



HELPING YOUR BUSINESS GROW INTERNATIONALLY

Brazil's moment to shine

Opportunities for UK business
in the Rio 2016 Olympic
& Paralympic Games



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Executive summary

Once famously described as the perpetual ‘country of the future’ - Brazil is now very much the country of the present as well.

A democracy with a young, increasingly well educated population, vast mineral and agricultural resources, which is building on a decade of strong economic growth. The Brazil of today is now much more than the country of famous tropical beaches, gorgeous scenery and cool music. It now lends to, rather than borrows from, the IMF, exports jets and is pursuing a permanent seat on the UN Security Council.

So what went right? The inflation nightmare of the 80s is now a distant memory thanks to President Cardoso (1995-2003). This economic stability has brought rising living standards, reducing levels of violent crime, at least in the most prosperous regions, and wealth from the sale of commodities that are being exported to China (among others) as fast as they can be delivered to the nearest port. With growth only briefly affected by the 2009 crisis, the country is now forecast to continue growing at some 5% per annum for the foreseeable future.

With the FIFA World Cup in 2014 and the Olympic and Paralympic Games in 2016 Brazil will, for the first time, be part of the international global sporting events circuit, with Rio at its centre.

Rio is already Brazil’s energy capital, basking in an anticipated oil windfall of up to 90 billion barrels, and it is speeding up investment in infrastructure, social housing, urban regeneration and environmental remediation in order to appear at its best when the world tunes in on August 5th 2016 to the opening ceremony of the XXXI Olympiad.

The momentum for the 2016 Games is now building, with Brazil’s new president putting her weight behind the delivery structures. Rio is committed to delivering a sustainable Games with a strong focus on legacy. As a consequence, given the scale of shared goals, their interest in the London 2012 Games is high, putting British companies in a good position to contribute to delivering Rio’s ambitions.

Beyond the Olympics, the country’s pace of development is pushing the indigenous construction industry close to its capacity limit; airports, ports, roads, railways, dams, pipelines, oil rigs, housing and sanitation are all growing sectors, partly due to the PAC (the federally funded accelerated growth plan that focuses heavily on improving infrastructure) and partly as a result of the dynamic private sector.

As a consequence, there is now a lack of qualified professionals at all levels of the industry, from engineers to site managers to bricklayers. With the Olympics and the World Cup demand is soaring further, and few in the industry doubt that great changes to the industry lie ahead – only the industrialisation of building technology (be it at the office, with better software, or on site, with better construction methods and materials) can avoid gridlock. It is increasingly clear that for British companies to maximise their chances of successfully entering the Brazilian market they must look at collaboration or even joining forces with Brazilian companies. Because it is these companies that are best placed to negotiate Brazilian bureaucracy, navigate idiosyncratic business practices and offer access to a network of local contacts in what is an intense and ferociously competitive, market.

- The main contractors are extremely valuable points of entry, with excellent political relationships, legislation that favours them, and a dominant market position. They are involved in all types of projects, from telecoms to airports, operating concessions and developing PPPs.
- Looking to the future these Brazilian contractors want to join airport operators, to bid for future airport work when the country’s airports are privatised, they will need to work with port operators to bid for the construction and operation of the ports that are springing up around the country, as they are likely too to be teaming up with rail operators is part of a strategy to secure business from the expanding rail market. They require masterplanning expertise for the urban regeneration projects that are now becoming priorities for many Brazilian cities, after decades of neglect and they are keen to improve their sustainability credentials - aware of the impact and importance of the Olympics in pushing up the expectations and specifications of their services.
- In addition to these core, construction led, opportunities, some of these contractors see their businesses expanding into less traditional areas including, industrial waste disposal, general waste recycling; coastal management and land remediation. Other areas of developing opportunity and interest cover urban mobility projects, as they become priorities, as a consequence of dedicated federal funding for mobility projects coming on stream.



