

**A strategy for the TV and Video Equipment Industry
in the former Soviet Union**

**A Report prepared for the
European Bank for Reconstruction and Development**

**Institute of Development Studies
University of Sussex**

April 1993

A Strategy for the TV and Video Equipment Industry in the former Soviet Union

Preface.

This is the report of a mission undertaken in January 1993 on behalf of the Development Banking Division of the European Bank for Reconstruction and Development (EBRD). One part of its task was to report on the prospects for small and medium firms in a sector noted for the large size of its enterprises, as a contribution to the EBRD project to produce a strategy for small and medium enterprise (SME) development in Eastern Europe and the CIS. That is the subject of a separate report.*

It was clear from our discussions, however, that the significance of the TV sector for the economic future of the FSU extended well beyond the question of SMEs. It was one of the main consumer sectors, with an estimated employment of 250,000 people, a demand which had remained remarkably strong in spite of domestic economic turmoil, and a strikingly high level of technological development. This report considers the strategic issues facing the industry.

The mission comprised Robin Murray, Fellow in Economics at the Institute of Development Studies, the University of Sussex, Irene Pilman, a senior researcher at the Institute of the Economy in Transition in Moscow, and three of the senior staff of Snell and Willcox, a rapidly growing medium sized firm in the European TVE industry: David Youlton (Chairman and Chief Executive), Roderick Snell (founder and technical director) and Victor Steinberg (a TVE engineer on secondment from the Moscow Institute of Radio and Television Research). Prior to joining Snell and Willcox Victor Steinberg had been responsible for the drafting of the official plan for the Soviet TVE industry, 1986-1990.

* "Small and Medium Enterprises in the TV and Video Equipment in the former Soviet Union" report to EBRD, February 1993.

The team visited production plants, research institutes and TV stations in Lithuania, Latvia, Moscow, Alexndrov and St Petersburg, and held discussions with recently created small firms as well as a wide range of production and research directors in the industry. It attended and made presentations at a meeting of the main TV stations of the FSU states in Shapki as well as meeting with the Minister and chief scientific adviser responsible for the TVE industry in the Russian government.

Many of those with whom we spoke commented on the number of visits they had had in the past year from foreign missions and international agencies, which had produced little in the way of practical results. This makes us more than usually grateful for the time they spent with us, and particularly to Visvaldas Petraitis, Chairman and Director of the State Television Institute in Siauliai, Lithuania, and Natali Portnova of the Ministry of Science, Higher Education and Technological Policy in Moscow. We trust that positive results will emerge from it.

Executive Summary

The countries of the former Soviet Union are the only region in the world with the autonomous technological capacity and industrial base capable of challenging Japan's dominance of the international TV and audio industry over the next decade. Much, though not all, FSU technology is copied, and some is considerably out of date. The quality and reliability of its products is well below the best Western levels. But the sophistication of its scientists and the close ties between the sector and the military industrial complex, still provide a base from which world quality manufacturing could be launched.

The industry also has major significance for the economic future of the FSU states. In Lithuania, it is the main industry, and includes the second and third largest firms in the country. In Russia, there are 150 broadcasting stations, quite apart from the enterprises producing equipment, programmes, films, and records. In the FSU as a whole we estimate that there are 800 large and medium factories and TV centres employing nearly half a million people. There will also be effective demand for at least 60 million TV sets, and a total industry demand of \$12 billion over the next decade.

In the long run, over a time scale of 10-30 years, the international industry is poised to undergo a digital revolution as significant as that following the introduction of colour TV in the 1960s. This will create a world market for high definition TV and digital broadcast equipment estimated at \$2-3 trillion. FSU industry has the potential to go for a share of this.

At the moment, however, unstructured liberalisation is threatening the industry. The inadequacy of the banking system has led to severe clearing problems, and a virtual absence of affordable credit. The inability to maintain research funding and the real wages of scientists is resulting in the break up

of research teams and a substantial brain drain to the West. The decentralisation of enterprises - which has given much greater autonomy to management - has on the other hand left the industry without a common strategic perspective. Overseas companies for their part are surveying the industry looking for the 'cherries' produced by long years of priority investment. If these trends continue, without countervailing measures, the industry faces a collapse similar to that of the North American and British industries during the eighties, and the Polish television industry over the past two years.

