

**Report of the Sub- Committee on
Stimulating Demand for
Indigenous Technology Products**

November, 2002

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1.0 Context

Domestic Policies on Science and Technology, as also development of the indigenous capability for goods and services, are closely linked with the economic growth of the country and most critically with employment of our large and growing labour force. Developing indigenous technology had thus formed an integral part of India's policies over the decades. Self-Reliance as a strategy was adopted since Independence.

Significant progress has been made in several areas, in attaining self-reliance in the past forty years. To achieve this goal, the Indian political economy, during this period, followed a regime of protection to Indian industry. This was essential up-to a particular point. Continued protection beyond that point, when the process of licensing and approvals involved enormous transaction times, acted as a disincentive for the Indian industry to continuously modernize, innovate and be competitive.

This protection has, to a large extent, been removed through a series of changes in Indian Political Economy since early nineties. Compelled by the need to compete amongst themselves and the rest of the world, the Indian enterprises were expected to accelerate their on-going efforts of technology development. After all, the liberalisation policies were formulated with the twin objective of benefiting the Indian consumer with better option of goods and services on the one hand and in helping Indian industry to become competitive in the global markets on the other. It was understood that Indian global leaders could not be developed without being technologically strong. Towards that end, the curbs on the Import of Technology were also phased out.

Two views were debated at the policy formulation stage. One approach was to open the markets and let the Indian industry either swim or sink, and hoping that it will eventually lead to emergence of a few global scale enterprises. The other view was that there was a need to provide guided growth in selected areas and remove the protective walls gradually, so that the capabilities built over a period of forty years are strengthened and opportunity given to at least a few units to become global leaders. The latter quoted the examples of Turkey, France, United Kingdom (UK) who had adopted a gradual and phased approach to liberalization, allowing time to the local industry to adjust to the new market realities.

Current experience-based assessment of the Indian industry shows that the capability built over decades in various sectors is getting weakened. Whatever the intentions of the policy, the ground reality is that Manufacturing Sector in India is losing out on most fronts. Currently, many leading economists and industrialists have pointed out to this skewed development. In contrast, China, they say, has ensured a leading role for the manufacturing sector. Also economists familiar with technological issues are of the view that it is not possible to build a strong economy of India's size based on the service sector alone. According to many, China will dominate the manufacturing sector in the coming decade. An advantage India too had a chance to enjoy; perhaps an opportunity not fully lost. The easy access to imported goods in the liberalised regime has

reduced the demand for domestic goods and services and had in fact pushed the development of indigenous technology and innovation to the background.

In sectors such as in Railways, Power, Telecommunications, Cement, and Hydrocarbons and in some strategic industries, tremendous strides were made during the erstwhile policy regime and India had developed considerable strengths in technology and management. National policies and procedures directed towards greater liberalisation should not let this advantage be dissipated away. In fact, it is possible to strengthen the Indian core capabilities even within the regime of liberalization, if due lessons are learnt from earlier experience of now-advanced countries, and of China, and appropriate measures taken for India.

Over the years, the need has been felt to assess the impact of the new policies on Industrial development and to recommend measures to stimulate the building of domestic capability and create a demand for Indian-made-products. Some of these aspects were examined in a meeting of the Consultative Group of Government Departments / Agencies on Science & Technology (CGDAST) held on 26th June, 2002. It was felt that this issue needed a detailed analysis. To undertake this analysis as well as to recommend the new policy directions, the Office of the Principal Scientific Adviser to the Government of India decided to constitute a Sub committee to study the subject of “Stimulating Demand for Indigenous Technology Products”.

2.0 Terms of Reference of the Sub-Committee

The Office of the Principal Scientific Adviser to the Government of India constituted, vide the order No. Prn. SA/07(03)/2002-Admn. dated 19th of July 2002 (copy enclosed; Annexure 1), ***a Sub Committee on Stimulating Demand for Indigenous Technology Products.***

Shri K.R. Paramesvar, Ex Director General, Bureau of Indian Standards, was co-opted as a member of the Sub-Committee in view of his expertise in quality related issues and experience in technology management.

The committee was required to look into the ways and means by which the demand for indigenous technology products could be stimulated in the country. Among other things, the stipulations envisaged in Government purchase procedures, execution of works as well as the regulatory procedures were also required to be reviewed in order to maximise the supportive environment for products and services resulting from indigenous technologies.

3.0 Report

3.1 The Sub-Committee had the benefit of drawing from the experiences of the members of the Scientific Advisory Committee to the Cabinet (SAC-C) and the CGDAST. Some companies and agencies were also requested to give Case Studies on their experiences with the Government Procurement System. Experiences of the Technology Development Board (TDB), Department of Science and Technology (DST), were also drawn upon in the finalisation of the report.

3.2 Detailed deliberations were held by members in meetings and suggestions were made. Based on these deliberations and suggestions, draft of the report was made and circulated to CGDAST, for suggestions and comments. Some very good comments and suggestions for modifications were received from them.

3.3 On the Sub-Committee's invitation, senior representatives of the three major industry associations of the country, i.e. the Federation of Indian Chambers of Commerce and Industry (FICCI), the Associated Chambers of Commerce and Industry of India (ASSOCHAM) and the Confederation of Indian Industry (CII) also deliberated the initial findings of the Sub-Committee.

3.4 This final version of the report incorporates all the suggestions made by the different people consulted by the Sub-Committee. As shall be evident, a lot of deliberations and consultation amongst the various Sub-Committee and CGDAST members has gone into this report's preparation.