Executive summary (continued)

- Engineering firms have good working relationships with contractors, who may act both as partners and clients. Accustomed to partner with other companies, local or international, as a way of pooling resources, engineers appreciate the competitive advantages of joining up with foreign firms with complementary expertise. The most important and often cited requirement being: sustainability, with a view to delivering the Olympics; followed by masterplanning, urban mobility and intelligent cities skills, which are all moving up their list of priorities. With increasing sophistication in the market, specialist consultancy relating to accessibility, pedestrian modelling and BIM are beginning to become sought after capabilities.

Opportunities for British companies lie in the provision of high-end planning, design and engineering services, supply of construction materials, equipment and technology and in project management and sustainability.

Companies with specialist expertise, who dedicate time and effort to understanding the culture, finding the right partnerships and market niches in Brazil are very well placed to benefit from Brazil's extraordinary moment in the spotlight of sporting mega events. By building on those foundations British business can go beyond this to become a valuable strategic partner in building Brazil's future prosperity.

Table 1 Ten largest contractors in Brazil, from O Empreiteiro

Ranking 2010	Company	State	Gross revenue US\$ x 1,000	% revenue from public sector work	% revenue from private sector work
1	Norberto Odebrecht	RJ	2,649,378	62	38
2	Camargo Corrêa	SP	2,635,628	35	65
3	Andrade Gutierrez	MG	2,094,011	72	28
4	Queiroz Galvão	RJ	2,020,292	100	-
5	OAS	SP	1,307,759	59	41
6	Galvão Engenharia	SP	1,065,653	51	49
7	Delta Construções	RJ	1,056,000	-	-
8	Mendes Júnior Trading	MG	690,703	80	20
9	Gafisa	SP	614,718	-	-
10	Carioca Christiani-Nielsen	RJ	601,585	50	50

Table 2 Ten largest engineering companies in Brazil, from O Empreiteiro

Ranking 2010	Company	State	Gross revenue US\$ x 1,000	Employees	
1	Engevix Engenharia	SP	734,543	2,630	-
2	Promon Engenharia	SP	304,232	844	-
3	Concremat Engenharia	RJ	266,561	2,976	-
4	Cnec Engenharia	SP	186,872	590	-
5	Technip Brasil	RJ	135,620	1,054	-
6	Logos Engenharia	SP	125,252	870	-
7	Tecnosolo	RJ	90,638	1,049	-
8	Minerconsult Engenharia	MG	89,599	926	-
9	Progen - Projetos e Gerenciamento	SP	88,685	1,600	-
10	Leme Engenharia	MG	87,400	821	-

The exchange rate used for all calculations in this report is 1.6758 Brazilian Real to the US dollar.

1 Introduction



1 Introduction

1.1 The Short Term Business Attachment scheme

The Short Term Business Attachment (STBA) scheme aims to strengthen the Government's partnership with business and support development of business opportunities for UK companies overseas.

Within the scheme senior managers and people with specialist skills from the private sector are seconded to UK Trade & Investment's (UKTI) commercial sections in Embassies, High Commissions and Consulates overseas to work on specific projects. These areas of work reflect the corporate strategy and objectives of UKTI.

The focus of projects is flexible to meet the needs of different Posts. Secondees are engaged in researching and developing opportunities in specific sectors and raising the profile of UK capability. Secondments vary between 3 and 6 months.

1.2 The author

UK Trade & Investment seconded John de Campos Cruz from Buro Happold on a Short Term Business Attachment (STBA) to identify opportunities for the British construction sector in sports and infrastructure for the 2016 Games in Rio de Janeiro.

John is an architect and urban planner, and has worked as a transportation planner at Buro Happold for the past 5 years. Prior to that he worked as an architect in the UK, Germany and Portugal. He is a native Portuguese speaker and a regular visitor to Brazil.

The author would like to thank the staff of UK Trade & Investment in Rio de Janeiro and São Paulo for their assistance in undertaking this assignment.

1.3 Objectives of the report

The aim of the assignment was to research opportunities in sports and infrastructure for the UK construction industry arising in Rio de Janeiro, directly or indirectly, from the city's hosting of the 2016 Olympic Games.

The opportunities identified in this report are relevant for all areas of the construction industry, including architecture, engineering, product supply and construction.