Urgent action is needed to stem this threatened implosion. We propose a five point plan:

1. The establishment of a sectoral development bank, designed to organise intra industry clearing and credit, and to become a strategic focal point for the sector.
2. The production of a detailed audit of the key sections of the industry, and an industrial strategy which commands common support.
3. The negotiation of joint venture agreements in those parts of the industry identified by the strategy, whose aim will be the common development of new technology whose benefits will be shared internationally.
4. The immediate start of a programme of production upgrading, through a series of international enterprise exchange schemes, pilot plants in the new management methods within the FSU, and complementary applied training schemes.
5. The redesign and rebranding of current products for export, and the initiation of a scheme to upgrade the quality of industrial design in the sector.

Our judgement is that there is a clear developmental role that could be played by the EBRD, which, in the initial period,

should take priority over project lending. A number of projects were to put to us, but their long term prospects are critically dependent on developmental investment in 'software':

- maintaining research teams,
- focussing the long term sectoral priorities,
- upgrading production management, design and marketing,
- the organisation and training of industrial labour.

If the former Soviet territories are to re-industrialise, then the TV and audio sectors are a prime candidate for support. They provide a case study of technological potential, and of the positive and negative effects of the reform process. We also hope that they will provide case experience of successful strategic action of a new kind, based on co-operation between the industry's enterprises, the relevant government departments and international agencies.

A strategy for the TV and Video Equipment Industry in the former Soviet Union.

Significance of the TV and audio sector.

1. The TV and audio industry is one of the key consumer durable goods sectors in the former Soviet Union (FSU). It involves not only the consumer equipment itself - TVs, radios, hi-fi and videos - but the substantial cultural production undertaken by broadcasting stations, film and programme makers, recording studios and record publishing houses. These in turn provide a market for equipment, whose technology is closely linked to that of the final consumer goods. The focus in this report will be on the consumer and broadcast TV equipment (TVE) industry.

2. We have no reliable estimates for the overall size of this industrial sub system. What we know is that there is substantial pent up demand for quantity and above all quality of hardware and software throughout the sector.

3. There are an estimated 100 million TV sets in the countries of the CIS and the Baltic states, just under one for every three people. Half this stock is black and white, so that the colour set ratio is one to every six people, compared to a Western European average of 1:2.5.

4. The quality and reliability of the FSU sets is significantly below those from the West, yet even so the strength of market demand is reflected in the fact that despite the crisis of the last two years, domestic TV sales have fallen by no more than 25%, largely because of problems of supply. (see Table 1).

TABLE 1

Production Volumes of TV, Video and Radio Sets in Russia
(1990-1993)

Official Russian production figures (in quantities) are as follows:

	1990	1991	1992	1993
TV sets- Total	4717	4439	3625	3552
Colour	2657	2499	2057	2038
Black and White	2060	1940	1568	1514
Video recorders	457	289	434	444
Radio sets	5760	5500	3935	3487

Source: Ministry of Science, Higher Education and Technology Policy

Note : Industry sources put FSU TV production at 7 million and projected needs by the mid 1990's at 15 million.

5. We estimate that the FSU demand for new and replacement sets over the next decade will be at least 60 million sets, worth \$9 billion, and requiring a 28% increase in output on 1990 levels.

6. There is a similar picture in the field of broadcasting equipment. At the time of the break up of the Soviet Union, there were 92 TV broadcasting centres in Russia, and a further 38 in other former republics. By early 1993 this number had grown by over 50% to 150 TV centres in Russia alone, all of them requiring new equipment. In addition, the majority of the existing broadcasting centres are using old equipment, some of it twenty years old, and are pressing hard to re-equip.

7. The ability of the national and regional networks to invest is circumscribed by the current financial situation, but what is striking is how buoyant this sector of demand has been,

principally in the new states where TV centre investment has been given political priority (in Azerbaijan for example the TV centre was allocated \$100 million from the state budget).

8. If we add to this the likely consumer demand for hi fi equipment, compact radios, and video tape recorders (there are still only an estimated 3 million VTRs in the FSU, far below consumer levels in the West) then the overall demand for TV and audio hardware is forecast to be at least \$12 billion over the next ten years, with substantial software expenditure on top of that.