3.5 In the preparation of this report, the demand-stimulating systems of the United States of America (USA), Australia and China were studied and aspects identified which would be of relevance to the Indian situation. *The Annexure 2, giving the Purchase Procedures and experiences of some other countries, may be referred.*

3.6 The recommendations of the Sub-Committee are aimed at enabling or at least creating an environment for a few Indian companies to become global companies and to avoid retardation of efforts to build domestic capability.

A few aspects, which emerged during the analysis of this Sub Committee, are:

- i) Research and Development effort in India had, in the past, been predominantly supported through Government funds.

The user/ industry linkages have always been weak.

Except in a very few cases, commercialisation of products of indigenous technology has been slow and ineffective.

- ii) Traditionally, Indian industry has been seeking technology from foreign collaborations or licensing arrangements with varying degrees of continued dependence on the collaborators. While easing the curbs on foreign organisations setting up business enterprises of their own in India in almost all areas, the compulsions of foreign technology holders to assist their Indian counter-parts have diminished. Also the Government policies have not mandated such partnerships, as is done in a number of countries like China.

The policy changes in early 90s made it imperative for the companies to become globally competitive. Only a few units like Sundaram Fasteners, Ranbaxy, Telco, TVS Motor, Mahindras have taken the challenge and started building up in-house development capabilities and placing own products in the market place. These are

commendable but not adequate to establish Indian industry's global presence.

Although rapid strides have been made and global recognition has come to Information Technology (IT) software industry, even here the IT industry has to do lot more in moving up the value chain – this requirement is recognized even for profit-making units in the IT sector.

- iii) Some very noteworthy technological achievements have been made in the strategic sectors like Defence, Atomic Energy and Space. Unlike in the Western world, spin off of this gain into the civil industrial sector has been few and far between. Such projects were also not evaluated for their cost competitiveness.
- iv) As part of the Ninth Plan, several steps were taken for promotion of Indigenous technology using Science and Technology Advisory Committee (STAC) and Inter Sectoral Science and Technology Advisory Committee (IS-STAC) mechanisms and also through programmes like Programme for the Acceleration of Technological Self Reliance (PATSER), TDB, Home Grown Technologies (HGT), Technology Information, Forecasting & Assessment Council (TIFAC) Missions, etc. These initiatives have started yielding some results in diverse areas, but we have to go a long way. This effort has to be kept up.
- v) The indigenous technology will need to fulfill the industry requirement on an on-going basis, as the protection to the industry is no longer available. Thus, the challenge is to generate an appropriate mix of innovative technologies. The thrust will be on the delivery of products and services developed using S&T infrastructure on which investments have been made in past forty and more years and simultaneously meet the changing customer needs.
- vi) As mentioned by the Prime Minister in his inaugural address at the 89th Session of the Indian Science Congress Association in Lucknow on 3rd January, 2002, the development of indigenous technology and use of products based on it brings several intangible benefits to the nation. It would be relevant to quote the following extract from his address:

“ Science and Technology are undoubtedly a critical input for India's all-round development. Many of the most visible triumphs of post-independence India have been based on the fruits of Science and Technology. But the development of India's S&T capabilities also brings an important intangible benefit to our nation. They give all of us a high degree of self-confidence. And self-confidence, as all of us know, is itself a crucial input for the success of any endeavour in any field of nation building.”
- vii) Another important aspect is the declining strength of “Manufacturing“ activities in India. The liberalisation has created an easy route for imports. India has spent enormous amount of resources in the past in importing technologies in a wide variety of manufacturing industries.

What is now required is to build on the strengths already developed. ***The ownership of enterprises has no significance, without the concurrent ownership of technology. Thus building up and supporting of indigenous technology base in selected economic areas of activity is a pre-requisite for a global leadership.***

- viii) In a recent Special Research & Development (R&D) Report published by the Institution of Electrical and Electronic Engineers (IEEE), a leading professional association in USA, it was noted that while economic cycles go up and down, there is a need for steady investment by Government and Industry in R&D or risk being swept away in the next wave of innovation. It has observed that Government support in USA has reduced from 70% to 50% in last twenty years and is one of the causes for loss of technological leadership in civilian industrial technology vis-à-vis Europe or Japan. The Report in its conclusion mentions “The success stories are exceptions to the rule. While growth seems to be spreading slowly in the wake of spreading R&D investment, much of Africa, Latin America and the less prosperous parts of Asia have been left behind.”

Incidentally, there is no mention of India in the whole report as having made any progress in development of capability or in innovation. There is a genuine danger of India being marginalised in this race for technology development.

- ix) During the course of the deliberations of the Sub-Committee, it was felt that Indian industry is capable of competing with global players in Indian market, provided we ensure that “narrow Self Interest” does not kill “National Interest”.

It is against this backdrop that this Sub-Committee examined the issue of sustaining and creating a demand for indigenously developed products.

4.0 Major Hurdles in Growth of Indigenous Technology based Production

Some of the hurdles in the use of Indigenous Technology based Products, that were brought up during the deliberations of the Sub-Committee are:

- i) One of the major bottlenecks in the development of indigenous technology is the existing procedures in most of the socio-economic ministries/ Departments of the Government, which stipulates that the Indian bidder would qualify only if it /he/she had supplied products/systems in the international market or have a foreign collaborator. This stipulation is seen as a tendency to keep out the Indian products and needs to be reversed. Instead, one should encourage establishments with products and services with reasonable content of indigenous technology, so long it is offered by a reputed organization or the products backed by adequate technology support and tested to international standards. For this purpose, the outdated purchase procedures, inhibiting the use of Indian products, need to be changed.

There are many instances of even developed countries like USA, France etc providing purchase advantage to domestic manufacturers. The revised procedures will help in creating the initial market of the products and services resulting from Indian R&D. This is also one reason why products based on Indian R&D have very little out-reach. Some of the practices adopted by China at present can also serve as a model.

