
Systems and Networks

- **Integration of control and information systems and private networks and infrastructure for vertical markets including energy, environment, traffic, transport and telecommunications, with offerings based on an innovative combination of technology, infrastructure and content.**



- **Technology: providing solutions based on both in-house and third-party products.**
- **Infrastructure: providing spaces specifically designed and fitted out for the co-location and operation of computer and telecommunications equipment.**
- **Content: developing real-time control, management and information systems for target markets.**

Systems and Networks



The configuration of Abengoa's Systems and Networks business segment headed by Telvent was completed in January 2001 with the integration of Sainco and the companies it controls as a subsidiary of Telvent Sistemas y Redes.

With the creation of this new business segment, critical size, homogeneous technologies and a sound financial structure were achieved, key to being competitive in today's marketplace.

The tech slump in 2001 meant that many businesses in the technology and telecommunications sector were struggling. This affected some of Telvent's companies, as much of the capital expenditure and infrastructure deployment planned by these businesses was either postponed or cancelled altogether. However, the fact that we were able to rise to this difficult challenge, with Carrierhouse and Internet Datahouse reporting sales up 67% and 518% respectively on 2000, proves how effective and successful our business model and rigorous management approach are.

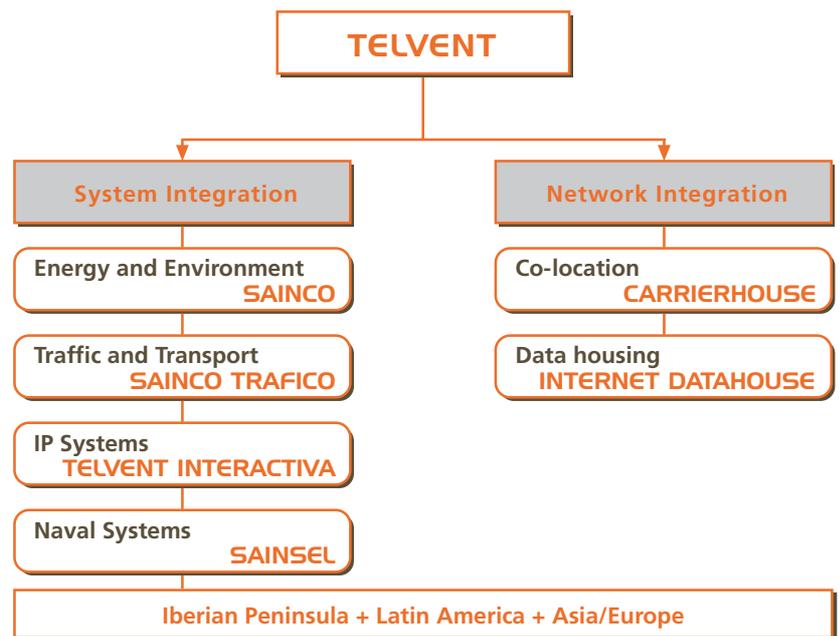
At Telvent, we are well aware of how important the efficient management of human resources is to achieving our objectives. Work therefore continued in 2001 to implement the Competency Management model following completion of the Selection and Training modules in Sainco and Abentel. In 2002 we will put the Performance Evaluation module into operation in these companies and implement it fully in all Telvent companies.

We are also aware of the importance of technological innovation. Major R&TD projects are implemented in all our business areas in cooperation with private and public entities both in Spain and Europe.

This strong commitment to the future resulted in us moving into new offices in Madrid equipped with the best, state-of-the-art facilities and located in a prime business environment, the Alcobendas Business Park.



Abentel became part of the Industrial Engineering and Construction business segment in December 2001, so that all activities relating to infrastructures are now grouped together in this segment.





System Integration

Energy and Environment

One of the objectives we have been pursuing for some time, that of balancing out our activity in Spain, Mexico and Brazil, was finally achieved in 2001, with each of these countries contributing 25% to total sales and representing the same percentage share of contracts in the forward order book for 2002.

Sainco's long-standing commitment to R&D&I was maintained in 2001, a key differentiating factor in our success and ability to outperform competitors.

We are currently leading an important European R&D project based on basic technologies such as microelectronic design and digital signal processing, to design a chip for broadband communications using the electricity network. The purpose of the project is to find economical solutions to the deployment of local area networks for private homes and small offices, using the electricity network to support them. The project is well advanced and all the technical challenges involved have been overcome.