The future of the industry

9. The main question for the FSU countries is who will supply this demand. Up until now the great majority of domestic TV and broadcast equipment as well as the programming was produced domestically. There is still an extensive and interdependent industry, with research and development concentrated in Moscow and St Petersburg and the surrounding regions, and many of the main plants located in what are now newly independent states. The three main TV plants, for example, are in Minsk in Byelorussia, Lvov in Ukraine, and Siauliai in Lithuania. They received 90% of investment funds during the 1980's. Siauliai has also been the main producer of complete broadcasting systems, and Lithuanian plants are responsible for more than half (54%) of all cathode ray tubes within the FSU territories.

10. With the opening up of the FSU economies to the world market there is a real prospect of the industry being destroyed. This has been the experience of Poland, where the number of TV plants has fallen from 10 to 4 in the past two years. It has also been the experience in the West, as Japanese companies, notably Sony and Matsuchita, have come to dominate the world market. In the UK, where there were 12 British owned plants producing TVs in the early 1980's, there are now none. On the continent only BTS (a consortium of

Philips and Bosch) and Thompson have managed to resist, but much of their equipment depends on Japanese chips, and they are losing market share to the Japanese, as Ampex and RCA have done in the US.

11. Japanese TVE companies have been successful for four reasons:

- they have targeted the independent research capacities of rival economies, offering cut price technology to indigenous firms as a way of discouraging investment in R&D

- they have developed a system of production engineering and management which is noted for the quality and efficiency of its output.

- they have used the profits from their international expansion to invest massively in next generation technology.

- they have developed key components which they only sell as part of a wider package

12. At the moment FSU industry is still heavily protected. Most countries face an acute shortage of foreign exchange, and in Russia at least import tariffs run from 20-60%. Russian producers also have the advantage of nationwide maintenance network. But Sony and Matsuchita have both established a service infrastructure for their machines, centred in Moscow, and have already invested in the Asian Republics. We can also expect a strategic attack on the industry's research capacity, principally that in Russia.

13. Moreover if the current programme of liberalisation extends to lowering the protective barriers, it is likely that the bulk of the \$12 billion market in the 1990s to be met by imports or by joint venture assembly of foreign components. This represents a real threat to the FSU balance of payments, and to those employed in the industry.

14. The core problems for the CIS and Baltic state are ones of quality and design. Domestic Russian TVs are notably inferior to those in the West, partly because they lack key inputs like black stripe technology, and partly because they are much less reliable. There has been a sharp increase of demand for imported TVs, even at three times the price, for these reasons.

15. We also found that, with one exception, all the ten broadcasting stations we talked to expressed a preference for imported equipment, with only the lack of foreign exchange allowing internal demand for broadcasting equipment to be sustained.

16. Yet in the long term we believe that the TVE industry in the FSU territories could become internationally competitive, not only saving on the region's input bill, but earning foreign exchange through exports and license fees. We say this because the industry has underlying strengths, notably its autonomous technological base:

- * it produces its own optics, sensors, decoders and chips.²

- * it has four major TV and radio research institutes, with a number of factory research institutes also expanding rapidly

- * it has five factories producing CRTs and nine others producing glass for the CRT's,

- * in addition to the three largest TV factories, there are 13 others assembling TV sets.

2. We examined a recently designed camcorder which contained over 1,000 different chips, all of them made within the FSU. Other than a Fuji splitter, all components were domestic

There is thus an integrated research and production infrastructure which has a lower import content than any country outside Japan.

17. One of the key factors explaining this strength are the close between the industry and the military industrial complex. Many of the innovations were developed first for military purposes, as were the relevant components - chips, lenses, sensors, and transmission networks. Civil broadcasting is in fact a minor part of the work of the St Petersburg Institute, 95% of which is still directed to military purposes. From the viewpoint of civil industry the close connection to the military sector gives it an advantage, particularly at a time when the emphasis of government policy in Russia and the majority of the CIS states is on military conversion.

18. What the ex Soviet territories have is a core industry whose prime trajectory of technological development has been determined by military needs, but which can without difficulty be re-oriented to the expanding civilian market. There is an awareness in the civil industry that there is considerable 'hidden hi tech' in the military sector, and one of the first tasks is to tap this for upgrading civil production.

The impact of economic reforms and the break up of the Soviet Union

Decentralisation

19 The most immediate result of the economic reforms has been the decentralisation of operational control within the industry. Large complexes are being broken up and established as networks of limited companies. The fiscal crisis of government has led to severe cuts in central funding , forcing

the new companies into a growing reliance on market income for both current and capital spending and reinforcing the formal autonomy of the factories.

