

2. **Make SMEs Full Participants in Sustainable Industrialization.**

Small and medium-sized enterprises contribute immensely to China’s economy (60% of exports, 75% of industrial jobs, new technology incubators) but also account for more than half of China’s industrial pollution. Few are capable of self-financing environmental protection costs, awareness and technical capacity is limited, and they are disadvantaged under current environmental policies. Most are non-participants in pollution control. SMEs throughout the country need to become full participants in China’s sustainable industrialization strategy. This will require a different management approach than might be applied for large business enterprises.

The following measures will help to bring about this participation by SMEs:

- Set guiding principles:
  - Polluter pays principle for all SMEs.
  - Realistic, operational and financially attainable goals.
  - Fair but firm enforcement policies.
- Develop an environmental strategy for SMEs that can be applied in all parts of the country
- Integrate policies for SME development with China’s environment and sustainable development policies, for example by supporting SME environmental action through the SME Development Fund created under the Law for Promotion of SMEs.
- Leverage SME efficiency and access to technology and knowledge through supply chain relationships involving larger businesses—multinational firms, Chinese private sector and progressive state-owned enterprises.
- Encourage full participation of SMEs in regional activities such as Eco-Provinces and various demonstration and pilot projects for cleaner production.
- Establish limited incentive programs to foster SME environmental activities, and for the development of SME environmental protection industries, including soft loans, commercial loan guarantees, paying premium prices for goods and services from SME bidders that conform to environmental laws and meet green standards.
- Promote more use of centralized waste treatment facilities by SMEs, especially in industrial parks.
• Give more attention to the needs of SME environmental protection needs in China’s science and technology policies and activities
• Support capacity building for SMEs including on-site “learning by doing”, building awareness of regulations and compliance needs, fostering peer learning opportunities, ISO 14001 implementation, eco-efficiency training.
• Monitor progress of SME participation in sustainable industrialization in order to determine the need for additional measures.

3. **Strengthen Environment and Sustainable Development Governance Frameworks.**

Governance of sustainable industrialization requires improvement in governance relationships between government, private enterprises and the financial sector. Government needs to strengthen the enabling frameworks for sustainable production and consumption behavior and greatly improve enforcement of environmental law and regulations. Enterprises need to improve corporate governance generally and develop a commitment to sustainable industrialization that starts in the boardroom and carries through into plant operations and all aspects of business. Financial institutions, as part of their reform, need to bring environment and sustainable development into decisions, for example on loans, and investment policies.

**Commitment to Safety, Health and Environment (SHE)**

SHE commitments should be developed as an integrated package in any well-managed business enterprise. There is a need to bring these elements more closely together within government regulatory and enforcement bodies. Laws and regulations require review on how they can be consolidated to address these three subjects effectively for businesses of all scales.

**Reduce Local Protectionism.**

There needs to be a more uniform and consistent level of environmental regulation and enforcement in all provinces of China. In local governance particularly, economic success often is considered more important than environmental quality, health and safety. A predictable, tough but fair regulatory system is urgently needed to overcome regionally-lax enforcement of environmental laws. This system needs give environmental protection and local economic development the same weight. Increasingly, China should be considered as a one-market country rather than a fragmented system of markets.

The existing environmental protection system needs review to clarify local responsibilities for providing supervision and relevant services to support environmental action. The performance assessment system of these government officials needs to place more emphasis on environmental protection. And at municipal levels consideration should be given to setting up independent corporations, operating on commercial
principles, for sewage and waste protection. Consideration should be given to the establishment of independent environmental regulatory authorities if the reform measures noted above are inadequate.

4. **Improve Financial Mechanisms for Environmental Investment and Diversify Sources.**

In the 9th Five Year Plan there was a shortfall of at least 10% for environmental investment and there is concern that without new financial mechanisms in place, the shortfall could worsen by the 11th Five Year Plan. In China some 70% of total environmental investment is via the public sector, while in market economies 60% of pollution abatement is done via private sector sources. Also, there is low efficiency in many of the Chinese environmental investments; SMEs are not attracting funds for environmental protection, especially from commercial sources; and urban environmental infrastructure is not getting enough funding attention. Benchmarks for investment in sustainable industrialization suggest not enough being spent (Japan 20% spent for environmental protection in the 1970s.)

The situation will be improved considerably by changing and diversifying financial mechanisms as noted below.

- Spend on adjustments to remove non-performing and obsolete industrial elements within sectors.
- Remove funding and investment in non-performing state-owned enterprises.
- Broaden range of instruments (corporate bonds, bank credits, trust investment funds, loans).
- Create special funds and incentives for SME environmental protection strategies, as noted in Recommendation 2.
- Through financial sector reform, introduce sustainability criteria for bank loans and insurance guarantees; encourage commercial financial mechanisms for environmental protection.
- Take risk mitigation measures such as loan guarantees to protect banks and creditors.
- Review depreciation policy and other tax measures that may stimulate Environmental Protection Industries and environmental protection investments by enterprises.
- Use foreign direct investment as a more major source of capital for modernization and sustainable industrial development.
- Address underfunding of public investments that are essential for achieving **xiaokang** (e.g. health, education and environmental protection).
- Diversify the financial mechanisms to fund urban environmental infrastructure.
- Link urban environmental and non-environmental projects so developers can do both and therefore spread environmental costs.
- Authorize use of municipal bonds to meet environmental infrastructure funding needs.