As a result of ongoing innovation that keeps our product portfolio at the leading edge of industry developments, we added new supplementary equipment to it in 2001, including signal input/output cards, communication cards, etc. We received recognition of the quality of our R&D at the 2001 European Wind Energy Conference and Exhibition when our product known as Velflex, competing against 270 other entries, was awarded a prize for its outstanding contribution to the development of wind energy. Velflex is an advanced control system for the optimal orientation of wind turbines based on a digital signal processing system that supplies information about the wind turbine tower's degree of flexion. Sainco has patented this product.



In 2001 we initiated a self-assessment process based on the EFQM (European Foundation for Quality Management) **Business Excellence** model, using the tool known as *Perfil* developed by the CGC (Club de Gestión de la Calidad) which represents the EFQM in Spain.

Sainco's technological expertise and achievements in the rail sector earned it a contract for the power control system on the high-speed line that will link Madrid and Zaragoza in 2003 and which will eventually be extended to the border with France. This break into the high-speed train business marks a milestone, a before and after, in Sainco's activity in the rail sector.





Systems and Networks

In the **environmental sector**, the meteorological area achieved particularly good results. Spain has a mature meteorology sector, with the most sophisticated, state-of-the-art systems available worldwide. Sainco prides itself on having been a National Meteorology Institute supplier for over 25 years and during this time has played a part in ensuring that the surface observation systems and the air navigation aid systems installed in all Spain's airports (AENA) are to the highest technological standard and fully operative. Endesa, which, like other big companies, is committed to environmental protection, entrusted the supply, installation and commissioning of the air quality monitoring network for its Los Barrios thermal power station in Cadiz to Sainco.

Sainco is also committed to expanding its environmental activities to foreign markets, such as Nicaragua, Colombia, Guatemala and Mozambique. Its forward order book for 2002 suggests that it will build up and reinforce its market presence in certain countries and capitalise on new environmental business opportunities.

In the **electricity sector**, important contracts were secured in the area of integrated control and protection systems for major customers including El Paso Energy in Brazil (Macaé Plant), the Federal Electricity Commission in Mexico (Pidiriegas 410 and 403) and Unión Fenosa in Colombia (Electrocaribe in Cartagena de Indias). In the electricity dispatching sector, particularly important contracts included the remote control and communications system for the distribution network in the city of Cochabamba in Bolivia for Elfec and the design of the electricity management and exchange system for Cepsa for participation in the Spanish electricity pool OMEL.

The first phase of the Electricity Distribution Management System in the city of Rio de Janeiro for Light was completed on schedule and the entire project is expected to be concluded by mid 2002. The transmission network emergency control system for ONS, Brazil's national operator, was also completed in 2001 (the contract for the second phase of the project has also been secured),



as was the project for the distributed control system of the urban solid waste plant in Cerceda.

Another important achievement was the deployment of 30 integrated control and protection systems for Endesa's distribution substations. This brings the total for the last two years up to fifty, and a further forty systems are on order for delivery during the next two years. As a result of these contracts, together with the systems supplied to REE and Unión Fenosa, Sainco is now the leading company in this sector in Spain.

In the **oil and gas sector** we won two new very important customers, namely Repsol YPF in Argentina and Techint. We have been awarded several major projects abroad, such as the control and communications system for the Pto. Rosales-La Plata oil pipeline extension in Argentina for Repsol YPF and the control system for the Oleoducto de Crudos Pesados heavy crude oil pipeline in Ecuador contracted through Techint SACI. The end customer is the consortium OCP Limited, whose main shareholders are Repsol YPF and Alberta Energy. We continued to provide maintenance services for the SCADA systems of the Pemex Gas national gas pipeline network and for the



Systems and Networks



SCADA system of the Valle de México oil pipeline network for Pemex Refinación. The natural gas distribution network control system in Monterrey for Gas Natural, the digital monitoring and safety control system at the Dos Bocas crude oil storage terminal for Pemex E&P and the integral terminal operation control and monitoring systems (SIMCOT) in Cuernava, Cuautla and Toluca for Pemex Refinación were all completed on schedule.