20. The changes have also led to the establishment of a new tier of small and medium enterprises - we estimate there are now at least 200 such firms in the Russian TV and broadcasting sector alone, Some are in the research field, often linked to the production of broadcasting system components, while a majority are in broadcasting itself, both new cable and broadcasting companies, and programme production and post-production enterprises.

21. We found that the managers of the new limited companies, both large and small, welcomed their autonomy, even if they were severely squeezed by the cut back in central funds. The research institutes have sought to develop contract research for enterprises, and the TV stations - particularly in the poorer CIS states and regions of Russia - have also been forced to switch their focus to market revenue raising.. The St Petersburg TV station, for example, now earns 50% of its own revenue budget, largely from advertising and the hire of facilities.

22. All the firms visited remained formally state owned, but were in effect being run by their managers. One Russian firm was being treated as a pilot for privatisation in the sector, with majority ownership being transferred through vouchers to the workforce. but at the moment this has had little operational effect.

The break down of financial relations.

23. An added problem for enterprises that are now having to depend on sales income is that the shift to market relations has proceeded ahead of functioning financial structures. This

has become the most pressing problem for the industry. It applies within Russia as well as between the CIS and Baltic states. The enterprises we talked to reported a five week delay in clearing through the Central Bank and its regional clearing centres. With prices rising at 4-6% a week, this meant a loss in the real value of sales income. It also squeezed working capital at a time when commercial bank lending (predominantly geared to short and very short term loans), was running at interest rates of 15-30% a month.

24. The result has been a liquidity crisis at many points of the productive system, and frequent suspensions of production.³ For products which were dependent on many components it was rare to find plants which had not stopped production because of the lack of one or more parts. There has been a consequent fall in capacity utilisation and a rise in unit costs.

25. Between CIS currencies and the rouble the problems are even more difficult, since the circuits through which cash has to pass include the foreign exchange sections of the Central Bank. Russian firms also reported particular difficulties in hard currency exports, because foreign exchange is appropriated by the central government without being passed on to the exporter.

26. There have been four responses to these problems of the financial system. First, as in the earlier era of physical shortages, assembly plants have tried to produce components internally. The Siauliai plant lacked raw materials and chips, but the great majority of its components were produced on site or came from neighbouring plants in Lithuania.

3. We visited a plant that produced chips for a manufacturer of FACS machines. The latter lacked the credit to pay for the chips, nor could the chip maker advance credit to the manufacturer. The result has been the suspension of production.

27. Second, there are extensive bartering systems. Siauliai pays for its rouble imports with TV's, and Chromatron, the Moscow enterprise which sells CRTs for Siauliai televisions, also arranges for the supply of copper wire to Siauliai and pays with TVs. TV sets have thus become an internal currency.

28. Third, as far as foreign exchange is concerned, some firms have been operating back to back financing, whereby foreign exchange earned is lodged in a foreign bank account and either used for hard currency purchasing or lent to other parties in a position to transfer roubles to the exporter.

29. Fourth, a number of industrial sectors have set up their own banks to provide a mechanism for clearing and credit. Of the 1,700 commercial banks set up in the past three years, we were informed that as many as half were established by connected industrial enterprises for this purpose.

Participating enterprises take shares in the bank and then have privileged access at lower rates of interest to credit possessed by the bank. There is no such bank for the TVE sector, although one was established by the Ministry of Communications for its associated enterprises, and the idea had been discussed by some enterprises within the TVE industry.

30. Until a more stable and effective financial infrastructure has been established it is difficult to think in terms of medium and long term lending on commercial terms. Many of the enterprises to whom we talked said that they were trading profitably, but it transpired that this was notional rather than financial profitability and that in terms of cash they were operating on the margins of bankruptcy. The first requirement therefore is for effective clearing and short term trade credit facilities.

31. What was striking, however, is that none of the significant firms in the industry had as yet been liquidated. All were operating - some at only marginally reduced levels to

1991. The reason it seems is that there is little potential advantage to creditors in foreclosing on their loans. All parties - suppliers, workers, and the taxation authorities - have an interest in keeping enterprises going, since for each there are few alternatives and little value in doing otherwise.

The loss of labour.