- ii) Government Purchase Procedures: Government continues to be a major customer in several areas of economic activity. As mentioned earlier, the Purchasing Organisations under the Government have certain stipulations, which makes it particularly difficult for Indian companies to quote for their tenders. Thus a change in Purchase Procedures is essential. *Annexure 3, gives the salient features of the comments received on the subject.*
- iii) Even in conventional areas, R&D activity continues to be abysmally low. This is reflected in continued dependence on the foreign collaborators for updated designs even after several years of license agreements.
- iv) Slow pace of up-gradation of manufacturing processes, quality systems and low customer focus: Best technology may not be adequate if it is utilized in an outmoded facility. Policy should aid the up-gradation of manufacturing processes & quality systems and increase customer focus.

The above pre-supposes that given an enabling environment, Indian enterprises can graduate to World Class. The reform process so far has helped in creating the environment to a large extent. However some aspects, which have been delayed, may stand in the way e.g. Labour law Reforms.

5.0 Connected Issues not addressed in this Report

The present Sub-Committee, due to its focus on the immediate problems of indigenous technology products, did not analyse in depth, several other related and important issues which have a bearing on the successful implementation of its recommendations. Government must take immediate steps to examine these issues. The more important among these are listed below:

- i) Military-Civil “Dual Use” Technologies: It is a well-established practice world over to encourage and support dual use technologies through Government funding and development projects. In most developed countries, majority of such production and development efforts takes place in Private Industry. The artificial division between Government and Non – Government establishments in such areas has continued in India for too long. In a liberalized and globalized Indian economy, private industry will have to play a more active role. Some small steps, like higher level of sub-contracting, have begun. The pace needs to be accelerated and some radical changes are needed. Artificial separation of efforts and agencies for strategic and commercial R&D would only put the nation at a disadvantage and raise the cost of R&D.

- ii) There is an urgent need to review the structure and role of Scientific and R&D Establishments. Proliferation of decision-making and funding agencies, only fritter away the resources and perpetuate the pre-liberalization modes of management of technology with a “Commanding heights“ role for the Government. It is true the interest shown and capacity acquired by the industry to substitute the erstwhile Government role is not up to the mark. Industry associations must play a role in changing this mindset and reversing this situation. Government must appreciate the future role these Associations must play and make efforts to ensure their involvement at all stages.
- iii) Industry- R&D institutes-Government interaction has been a subject of many committees and seminars, with little change in ground realities. It would be worthwhile examining specifics in a few high priority sectors/technologies. A good beginning has been made by HGT, TIFAC Vision 2020 Missions, TDB, DST Drug Programme, National Accreditation Board for Laboratories (NABL) and the New Millennium Indian Technology Leadership Initiative (NMITLI) Scheme of the Council of Scientific and Industrial Research (CSIR). In most of these policy areas and institutional activities, Industry Associations, large enterprises and leading educational institutes must assume higher responsibility.

Since these are very vital, but complex issues, a thorough study is needed. The Office of the Principal Scientific Adviser to the Government of India could also consider enlarging the scope of the present Sub-Committee to take up some of these issues for further study in depth or remit these issues to some of the research organizations in New Delhi.

6.0 Specific Recommendations of the Sub- Committee

Taking all the above factors into consideration, this Sub-Committee would suggest for further consideration a few immediate steps. The recommendations of the Sub-Committee fall broadly, into the following five categories:

Item 1 – General Industries

Government, as a major purchaser or influencer, can institute many other enabling measures through review of procedures. Such mechanisms should be evolved – be it through purchase contracts, advance notice of specifications etc. – so that indigenous technology developers can be facilitated in their competition with their foreign counterparts.

Purchase procedures should be modified to encourage Indian/ India made products. This practice is prevalent in all countries. The Government may implement laws or procedures to protect indigenous technology on lines similar to the USA [where in the Public Law 100-202 had enforced that by the year 1992, 50% of Polyacrylonitrile (PAN) – based carbon fiber used in Department of Defence Programmes would have to be made in the USA from domestic precursor. Also ‘Made in America” law stipulating certain local content may be done in select sectors].

When users (especially large users) plan to introduce new specifications in forthcoming tenders, they should discuss these with Indian companies and give them an opportunity to develop the technologies before introducing such requirements in the tenders [example: Performance Analysis, Diagnostic and Optimization (PADO) system for Power Plants].

Where indigenous products have been developed, an opportunity for field trials should be given by the users.

Certification agencies in India should be strengthened and their facilities brought at par with those of the international agencies (such as KEMA, Netherlands, CESI Italy, IREQ, Canada etc.) The agencies should preferably be in private sector in a consortium mode and professionally managed, though initially funded by the Government. This is likely to result in savings in testing costs and reduction in the development cycle time for indigenous products.

In the past, considerable efforts have gone-in to develop domestic capability in producing goods and in providing services for the economic growth. Much of it was through selective collaboration arrangements, which provided access to the technology. Thus, a good degree of self reliance has been accomplished in many areas, notably in Energy related fields, such as Power Generation, Transmission & Distribution, Petrochemicals, Transportation, Machine Tools, Control and Instrumentation, Textile Machinery, Auto components and generally in the Capital Goods industry.

It is debatable whether all the Indian counterpart organisations – both in Public and Private Sector – have established in good time development centers in India to build upon this imported technology to meet the challenges of the future. In the changed liberalised regime, some of the foreign collaborators/ partners have pulled out of their association in the hope of establishing direct supplies to Indian customers.