In the **private networks** sector, progress was achieved in terms of activity and sales, and the year ended with good growth prospects for coming years. The strengthening of our position in this sector was based on an increase in business as integrators of private networks not only for control systems but also for other purposes such as voice transmission, video and corporate networks, etc. in target markets. As a result, the contracts secured in this area were worth more and were more impressive, a key factor in winning the confidence of customers.

The most significant project won this year was the Digital Trunked Radio System (TETRA) for the Federal Electricity Commission in Monterrey (Mexico).

Sainco Mexico won a particularly large volume of contracts in the electricity sector. Several years' work on control systems for substation automation has earned us the recognition of Mexico's Federal Electricity Commission, which is fully satisfied with the performance of the SICLE system for transmission substations and the SISCOPROM system for distribution substations. As a result, Sainco became the main supplier in Mexico of such systems, which were included in the integral construction package for the new transmission substations and lines forming part of the extensive network expansion plan that the Federal Electricity Commission is currently implementing and which will continue at the same pace into 2002.

In spite of the fact that activity to expand and modernise Pemex's infrastructure lost momentum in 2001 compared with other years, Sainco strengthened its position as one of the main control system integrators for the company, participating in significant projects involving complex safety



systems for the detection of gas and fire on various platforms and the Dos Bocas maritime terminal, one of the biggest of its kind in the world. We also implemented a busy programme of maintenance operations for the Pemex Gas SCADA and the Pemex Refinación Valle de México SCADA and completed and commissioned eight distribution terminal SIMCOTs.

We worked on the Computer-Aided Train Dispatching Project for Ferromex, which is due to be completed at the beginning of 2002. It is likely that the project will be extended to deploy a SIRAIL satellite rail traffic control system.

Systems and Networks



Traffic and Transport

Sainco Tráfico continued to expand according to the Strategic Plan. Growth was achieved both by opening up new markets and developing new products.

We penetrated two new markets: Central America and Southern Europe. In the Dominican Republic, specifically in the city of Santo Domingo, the first urban traffic control centre was put into operation, with 267 regulated intersections, although the system is designed to control over twice that number and is therefore capable of accommodating any future expansion of the city.

In Greece, we have already delivered half of the 32 automatic toll collection devices permitting toll payment by card for the Attiki Odos motorway near Athens.

Another important market in addition to these two new ones is Southeast Asia, particularly Malaysia, where we have been carrying out significant activities in Kuala Lumpur and Putrajaya over recent years.

Sainco Tráfico is therefore building up a strong international market presence through our subsidiaries. We have been operating in China for over ten years through our local company Sainco Electric Traffic, which has its head office in Peking, and we are continuously expanding in this market year after year. We have won contracts for various projects, such as the centralised urban traffic system in Zhengzhou and the Yantian-Bagang motorway traffic control and toll system. We have also completed several important projects including the Shenzhen 205 and 107 motorway toll management and control system, the Guangzhou 2nd Ring Road traffic control and toll system and the Shangdong motorway toll system.

Significant projects carried out in Brazil through our subsidiary Sainco Brasil include the centralised traffic light system in the city of Belo Horizonte, where we are setting up the centralised urban traffic control system known as Itaca, developed by Sainco Tráfico, which has already been deployed in Sao Paulo



(Brazil), Madrid and other cities with successful results. Also in Brazil, work continued on projects awarded in previous years, such as the metropolitan train ticket purchase and cancellation system in Belo Horizonte and the Intelligent Transportation System (ITS) for traffic control on the Anchieta-Imigrantes motorway.

Various projects have been carried out in Argentina through our subsidiary Sainco Argentina, including the RedEye traffic offence system integrated in the centralised traffic control system in Rosario, providing a solution to the serious problem of cars going through a red light for both pedestrians and drivers. We also continue to provide maintenance for the traffic systems in the cities of Buenos Aires, Rosario, Cordova and the inter-urban traffic control and toll system for the motorway to the west.



Systems and Networks



In the Spanish market, Sainco Tráfico has strengthened its position in the ticketing system sector. We have already completed numerous ticketing projects and have won further contracts, such as one to install a ticket purchase and cancellation system on line 8 of the Madrid Metro, line 2 of the Bilbao Metro and the enclosure of various local train stations for Renfe in Barcelona (tariff integration phase 2). New contracts were also won in the urban traffic sector, including one for a centralised traffic control system in Pontevedra, and in the interurban traffic sector, with a project for a traffic management system for N-IV and N-V and the control system for roads to the Central Pyrenees and Andalusia (Despeñaperros section).