32. One of the most pressing results of the financial crisis has been a squeeze on wages. From our discussions with industrial and TV station managers, they gave priority to the payment of wages from their limited cash flow. But this was not always possible. In one plant visited basic wage payments (50% of normal; take home pay) had been due the previous day but there was no money to pay them. Other factories and TV centres said that they frequently had to postpone wage payments.

33. Particularly serious was the situation in the Research Institutes. They have been unable to raise salaries in line with inflation. As a result senior scientists were receiving a monthly salary of 6,000 roubles (\$12) as against industrial manual wage levels of 12,000-18,000 roubles which we observed in the factories in January.

34. Instead of laying off workers, the enterprises, in this industry at least, were distributing the available wage fund to the established workforce. The result is not a rise in unemployment but a sharp fall in real wages. There are advantages to this system. People still have a formal job and a workplace to go to. The problem is that for some the wage can no longer support their households.

35. Among scientists and technicians the response has been two fold:

a) there has been an increasing brain drain of senior scientists to the West.

b) groups of scientists have established their own small companies to sell research directly to clients. Of the four main institutes there were two where this had happened. The scientists worked with institute space and equipment after hours, with the knowledge of senior management, as a way of expanding their income. In some cases, the new private firms produced equipment for sale. In others they confined themselves to contract research. Those involved saw it as a direct alternative to emigration.

36. The danger to the Institutes is clear. On the one hand they have seen their central grants cut and are forced to rely on contracts with factories and TV centres. These tend to be linked to immediately commercial requirements at the expense of long term fundamental research. At the same time they are faced with the loss of key scientists and the spin off of the more commercial of their existing projects (many of the contracts negotiated by the spin off firms have been in consumer electronics). In these circumstances it is becoming ever harder to hold research teams together.

Fragmentation

37. With commercialisation and a collapsing macro economy, enterprises have been forced to consider their own survival first and foremost. Another side of the coin of managerial autonomy is sectoral fragmentation. We found little appreciation of the importance of sector strategy, nor awareness that competition and co-operation can be complements rather than alternatives. Indeed in Lithuania new anti trust laws prohibit inter industry co-operation.

Yet such co-operative competition has come to be recognised as a key feature of Japanese and German industry, as well as successful regions in Italy, Denmark and Spain.⁴ The one strong industrial association we met with was the informal grouping of chief engineers of TV stations from the CIS and Baltic states. They meet regularly to discuss common problems, though with the exception of the Russian national networks they are not in competition with each other.

38. The fragmentation has been compounded by the break up of the Soviet Union. A number of the new states are refusing to co-operate with Russia, and are reorienting themselves to the West European economy. This appears to be the case in the key state of the Ukraine, and was also true of Lithuania up to the shift in power after the last general election.

39. The significance of this type of fragmentation is all the greater because of the previous geographical division of labour which assigned many of the large TV production facilities to non Russian republics. Thus the Taurus plant at Siauliai in Lithuania was the sole producer of combined TV broadcasting systems (including outside broadcasting (OB) vans) and also had a monopoly of deflector yokes for cathode ray tubes.

40. Each state is now faced with the question of whether to try and continue within a CIS/Baltic industrial division of labour or, as seems likely, to attempt to assert itself in the wider international economy. On the basis of Western TVE experience, the latter course holds little long term promise. Newly independent states will be able to establish new plants. But it is difficult to see them being able to generate an adequate R&D programme to sustain themselves in world

4. An influential recent account of the reasons and forms of this co-operation is given in M. Best, *The New Competition*, Polity Press, 1990. See also G. Thompson, J. Frances, R. Levacic, and J. Mitchell (eds), *Market, Hierarchies and Networks*, Sage, 1991, which contains a number of papers on modern forms of networking.

competition unless they reach understandings with other parts of the FSU TV industry.

40. The current difficulties in the post Soviet TVE industry have served to weaken the industry at the very time when international competition promises to become more intense. Only with a strategy which addresses these competitive weaknesses can the CIS TVE hope to survive.

Strategic issues.

41. The key strategic issue is the following. The international television industry is on a threshold of a technological revolution. It will involve the digitalising of broadcast equipment and the introduction of high definition television, and thus require the replacement of TV and broadcast hardware, at an estimated cost of \$3-5 trillion over the next 10 - 30 years.