Nevertheless, there are a number of organisations that have developed the capability to adapt and up-grade their products to meet the growing and changing needs of the customers. As a case in point, Bharat Heavy Electricals Limited (BHEL), which had supplied Power Transformers of 400 kilovolts (kV) class for over 20 years is in a position to offer the next higher rating i.e. 765 kV class and such organisations should be encouraged on the strength of their intrinsic capabilities.

There are other similar instances like Telco developing the Indica car on their own strength and TVS Motors putting in the market the most successful Victor motorcycle developed by them.

There are cases in the government or the Public/Private Sector – where the technology has reached a stage of being commercialised as a product or a system. Enough experiential base and proven systems are also available to evaluate and support these claims to give better confidence to the users.

For such cases where technology development is mature at pre-commercial launch levels, it is important that the matter is taken-up at higher level in the Government for evolving simplified procedures to encourage indigenously researched products, especially when the Government is the buyer or is funding the projects.

In the case of emerging technologies like Biotech, Herbal products, Alternate medicines and Information Technology, similar solutions will have to be found and approved as a standard procedure for adoption.

Some of these solutions are elaborated below:

i) General

- The elimination of the requirements of prior field experience is strongly recommended for all types of indigenously generated products that satisfy the specifications and other test requirements normally stipulated by the user.
- To help smaller industries, create proper testing facilities (for each sector of the industry) and multiple certifying authorities so that users feel confident of the quality of the products and the industries can satisfy the users, without the hassle of running all over the country to find proper facilities.
- Manufacturers should be encouraged to export products made from indigenous technology. Export of such products will, in itself, create pull in the Indian market. There could be special help, not subsidies to win markets (e.g. advertisements abroad, special meetings with foreign buyers, Brand India Fund etc.).

ii) Biotech Products

- In case of Biotech products, it is recommended that conditions of market experience should be waived for the Indian manufacturers using indigenous technologies. User departments and agencies must take into consideration the rigorous quality control and clinical trials already carried out for the promotion of such products, by the Indian manufacturers. These procedures and tests compare favourably with those of their imported counter parts. All rDNA and Biotech products manufactured indigenously and through local R&D efforts should be given preferences by the Government Departments for procurement where no commodity assistance is involved. The first indigenously produced rDNA Hepatitis – B vaccine should, thus, be given preference in the State and Central Immunisation Programmes for the promotion of indigenous industry.
- Indigenously produced Biotech products, which are having a very small market in comparison to generic drugs, should be kept out of price control till the Indian Biotech Industry grows sufficiently

large to compete with others on level playing ground in the market. This will generate competitiveness and indigenous units will invest more resources on R&D efforts.

- The public sector units, which have been central to the nation's philosophy of industrial development, should be given priority for their products. The need for the World Health Organisation (WHO) or any other international agency certification criteria may not be insisted upon by the Government buyer Departments/ Agencies, especially when the National Regulatory Authority has satisfactorily certified the premises/ products under the Drugs & Cosmetics Act and Rules. Wherever necessary, the testing and/or inspection procedures that Indian certifying agencies follow can be reviewed and continually brought on par with international practices.

iii) Other High Tech Sectors

- For other products, similar provisions will have to be categorically made for knowledge intensive emerging technology based industries such as nanotechnology, advanced materials, photonics, robotics/ artificial intelligence, etc.

Item 2 – Strategic and Defence Sector

It is desirable to form “strategic alliances” between defence technology developers, whether they are in the Defence Research and Development Organization (DRDO) or in the Department of Defence Production and Supplies (DP&S), and private firms of good standing and stability.

The aims of such an alliance could, inter-alia, include the following:

- a. Clear understanding among partners that a strategic alliance is a long term partnership, not a short term alliance, in which partners from the Government and private sectors benefit from mutual technological / managerial / financial strengths; with reasonable returns on investment.
- b. Fostering the spirit of partnership in the development, test, evaluation and clearance of prototypes, with appreciation by industry of risks in the development cycle and by Government of due returns on industry investment.
- c. A commitment by the Government to foster such alliances with appropriate procurement guidelines and promote with attractive fiscal incentives in the development phase.
- d. A commitment by the Services themselves to be active associates in such alliances by setting “realistic specifications”, reducing and optimizing the trials cycle as well as dropping of the “moving goal post” approach to indigenous systems.
- e. Selectivity by alliance partners in the choice of development and production programmes so that the preferred focus is on new, advanced systems needed by the services in the medium and long term periods; to the extent possible, laying of emphasis should be

on products and sub-systems which could meet multi-service requirements.

- f. Reduction in time for development, production and induction of products meeting realistic requirements of the services; and cost-effective product support.
- g. Satisfactory resolution, at the development initiation stage itself, of the procurement of a cleared product by the Services to shield against priority shifts in the services and vagaries in budgets.
- h. A “mediated and reasonable” sharing of costs by alliance partners in the development, testing, evaluation, clearance and production phases.
- i. Adoption and implementation by private firms in such alliances of satisfactory physical, personnel and information security procedures.
- j. Encouraging and implementing “spin off” of defence technologies and products from the DRDO / the DP&S in applicable civil sectors – with the private sector taking the lead in consultation with the DRDO / the DP&S.

The feasibility of harnessing capabilities and strengths of the private sector in mitigating some of the “delay-causing” factors arising in the era of denial-regimes was discussed as an additional aim for strategic alliances. It was pointed out that a large number of “controlled” electronic components meeting military specifications have been successfully indigenised with the participation of Indian industry. Similar efforts have fructified in other defence technology areas as well. Members recommended that a consortium approach, with industry participation in a national programme aimed at “Component Independence” and further reduction in vulnerability, be pursued.