In addition to these new contracts, we carried out many more projects in 2001 including the following:

- Northwest Traffic Management Centre and Dynamic Signalling in the area of influence with a control centre in La Coruña and subcentres in Santiago, Mos (Vigo), Orense and Lugo.
- Maintenance of roads to Madrid and ring roads in Barcelona, Seville, Zaragoza and Santiago de Compostela.
- Integral maintenance of the Eix Transversal roads in Barcelona and high-capacity roads in Vizcaya.
- Toll management and control system for the Navarre motorways (Audenasa).
- Toll management and control system for the Alicante-Cartagena motorway (Ausur).
- Ticket purchase and cancellation system for Renfe local trains in Barcelona (tariff integration phase 1).

Sainco Tráfico has invested human and financial resources in R&D&I in order to launch new products, tailored to meet the current and future needs of our customers. These products have resulted in the creation of new activities, such as work carried out for Renfe and the Bilbao Metro and work in progress for the Madrid Metro: MobiFast, ticket purchase and cancellation system for rail transport, which is being deployed for all rail sector customers in Spain.



SmartTOLL is an intelligent toll management and control system for motorways, tunnels and bridges. It can be easily adapted and scaled to accommodate any future changes that may be required in the operation of the system. It is based on the massive use of dynamic tolling as a means of toll collection.

City traffic is becoming heavier and heavier and traditional solutions are no longer enough to deal with the problem. Sainco Tráfico has therefore developed MoviSmart as an integral solution to improve traffic circulation. In conjunction with Itaca, an Adaptive, Expert System, MoviSmart radically optimises journey times within cities, which also contributes to improving the environment.

2001 was a very busy year and one in which we earned the gratitude of a number of customers for our help with preparing and adapting their ticketing systems for the arrival of the euro, further evidence of our commitment to providing the highest standard of customer service.

Systems and Networks



IP Systems

In spite of the effect that the bursting of the tech bubble and the aftermath of the 11th September attacks had on business in 2001, Telvent Interactiva (TI) continued to move forward, achieving sustained growth. TI strengthened its position as an information systems company focussed on asset management and targeting sectors where the Systems and Networks business segment has already built up a market presence.

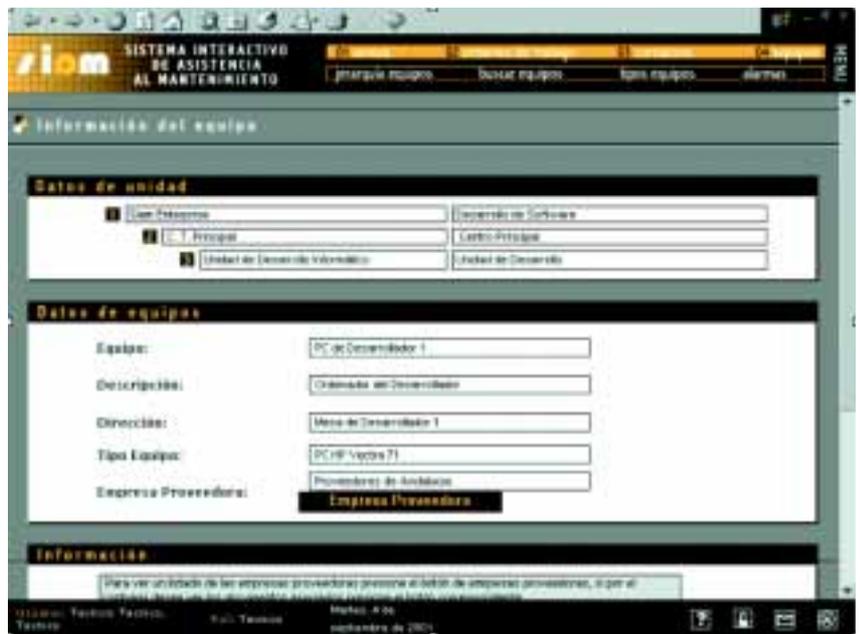
The public sector was the main source of growth, accounting for 80% of total sales in this area. Some of our most important customers in 2001 were the Cadiz Free Zone, RILCO and the Ministry of Science and Technology.