42. If the FSU is to play a significant role in the world market, it faces the dilemma of whether to upgrade its existing television technology to remain competitive in the current period, or whether to concentrate on skipping a stage and progressing straight to the new digital systems.

43. The cathode ray tube exemplifies the problem. Russia currently has 5 CRT plants, and nine factories producing glass for CRTs. It is recognised in the industry that Russian CRTs are only 80-90% of Western standard, because of a lack of black stripe technology and the quality of glass. One new glass factory has been established at Varonezh. To bring all glass production up to Western levels would require an investment of \$2 billion, and introducing black stripe technology would add further to this cost. Does such an investment programme make sense when the CRT will itself become obsolescent with the introduction of digital television?

44. Our view is that FSU industry should follow both paths:

- it should upgrade its existing production through the improvement of design, reliability, and the introduction of some key technologies. The introduction of colour television did not end the life of black and white, and we may expect existing analogue systems to continue for many years after digitalisation.

- it should also advance its digital technologies, not least because it has already made significant steps in the field through the military sector and because it still has a strong independent research base. However, for this technology to be translated into competitive world production, there needs to be a radical change in design, production management and marketing, which will be best developed through an immediate programme of upgrading.

This twin strategy should be advanced in both the consumer and the broadcast equipment sectors.

Key areas for development

1. Technology.

45. For domestic TV's, the key requirements are:

- greater reliability. The decisive advantage of Japanese televisions in the 1980's was that they were more reliable than European and American ones. Japanese companies investing in Britain improved reliability levels by 12 times, using the same or similar labour and plant, but with Japanese production engineering and organisational systems.

- black stripe technology, to be introduced over a five year period.

- diffusion of modern glass production, through investment (\$70-100 million) in a second modern glass plant capable of producing glass for HDTV.

- upgraded decoders

- sub micron technology for chips, and CCDs with much higher resolution for high definition television.

46. For broadcast television there are three key areas:

a) cameras.

The most immediate needs are:

- to replace traditional tube technology with sensors to make the camera smaller and more durable. For this CCD chips are needed, which the Russians have developed to a level adequate for a semi professional camera. For professional cameras chips could be imported from the West at a cost of only £30-100, but it would be a question of commercial politics whether or not they were supplied.

The optics, representing 25% of the camera cost, are good, though not yet up to Japanese standards. Their improvements depends more on production management than new technology.

b) VCRs.

There are three possibilities for broadcast VCR's:

- i) The Japanese have taken home format VHS and Super VHS and upgraded it to make broadcast machines. This would be suitable for regional and district stations. The Russians have made 180,000 VHS machines and could follow this path.

ii) Betacam. This is the most popular portable. The St Petersburg Institute has developed an all Russian version from scratch which produced acceptable quality pictures in the prototype we saw. It has so far manufactured ten of these.

iii) Studio video recorders. The main Russian production has been C format open reel machines, now 2 generations old, but developed entirely on their own. The plant in Novosibirsk has manufactured 800 of these, and they are still selling (Byelorussia has recently bought 4 for example). This machine could be modernised, particularly by replacing the open reels with cassettes, and is potentially exportable.

Strategically the industry could develop all three, though in practise, with the current shortage of resources, the choice lies between i) and ii) for the small portable market, which is the most pressing need.

iii) editing equipment.

47. The two main producers of editing suites are Lithuania and the Ukraine. Their product is significantly below Western levels, but the technology for improvement exists in the FSU, and could be quickly developed and translated into production.

2. Design and product engineering.

48. One of the noticeable features of the Russian and Lithuanian products is the poor quality of design. Whether the product is a studio camera, a compact OB van, or a TV set, design is markedly behind Western standards. Good FSU equipment often appeared inferior to Western models, not because it is operationally worse (in some cases we found it was better) but because of the design of its casings.

49. The issue is not merely a matter of designers, but rather the process of product design.⁵ One of the characteristics of

Japanese product development is the establishment of horizontal teams which include technologists, designers, production engineers, production managers and marketing specialists. The sharp separation of research and prototyping from mass production and sales that we observed in post Soviet production means that such co-ordination is notably lacking.

50. We suspect that the general lack of design awareness (which extends to the appearance of the factories and to wider issues of corporate design) is linked to the long standing tradition that it is substance not form which is the important industrial goal. The experience of world markets is that form is also critical, and the best traditions in design have sought to unite form and function.