The alliance should work in the “cooperation” mode and the following could be considered by the Government, within the overall alliance aims listed above:

- a) A private firm or consortium could take over and turn around an “unhealthy” defence establishment under appropriate terms and conditions. Such an establishment could be in the R&D or production sector which faces manpower or other difficulties but with the potential for revival to service military and civilian needs.
- b) Government could also enable a “healthy” Government R&D or production establishment to be run on more effective and efficient lines by inducting a new professional partner from the private industry.
- c) In promising “dual use” areas with a significant potential for technology upgradation to international levels and competitiveness through R&D, Government could fund the creation and operation of advanced enabling facilities or critical infrastructure in the private sector.
- d) Government could support the establishment of multiple sources of supply in India if the product volume is very large.

- e) R&D Joint Ventures (JVs) between the DRDO, the DP&S and Indian firms could be encouraged for acquisition of current technologies of relevance from abroad. The fiscal incentives for “R&D Companies” could be availed.

These are areas in which the Indian Industry has some strength and is keen. A number of medium and small electronic industries have formed a consortium called the Defence Electronics Manufacturers’ Association (DEMA) and have successfully interacted with the DRDO.

Some of the other areas that could be considered for implementation in the “strategic alliance” method, to begin with, are:

- Advanced materials
- Communications
- Computer hardware and software
- Simulators

The report of the Joint Task Force – 3 on DRDO-Industry Partnership, constituted by the Ministry of Defence, Government of India, has addressed many of the related issues

Item 3 – Emerging and New Technologies

New projects on technologies can be undertaken tuning them at the conceptual stage itself to the requirements of the users. A few such technologies that can be advantageous to the economy, can be concentrated upon by users and technology providers (be it in Government or industries).

It is necessary to identify such of those areas where the development of technology indigenously should not be compromised. This commitment should be evident from the actions taken in identifying the Indian organization, fostering their efforts in indigenous R&D and monitoring their progress. The areas chosen fall under three types:

- a) Strategically important fields such as Defence, Internal Security, Energy Security and select infrastructure areas.
- b) Fields where India has initial / natural advantage and Indian organization has the potential to lead e.g. Biotechnology, Alternate Medicine, Herbal Products, Information Technology, etc.
- c) The need to have a protocol for clinical trials of ayurveda and herbal medicines, which is, currently, non-existent in the country. Despite having inherent strengths, these systems of medicines have not been able to capture the global, especially the American markets, owing to there being no proper mechanism for their validation / clinical trials. The Government could definitely help in establishing the protocol for clinical trials of the Indian systems of medicine.

Wherever possible, further indigenous technology development itself be sponsored by the users of the products, with the Government involving

major players of the sector in the development of such technology. This practice is quite common in the Japanese and Korean industry as well as in China.

Item 4 – Role of Small and Medium Enterprises

Small and Medium Enterprises (SMEs) have played a vital role in the Indian Economy. They have been responsible for creating significant employment opportunities and fostering entrepreneurial spirit. In the initial years after independence, SMEs were involved in several sectors and the Government had provided many supportive measures, both policy and fiscal. With the onset of liberalization and globalization, a need has been felt to review the role of SMEs in the next phase.

The Approach Paper on the Tenth Five Year Plan has reiterated that there is a need to ensure that policies towards Small Scale Industries (SSIs) are supportive. Policy of reservation of certain products of SSI also needs to be reconsidered. It was recognized that this policy has hurt our export capability in several areas.

In order to evolve a new policy, the following is suggested:

- The reservation, so far, for SSIs has been for complete products. Many of these products are now allowed for free imports and due to severe competition, particularly from China, a large number of SMEs are finding it difficult to survive.
- Considering the important role of SMEs in handicrafts and Gems and Jewellery (which involve artistic skills and traditional crafts), the reservation of these products should continue. However, this should be on a very selective basis in keeping with the overall national policy.
- In case of Industrial products, the emphasis in the next phase would be to prepare SSIs to increasingly manufacture components/subsystems that are supplied to Large Units assembling the full product/system.
- The creation of global giants out of Indian companies has to be encouraged. One mechanism of doing this could be to give a select few of existing Indian companies, the status of “**preferred suppliers**”, without denying the other companies any rights or facilities. The selection of those Indian companies that are to be given the status of “**preferred suppliers**” could be done from the existing lists of suppliers to Government departments / agencies by a Selection Committee comprised of eminent people. This list of “**preferred suppliers**” could be periodically revised (based on performance) and the Selection Committee could also include a member each of the FICCI, the ASSOCHAM and the CII. However, while introducing the said mechanism, care should be exercised to see that “**monopolies are not created**”. Other things remaining

equal, such “**preferred suppliers**” may be given preference for the placing of orders by Government Agencies.

- Thus, encouragement should be given to SSIs to become ancillaries, and Sub contractors to large companies. It is possible to do so in the civilian sector as well as in the military sector. Organizations like the Hindustan Aeronautics Limited (HAL) used to have select vendors for small assemblies, materials and components. Such adoption of ancillaries should be increased manifold and also the major companies should help in updating the technologies and management of the companies in keeping with changes in markets and technologies.
- The policy for promoting SSIs to become ancillaries could be similar to that of China. In order to encourage SSIs to become ancillaries, a whole process – along the lines of the Andhra Pradesh Technology Development Centre – should be instituted. A fund can be created, by an initial contribution from the Government and the major industry associations, for being maintained as a corpus for encouraging SSIs to become ancillaries. The maintenance of the corpus would require the employment of the best talents in the country vis-à-vis the involved marketing efforts.
- SSIs should manufacture special components for which technology import should be freely permitted. The main Unit should assist the SSIs in selection and absorption of technology.

Item 5 – Incubation of High Tech Industries

There is a need to share the risks associated with emerging technologies and their converting to commercial products and processes. Considering that some of these require large resource commitment, it is imperative that in addition to the Government, several agencies will need to get involved. Managing large development projects requires considerable skills in Project Management.