In the utilities sector we targeted energy and water companies, obtaining concrete results with customers such as Pemex, Remu and Giahsa.

TI has established the technological lines on which to base its solutions and we have signed strategic agreements with international partners. We have three TI competence centres: the Java Business Center, where work continued in cooperation with Sun; the Collaboration Excellence Center, which added new partners, namely Metastorm, Lexign and Hummingbird; and the Wireless Competence Center, where we opted to add a value-added company Viryanet to the existing partner Ericsson.

In 2001 we began building up our product portfolio, investing time and effort in R&D on a ongoing basis. Successful products include the following:

*RILCO (Latin American Logistics and Trade Network) promotes trade exchanges between the EU and Latin America using a Business to Business (B2B) portal and providing digital signature management. This product is attracting the attention of businesses involved in foreign trade.



* Intranet management: through the Illión and Pista cable projects, it provides collaboration services for businesses sharing an Intranet, for example, businesses located on the same industrial or technology park.

* WWFM: through the SIAM and Serbenet Projects, a Maintenance Technician Management platform has been defined, designed to cut maintenance costs in big organisations.

Systems and Networks



Naval Systems

We continued business in the area of simulation for civil applications with the delivery of a navigation and fishing simulator for the Alhucemas Professional Technical Maritime Fishing Institute of the Moroccan Ministry of Agriculture and Fisheries.

We also completed the third phase of the contract for a visual system to be integrated in the navigation simulator installed at the Royal Moroccan Navy Naval School.

In the Maritime Traffic Control line of business, the Sines Maritime Traffic Control Centre in Portugal was put into operation and we won the contracts for the maritime traffic control centres in Ceuta and Melilla.

In collaboration with Sainco Tráfico, we developed a road maintenance fleet monitoring system to extend our range of fleet monitoring products.

In the military sector, work continued on activities relating to the F-100 frigates. We developed and installed new FDDI (fibre optic) cards for the Spanish Defence Ministry to update the data interface of the tactical consoles, replacing hardware that has become obsolete. The Defence Ministry has also commissioned R&D for a WECDIS (warship electronic chart display) prototype navigation console, which will eventually be installed in the Spanish Navy's main naval units.



We now have more than 50,000 m2 of space available in Madrid, Barcelona and Lisbon and more than 50 clients, who occupy over 50% of the total area.

Proof of the fact that our clients are solid, solvent businesses and that we have implemented successful marketing and risk management strategies is that far from losing clients in 2001, a year marked by a slump in the technological and telecommunications sector, we saw the number of clients increase by 353%. Various major clients moved into our Madrid, Barcelona and Lisbon buildings in 2001, including NTT Verio and Telia.

Carrierhouse also signed an important contract in 2001 with the US company TyCom, which will house its TelExchanges in Carrierhouse's buildings in Madrid, Barcelona and Lisbon.

AENOR issued Carrierhouse with the Company Registration Certificate under the UNE-EN ISO 9002: 1994 standard in 2001.

Network Integration

Co-location

Carrierhouse has become the leading provider of co-location services in the Iberian Peninsula, operating buildings designed to house the operating, switching and transmission centres (network nodes) of telecommunication operators and Internet service providers (ISP), ensuring the highest standard of security, protection and interconnection.





Systems and Networks

Data Housing

2001 was the first full year of operation for Internet Datahouse (IDH) in the hosting market, during which it established its position among the leaders of the sector in Spain.

IDH is the first neutral, independent platform to offer an integral outsourcing solution, providing the most effective e-business support in the Iberian markets. This solution is designed specifically to provide a differential quality service for Internet businesses that require a latest-generation technological platform and professional services in Data Centres. Based on leading-edge technology, the project enables us to offer a personalised solution that is modifiable, scalable and adaptable to the specific needs of each client.

At IDH, we continued work on the IDEAL research project for Internet Data Centres in Spain and Latin America, funded by the Ministry of Science and Technology as part of the Profit Project. In 2001 we successfully passed the first audit carried out by the Ministry, having met the objectives fixed by the project.



Another important development was the signing of a technical and commercial collaboration agreement between IDH and NTT/VERIO, which also included Carrierhouse, in whose facilities (Madrid 2 Building) the Japanese multinational has installed its Spanish data centre.