These financial mechanisms include a number of approaches already well-linked to decisions of the 16th CPC Central Committee.
5. **Build Awareness and Capacity for Sustainable Production and Consumption.**

China’s efforts for sustainable development and for *xiaokang* should become mutually supportive. Awareness is still lacking, on the part of consumers and on the part of industrial producers, about the broad range of possibilities for achieving a society of modest consumption but well-off living. And the capacity of industry to engage in sustainable production must be built, almost from scratch.

**Awareness-raising**

Public awareness will create demand for improved environmental conditions and services, and possibly also to align purchasing decisions with *xiaokang* ideals and sustainable consumption. There are several key mechanisms that can be employed by the state, including some with private sector cooperation. Among these are:

- Public disclosure of industrial and governmental performance. The periodic publication of a province-by-province national toxic release inventory is an example based on experience from Canada, USA and Mexico.
- Further development of product labeling/certification programs that can guide consumer choice.
- More media attention to better living possibilities through sustainable consumption.
- Educational curriculum development for all grades in schools and for all university students on the linkage of *xiaokang* and sustainable consumption.

**Capacity Building for Industry and Government**

The substantial effort at education and training for eco-educated managers in both government and industry is yielding some impressive results with pilot projects for cleaner production and special activities such as eco-provinces. As well, considerable learning has occurred through multinational enterprises operating in China. Various industrial associations, industrial park managers and others have built capacity to deal with environmental protection.

But capacity building is really still at an early stage. Training needs will grow more complex as new technologies and more stringent standards are introduced. Government officials, particularly those operating at local levels need to be continuously upgraded in order to strengthen both enforcement and market-based regulation.

Several areas of capacity building deserve very high priority in national plans:

- Development of an action plan for sustainable industrialization capacity-building within enterprises and local government in each province.
- Management training for private sector senior and middle-level enterprise staff that includes environmental protection and sustainable development topics as an integral part.
- Community engagement training for corporate staff.
• Inspection and enforcement training for government staff operating at central and local levels of government.
• “Training of trainers” via capacity building of industry association staff.

6. **Improve Indicators and Monitoring of Industrialization and its Linkages with Xiaokang and Sustainable Development.**

Business believes that “what gets measured gets done.” Yet not everything can be measured. Therefore there is an urgent need to develop widely accepted Key Performance Indicators for use by enterprises and government. Some indicators must relate to specific needs such as eco-efficiency measurement, and some to a more comprehensive indicator and evaluation system for sustainable development, including economic growth, material consumption, environmental quality and people’s welfare. China’s statistical system should be modified to incorporate this sustainable development approach. The current reliance on GDP growth as a key indicator for xiaokang needs to be modified to account for environmental and social indicators.

Progress towards sustainable industrial development can be assisted by the use of enforceable performance contracts that can be monitored, using environmental indicators.

There is a need for independent institutions to conduct measurement and information studies and public disclosure such as a toxic releases inventory.

7. **Address Consequences of China’s Rapidly Expanding Impact upon Global Environmental Resources.**

China’s growing dependency on imported oil and natural gas, on imported timber and certain other natural resources raises significant concerns about security of supply, competition with other major importing nations, and international environmental perceptions of China as a resource importing nation. These are matters that relate directly to efficiency issues as discussed throughout these recommendations, and also to xiaokang. China will be far less vulnerable to negative international perceptions and to other factors such as pricing extremes if it is possible to curb growth in imports through domestic strategies of conservation and ultra-efficient use.

These issues can be examined in various ways, for example: modeling to reveal circumstances where projected energy needs can and cannot be met; identifying situations where industrial demands by China might be destroying habitat and resources within other countries, either by imports of raw materials, or through long-range transport of pollutants from China; and vulnerability analysis of trade protectionism, import of invasive species or other impacts. While some of this analysis takes place now, it is not being linked very well to either sustainable industrialization or to xiaokang. It should be. And attention is needed to examine how these aspects fit into China’s broader strategic positioning within a globalizing world.
CONCLUSION

These recommendations reveal a need for a more coordinated approach to decision-making on environment and development. Strengthening regional sustainable development is part of this. It will permit better approaches to land and water resource issues that constrain industrialization. Even more importantly, regional sustainable development can lead to new models for environmental protection, development involving industries of all scales, and more extensive community participation.

Reliable statistics, with overall social, economic and environmental indicators, are needed so that China can determine whether it can manage the consequences of a four-fold economic growth.

There is much potential for development of a stronger relationship between private sector enterprises and government bodies. Out of this relationship could come operational ways for improving corporate social responsibility, and for improved use of market-based incentives.

The success of sustainable industrialization will depend upon how well other components of sustainable development are implemented within China. It will be most valuable if the goal of a xiaokang, a well-off society, stimulates the full realization of a Circular Economy.

We must recognize that we do have the opportunity to achieve both sustainable production and consumption in China, to the benefit of the whole world.