The following modalities are suggested:

- i) The user and equipment suppliers should formulate the long-term road map for the technology jointly and identify various underlying innovations required for it to succeed.
- ii) There is a significant component of basic research, which is necessary before applied/ product related research is tested. Thus, involvement of Research Institutes is critical from the inception. The concept of Contract research with clear deliverables will need to be adopted even for some of the basic research projects.
- iii) Recently a few experiments have been attempted for funding such incubation projects through CSIR coordinated NMITLI Scheme and by the DST under the National Science and Technology

Entrepreneurship Development Board (NSTEDB). This methodology could be suitably adopted for other sectors also.

- iv) Similarly, projects like the establishment of National and Regional Herbal Incubation Centres in the country, being pursued by the Office of the Principal Scientific Adviser to the Government of India, may be encouraged and replicated.
- v) Several financial institutes provide resources for emerging technology development. Such Venture Capital agencies have strong project monitoring, evaluation and monitoring systems. It would be useful to canalize the Government funds for technology incubation through one of these agencies.
- vi) The Project Nodal Agency for such incubation initiatives should, preferably, be outside the Government.

7.0 General Recommendations

Certain technologies are available at laboratory scales with Government or Government supported institutions such as the Indian Institutes of Technology (IITs), the Indian Institute of Science (IISc), the CSIR and the DRDO Laboratories, etc. The users/ user organizations are often not aware of these. It is seen that only a few of these available technologies have been adapted to suit Indian needs. Policy makers and programme managers should systematically be kept informed by the technology generators about the status of indigenous lab level technologies developed by them in a manner, which is comprehensible and relating to the needs of the users.

There are several examples where technologies developed in India were pushed aside and forgotten till they came back to the country, via the West, in the 1990's. The Indian Council of Medical Research (ICMR) has given few such examples. In order to ensure that such lab level technologies do not die away, at a very early stage, those responsible for such institutions should open up communication channels with potential users and inform them in a manner that can be comprehended. If necessary, professional agencies be hired and special budget provision be made for the same. This is very vital in case of emerging fields like Biotechnology, Ayurvedic and Herbal Products as well as other knowledge intensive areas like advanced materials, nano-technology, etc.

Lack of information on Indian products and awareness of their advantages need to be addressed. Some solutions are:

- A focused and sustained marketing of technologies (to industry users likely to adopt the technologies) is required.
- A distinct effort for product marketing, through use of enhanced brand image, certification is also required.
- The Government of India can consider giving commitment to indigenous technology by enforcing Government departments and agencies to source at least 20% of their purchases from SMEs.

- When Indian indigenous products are equal to overseas products in terms of value for money and other criteria, then the said Indian products must be purchased especially by Government Departments and Agencies.
- The Government may conduct research into Commonwealth Government buying trends and their implications for Indian SMEs in order to enable HGTs to make in-roads into the markets of the Commonwealth countries.
- At the national level, periodic in-depth analysis of the cost effectiveness of major R&D Projects needs to be taken up. In the past, such projects have continued in an open-ended manner. We should not shy away from abandoning projects if they do not prove to be cost effective.

**ANNEXURE 1 TO THE REPORT OF THE SUB-COMMITTEE ON STIMULATING
DEMAND FOR INDIGENOUS TECHNOLOGY PRODUCTS**

No. Prn.SA/07(03)/2002-Admn.
**Office of the Principal Scientific Adviser
to the Government of India**

310-A, Vigyan Bhavan Annexe
Maulana Azad Road
New Delhi - 110011

Dated the 19th July 2002

ORDER

Subject : **Sub Committee on stimulating demand for indigenous
technology products – constitution of.**

One of the measures/initiatives taken to achieve Ninth Plan objectives was the promotion of indigenous technology. While trying to increase the momentum to promote indigenous technology during the Tenth Five Year Plan the approach has also to take into account a new situation that has emerged for our industries with the opening up of the economy. We are heading for a strong globally competitive environment. WTO (World Trade Organization) regime will also apply in a number of cases. Therefore the approach to indigenous technology will have several new features. An appropriate mix of innovative technologies will have to be generated in addition to 'catching up'.

2. The third meeting of the Consultative Group of Government Departments/ Agencies on Science & Technology (CGDAST) held on 26th June 2002 considered the issue of stimulating demand for indigenous technology products and decided to constitute a sub committee with Dr. V. Krishnamurthy, former Member, Planning Commission as Chairman. The composition of the sub committee would be as follows :-

- | | | |
|----|---|------------|
| 1. | Dr. V. Krishnamurthy
Former Member,
Planning Commission | - Chairman |
| 2. | Prof. V.S. Ramamurthy
Secretary, DST, Govt. of India | - Member |
| 3. | Prof. R. Natarajan
Chairman, AICTE, New Delhi | - Member |
| 4. | Shri Dipankar Basu
Secretary (C & PG), Cabinet Sectt. | - Member |

Contd.....2

5. Shri K.K. Nohria - Member
President, ASSOCHAM
6. Dr. V. Siddhartha - Member
Adviser (ER & IPR), DRDO HQS
7. Shri Y.S. Rajan - Member Secretary
Scientific Secretary, O/o PSA

3. This Sub Committee shall look into the ways and means by which the demand for indigenous technology products could be stimulated in the country. Among other things, the stipulations envisaged in Government purchase of systems or execution of works as well as other regulatory procedures would also be reviewed in order to maximize the supportive environment for products and services resulting from indigenous technologies.