3. Production management.

51. This is the area in which the Russian and Lithuanian plants we saw were farthest behind their main Western competitors. Defect and rework rates were high. (See Table 2). Quality control was in many cases separated from the operators. In the chip plant the standards of air circulation, of anti-contamination precautions, and machine protection were inferior to those of IBM and Hitachi by an order of magnitude and helped to account for the high defect rates. Protective frontages on the machines were in some cases missing or left open.

5. We were shown an instrument for night vision which had been developed for the military. In order to activate it, the operator had to press continuously and hard on a button which was difficult to do for longer than a minute. Such a feature could not have passed any ergonomic assessment, let alone testing by potential users.

TABLE 2

Defect Rates in FSU TV Production

On one chain of production visited the defect rates were as follows:

Cathode ray tubes:1st round of shadow masks	60%
Second round	4%
test on exit from CRT plant	2-3%
test on entry to TV factory	6%
TV sets	
final 100 hour factory test	10-15%
returns under guarantee	5-7%

Source: Factory interviews

52. We observed some production data being gathered by operatives, but for the most part there was a clear division between manual and technical staff, with the manual operations being narrow, repetitive and semi skilled. We were unable to gather data on stock turns, or capacity utilisation. Visually, all plants had equipment which was not working because of shortage of components, or lack of orders.

53. The engineers to whom we talked saw investment in new machinery as the key to raising levels of productivity and quality. Our initial assessment is that major improvements in both could be achieved with relatively little investment, through a transformation of production organisation towards the 'total quality' model.

4. Marketing.

54. Production and enterprise in this sector has unsurprisingly been dominated by engineers. Awareness of what is involved in orienting an industry towards the market is still only in its early stages. The lack of design is one instance. The lack of market research another. We were struck

by the weakness of the distinction made between potential and effective demand⁶. In the technical institutes central research was in some instances driven by the common priorities of the researchers rather than by commercial opportunities.

55. This traditional dominance of production and substance over the market and the requirements of users, has its strengths. It means there is a commitment to long term research. It favours a competition of substance rather than the manipulation of form. There is a sturdiness to the post Soviet audio equipment which is now coming back in to fashion in the West and provides the industry with export opportunities.

56. But to compete internationally there necessarily has to be a reorientation towards markets: the information they can provide about trends, and about the type, quality and design of products. In the West users are now seen as one of the most important sources of innovation. In the post Soviet industry there are channels for inter managerial co-operation, between producers and TV centres for example. But there was little evidence of feedback from the front line users of the equipment, nor of market research mechanisms in the consumer sector.

Institutional needs

57. The erosion of the old co-ordinating institutions has run ahead of the creation of new ones. In part this is because the experience of central planning has produced among enterprise managers (and economic policy makers) a reaction against any form of strategic co-ordination, and an Anglo-American reading of the nature of a market economy.

6. A number of enterprises, for example, said they were profitable, when profitability was purely notional, since they had not been paid for goods supplied, and were in fact on the verge of bankruptcy.

58. If the full force of the market were allowed to run its course in the TVE sector, we could expect the collapse of much of the industry, the continued haemorrhaging of research scientists, and the growing domination of the FSU internal markets by foreign technology and production.

59. Paradoxically the importance of the market reforms has been political, in weakening the power of central government. It has not been an adequate instrument of economic organisation since it is being introduced without a complementary institutional structure.

A way forward

60. We propose a five point action plan for implementation during 1993:

1. An industrial development bank.

61. Such a bank would be designed to be:

(a) a vehicle for clearing (and the organisation of barter) until more adequate national and international clearing systems are established,

(b) a channel for short, medium and long term credit for the development of the industry.

(c) a source of strategic co-ordination and industrial information for the industry.

62. The bank should be divided into two parts - a banking wing and a product/project/industrial development wing. Such a division has been effective in a number of developmental finance institutions. It presumes that successful banking operations depend on the quality of projects and the broader industrial base, and that a developmental section provides a critical source of guidance and information to the banking section on these issues.

63. In the case of post Soviet TVE, we recommend that the bank is established as a consortium of the leading industrial and research enterprises in the industry, with the involvement of an external funding source such as the EBRD. We found widespread support for such a proposal within the industry.

2. An industrial strategy for TVE.

64. What is needed is a more detailed audit of the industry, and the development of a common strategy, focussing initially on four sub sectors:

- consumer television and video
- broadcast cameras
- professional video tape recorders
- post production technology.

We propose that this work is carried out by a joint team, comprising Western specialists from the industry, and FSU counterparts.

3. Joint ventures.

65. The danger for the FSU economies at the moment is that foreign companies will take control of the key assets of the industry - so called cherry picking - in a way which weakens the long term future of industrial production. One of the purposes of the TVE strategy is to identify those areas where co-operation with overseas companies would strengthen FSU industry. The next generation of digital equipment is one example, where the costs of development are high, and where there exists opportunities for international co-operation in the development of new systems and standards.

4. Upgrading production.

66. One of the major weaknesses of the FSU TVE industry is the difficulty it has had in translating advanced technological prototypes into high quality volume production. There are a number of immediate ways in which this problem can be addressed:

a) through an exchange programme between Western and FSU enterprises, in which FSU managers and other production staff work side by side with Western counterparts from leading edge producers.

b) through co-operation agreements between two or three of the best international producers and plants in the FSU which would become 'pilot plants' of progressive production practise. A condition for factories taking on this role would that would be open for others to visit, and work in on an intra-FSU exchange programme.

c) through advanced management courses, tailored to the requirements of the TVE industry. These courses would be partly organised within the factories and partly in residential centres, and would be an occasion for the development of a shared orientation in the industry, and the development of common techniques (for example in forms of management information systems).

5. Industrial design.

67. Increasing an awareness of design is a long term process and is a problem that is not confined to the TVE industry. It requires a more general sponsorship of design schools, and of the design industry, as well as an integration of design into product engineering itself.

68. In the short term many of the TVE industry's products could be markedly improved by relatively modest outlays on re-styling (and re-naming) them, with the assistance of leading international design firms. There are a number of products that we saw which would have a market in the West if properly designed and presented. It would be one of the tasks of the next round of strategy missions to identify these products and potential design support, in order to increase the industry's

immediate access to foreign exchange other than through selling their critical assets.

Conclusions

69. Many of the industrial managers to whom we spoke saw their main problem as lack of investment funds. It was certainly true that some of the equipment in the factories we visited was in need of renewal, but the prime need at this point is in the field of software not hardware. The development of a strategic perspective, the maintenance of the high quality scientific and technical labour force, the upgrading of production and design, and the establishment of effective systems of interfirm banking and collaboration, all these are necessary in order that fixed capital investment should prove effective.

70. Software is of course a kind of capital and it needs finance. The 5 point plan we have outlined requires development funds which neither the FSU governments nor the enterprises are in a position to provide. These are funds that for the most part cannot be expected to earn market rates of return, which why in Western countries, many would be provided by, or part financed by the state.

71. Western experience also suggests that such programmes (and their accompanying funds) are often best channelled through specialist institutions - not Ministries of Industry - which are close to the industry, and in which those within the industry have a stake. This is why we have suggested that the development bank, with its strict separation of commercial and developmental functions, is the appropriate institution for the TVE industry at this time.

72. A similar principle should hold with donor agencies. They too should have a specialist development banking capacity which can actively partner and support its FSU counterpart. It must be capable to relating to detail not just large sums of money, and of establishing long term working relations of trust with its partners. Such a programme is thus as much a

challenge to the institutional capacity of Western agencies as it is to those in the East.

73. One of the over-riding institutional questions cannot yet be answered. We have throughout this report considered the TVE industry as encompassing the whole of the FSU. In some cases this is already unrealistic, with the new states like Ukraine, pursuing their own independent strategies. We also observed that Russian industry was already taking steps to free itself from dependence on non Russian sources of supply. In which case our proposals will have to be applied to each state simultaneously.

74. The new state which we considered most closely, Lithuania, has the possibilities of developing an integrated industry, which could compete on international markets. But this is a small country, with limited resources. It is difficult to see how it could be sustained as an autonomous industry in the long term without access to the range of technologies available within Russia.

75. For the new generation of digital broadcasting, Russia itself is probably too small. It too will have to co-operate. But one of our messages is that such co-operation need not curb independence but rather underpins it. For this reasons we propose that for the coming year at least, the five point plan be applied to all those countries in the FSU who express their interest in the programme. In this industry at least solo voyages are voyages to extinction.

Robin Murray
Roderick Snell
Victor Steinberg
David Youlton

5th April 1993