4. The Sub Committee is requested to submit its report by mid – September 2002.

5. This issues with the approval of the Principal Scientific Adviser to Government of India/Chairman-CGDAST.

Sd/-
(Y.S. RAJAN)
Scientific Secretary
Office of Principal Scientific Adviser to the Government
of India

ANNEXURE 2 TO THE REPORT OF THE SUB-COMMITTEE ON STIMULATING DEMAND FOR INDIGENOUS TECHNOLOGY PRODUCTS

Purchase procedures and experiences of other countries

1. *Salient features of a Staff Paper prepared in June, 1988, by the Oceans and Environment Program, Office of Technology Assessment, United States Congress, Washington, D.C.*
 - 1.1. The Office of Technology Assessment, United States Congress, Washington, D.C., was requested by the Subcommittees on Interior and Related Agencies of the House and Senate Committees on Appropriations to examine the trend of foreign manufactured and fabricated facilities displacing facilities of U.S. origin in development of oil and gas resources on the Outer Continental Shelf (OCS). The Staff Paper examined the current and future prospects for U.S. offshore oil and gas development. In particular, it analyzed the opportunities available to some major segments of the U.S. offshore industry – the U.S. builders and fabricators of offshore rigs and platforms. It discussed the problem of foreign competition for construction of rigs and platforms and also evaluated some of the impacts of the then trends.
 - 1.2. According to the Staff Paper, U.S. rig and platform builders had experienced serious reductions in their business over the five-year period preceding June, 1988, caused mainly by a major slump in offshore oil and gas exploration and development work, though overseas competition for the construction of rigs and platforms was continuing to grow then. According to the Paper, substantial foreign content was then evident in some of the largest and most technically advanced equipment used in offshore petroleum exploitation, a major commercial enterprise that had originated in the United States in the 1890s when first attempts had been made to drill beneath the sea.
 - 1.3. The analysis done in the Staff Paper was intended to assist the United States Congress in its consideration of “Buy America” legislative proposals that would have required a percentage of domestic content for offshore oil and gas drilling and production systems deployed in U.S. waters. According to the Paper, the latest proposal, for instance, would have called for platforms, rigs, vessels, etc. used for exploration or production of oil and gas on the OCS to be built with at least 50 percent of person hours expended in the United States and from materials at least 50 percent of which are mined, produced or manufactured in the United States.
 - 1.4. This Staff Paper had presented the analysis in five sections. The first had addressed the status of offshore development and the industry sectors affected by this issue. The next two sections had presented trends in the contract drilling and drilling rig construction industries and in the production platform operator and platform

construction industries. The fourth section had discussed several topics important to overseas competition such as costs, foreign subsidies, foreign capabilities, supply of special steels and domestic content practices of other countries. The last section had discussed the impact of foreign construction on U.S. jobs – especially in the platform fabrication sector of the industry.

1.5. The Paper had concluded by observing as follows:

“In sum, future foreign construction of offshore production platforms in U.S. waters could have the effect of putting several thousand direct U.S. fabrication industry jobs at risk over the next decade. In addition, a substantial number of indirect jobs would also be affected. The above list illustrates several categories of other related jobs usually involved in all aspects of developing an offshore project. OTA has not determined the level of U.S. or foreign competition for those related jobs, but it appears unlikely that they would be greatly affected one way or another by a decision to build a platform overseas rather than in the United States. On the other hand, some foreign content is evident in some of these other job categories such as pipelines and installation services. Further investigation could uncover a more accurate estimate of future jobs at risk”.

2. *Salient recommendations, as contained in Report 369, Australian Government Procurement, Joint Committee of Public Accounts and Audit, The Parliament of the Commonwealth of Australia, June, 1999.*

Recommendation 1

That the Department of Finance and Administration develop and administer an accreditation system for assessing the purchasing performance of individual agencies.

Recommendation 2

That Financial Management and Accountability Regulation 8 be amended to read that 'An Official performing duties in relation to the procurement of property or services must act in accordance with the Commonwealth Procurement Guidelines'.

Recommendation 3

Measurement of the performance of the senior management, including Chief Executive Officers, of Commonwealth agencies should include reference to how efficiently and effectively the purchasing function is administered, and whether agreed objectives are being met, such as ANZ content and the commitment to maximize opportunities for SMEs.

Recommendation 4

The decision made in Commonwealth Procurement Circular 98/3 to change from mandatory to best practice the requirement that all persons undertaking procurement functions meet appropriate Commonwealth Procurement Competency Standards should be reversed immediately.

Recommendation 5

The Department of Finance and Administration and the Office of Small Business develop and agree on appropriate definitions to cover small and medium enterprises, and circulate this information across government for universal application. The agreed definitions should be included in the next edition of the Commonwealth Procurement Guidelines.

Recommendation 6

That the Government upgrade its commitment so that Commonwealth departments and agencies will source at least 20 per cent of their purchases from SMEs.

Recommendation 7

That where Australian–New Zealand (ANZ) products are equal to overseas items in terms of value for money and other principles in the Commonwealth Procurement Guidelines, then the ANZ products must be purchased.

Recommendation 8

That, for agencies under the Financial Management and Accountability Act 1997, Model Industry Development Criteria for Major Projects should apply to procurement projects of \$5 million or more.

Recommendation 9

That the Office of Small Business and the Department of Industry, Science and Resources conduct research into Commonwealth Government buying trends and their implications for Australian New Zealand small and medium enterprises.

Recommendation 10

That all Commonwealth agencies, if they have not already done so, sign a memorandum of understanding (MOU) with ISONET. This MOU, among other things, must:

Guarantee lines of communication between agencies and ISONET; and

Include commitments to maximizing the involvement of ISONET in the purchasing process.

An agency will be expected to include, in its Annual Report, confirmation of its MOU, initiatives that it will be taking to increase the involvement of ISONET in its procurement, and an appraisal by ISONET of the agency's performance against objectives set out in the MOU.

Recommendation 11

To improve access by SMEs to smaller purchases, all Commonwealth departments and agencies will publish electronically the reasons why officers have gone offshore for goods and services for all purchases worth \$100 000 or more.

Recommendation 12

That all Commonwealth agencies under the Financial Management and Accountability Act 1997, and government business enterprises report, on an annual basis in their Annual Reports, their performance against key purchasing objectives. This information should also be made available on agency internet websites and be linked to purchasing electronic commerce systems.

3. *Salient features of a Chinese Bid Document for 3G(CC)–GD± 500 kV DC Transmission Project*

3.1. According to the Bid Document, the following equipment and materials in the scope of the Contractor should be or be encouraged to be manufactured or purchased *inside China* according to the Owner's will and the Contractor's designs. For these equipment and materials, the Contractor must ensure that their manufacturing time schedule and product quality fulfill the Project's requirement:

- Converter Transformer
- Smoothing Reactor
- Thyristor
- Converter Valve Section
- Capacitor units of AC filter banks
- Civil structure section, i.e. steel girder, steel panel, cement, etc.
- Hydraulic section, i.e. piping, etc.
- Ventilation and air conditioning, i.e. air ductwork, venting fans, air conditioners, etc.
- Electrical section, i.e. HV and LV switch cabinet, illuming material, etc.
- Others, i.e. sanitary ware, etc.

3.2. According to the Bid Document, the following options for transfer of technology (ToT) are based on the detailed contents, complete plan and the detailed arrangement provided by the Contractor and shall be decided by the Owner whether they will be put into action:

Main Items of ToT and training required by China:

- i) Whole set design of DC project

The Owner's requirement:

- Calculation programme suitable for large power grid interconnection system analysis with detailed DC system model
- Calculation programme suitable to make analysis of AC/DC system electromagnetic transient, electromechanical transient and long-term dynamic stability

- New version of EMTDC electromagnetic transient analysis programme consisting of DC control model
- Electrode design and analysis programme (including analysis of current distribution, electromagnetic interference, grounding and soil structure)
- AC/DC harmonic measuring and analyzing software
- 60 man-month technical training for the Owner including system design and equipment performance specification study for long distance HVDC project and BtB HVDC project
- Electrical and mechanical design information of AC/DC filter
- Other items suggested by the Contractor

ii) DC control and protection system

The Owner's requirement:

- Software and hardware system structure of DC control and protection
- Know-how technology of DC control and protection device
- Control strategy and simulation model for BtB project
- 90 man-month technical training for the Owner including DC control and protection system design and their software and hardware development technology
- Other items suggested by the Contractor

If the above technologies have been transferred to China, the Contractor shall give clear indication and describe whether there are new developments or new contents, which can be transferred.

iii) The Contractor shall also essentially respond for the new technology transfer of other equipment's design and manufacture (including necessary training) needed by China

4. *Details of the Section 8088 of the Public Law 100-202 of the U.S. Government*

4.1. The Secretary of Defense shall take such action as necessary to assure that a minimum of 50 percent of the polyacrylonitrile (PAN) carbon fiber requirement be procured from domestic sources by 1992: PROVIDED, that the annual goals to achieve this requirement be as follows: 15 percent of the total Department of Defense (DoD) requirement by 1988; 15 percent of the total DoD requirement by 1989; 20 percent of the total DoD requirement by 1990; 25 percent of the total DoD requirement by 1991; and 50 percent of the total DoD requirement by 1992.

ANNEXURE 3 TO THE REPORT OF THE SUB-COMMITTEE ON STIMULATING DEMAND FOR INDIGENOUS TECHNOLOGY PRODUCTS

Salient Features of the Inputs Received

1. Salient features of the tender for 66 kV Cable by the Karnataka Electricity Board (KEB)

- 1.1. Some of the minimum qualifying requirements of the bidders, as contained in the tender document published in the year 1999, are given below:
- The bidder should have minimum of five years experience in the design, manufacture, testing, supply of XLPE insulated underground cables of voltage grade 66 kV and above.
 - The bidder should have supplied a minimum quantity of 30 km single core (10 ckt. km) of 66 kV and above voltage grade cable.
 - The bidder should have installed a minimum quantity of 15 km (5 ckt. km) of single core 66 kV and above voltage grade cable and which should be in satisfactory operation for a minimum period of 3 years.
 - The cable joints / terminations offered must be in commercial operation for atleast 3 years as on the date of bid opening.
 - In case the bidder has manufactured, supplied and commissioned 66 kV and above rated underground cable but does not meet the minimum qualifying requirements fully, such bidder can bid with a collaborator.
 - Purchaser reserves the rights to waive the minimum qualifying conditions in case of bidders having collaboration with reputed collaborator whose qualifying experience meets the requirement.
 - The period of qualifying experience shall be reckoned with reference to the date of bid opening both for single bidder and the bidder with a collaborator.

2. Salient features of the tender for 66 kV Cable by the Delhi Vidyut Board (DVB)

- 2.1. One of the critical qualifying requirement of the bidders, as contained in the tender document published in the year 1999, is given below:
- The minimum experience in the manufacture of 66 kV cables and accessories required to qualify bidder for the award of contract is five years.

3. Salient features of the tender for Hepatitis 'B' vaccine under the ESI Scheme of the Government of Maharashtra

- 3.1. One of the critical qualifying requirement of the bidders, as contained in the tender document published in the year 1999, is given below:
- The products for which tender is filled should be in the market minimum for 3 years in case of starred items and minimum 2 years for non-starred items.