The programme consisted of a 4-month research period in collaboration with the sports infrastructure team in Rio, and aimed to:

- understand the structures within the planning and implementation authorities in the Olympic machine in Rio
- articulate the emerging procurement procedures to be employed by the Rio authorities
- highlight the role the leading Brazilian contractors will play in responding to tenders
- identify particular projects that are a good fit to UK capability

1.4 Scope of the report

Due to the limited duration of the STBA and the evolving nature of the planning for the 2016 Games, this report should be read as an introduction to the opportunities that will arise in Rio.

More detailed information about the projects it highlights and the processes it details may be obtained by commissioning tailored research (specific to your company's interests) from the UK Trade & Investment offices in Brazil.

Where opportunities arise that are directly relevant to UK companies, these will also be published as business opportunities on the UKTI portal. UK companies can arrange to receive these business opportunity alerts (free of charge) by registering on the UKTI portal www.ukti.gov.uk



2 Context



2 Context

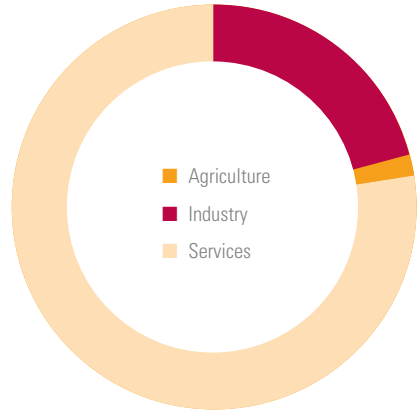
2.1. Brazil

Rio de Janeiro's selection over Chicago, Tokyo and Madrid as host of the 2016 Olympic and Paralympic Games crowned a second decade of growth, stability and rising prosperity in Brazil.

The announcement had been preceded by the confirmation that the country would host the 2014 FIFA World Cup. To organise both events within the same decade, is a challenge that will mobilise Brazilian talent and confirm the country's new international standing.

Testifying to Brazil's strong economic performance over the last two decades, its economy dipped by only about 0.6% in 2009, and rebounded in 2010, with average growth of 7.5%¹. The economy is not only healthy, but also big. Its GDP of US\$ 1.796 trillion in 2009 puts it in the top ten economies of the world². As a reflection of the health of the economy, the unemployment rate in 2010, stood at 6.7%, which was 1.4% lower than the year before³.

The percentage contribution of the major sectors to Brazilian GDP is shown in Graph 1.



Graph 1 Contribution of each sector to Brazilian GDP, 2009

Table 3 Percentage GDP contribution by sector and industry, 2009 (MDIC)^a

Area	Industry	%	Group %
Agriculture	Agriculture	6.1	6.1
Industry	Mining	1.3	25.4
	Transformative	15.5	
	Construction	5.1	
	Utilities	3.5	
Services	Trade	11.9	68.5
	Transport, warehousing and mail	5.1	
	IT	3.6	
	Finance	7.3	
	Real Estate	8.4	
	Administrative, health and education	16.7	
	Other	15.5	

The contribution of the construction industry to the country's GDP is shown below, as 5.1%. Given the outlook for the industry over the next few years, this figure is set to grow by an estimated 1%.

After breaking the cycle of hyperinflation in the 90s, stability has brought with it gradual improvement in living standards, supported by low inflation, consistent economic growth, cash-transfer programmes and increases to the minimum wage. Raising living standards have swelled the middle classes, creating a surge in the demand for consumer goods and services, but this has not been matched by an equivalent and necessary investment in infrastructure.

During the second Lula administration the issue of infrastructure was addressed by the creation of the Accelerated Growth Programme (PAC, in Portuguese), an initiative designed to jump-start the construction of infrastructure, funded by the national development bank (BNDES).

The owner of the programme under Lula was his Cabinet Office, headed by Dilma Rousseff. Rousseff (known commonly as Dilma) was elected president herself in 2010 and is now Brazil's first female president. She pledged to continue the PAC's role as the country's main infrastructure delivery instrument. This presents challenges of its own, in a country as vast as Brazil, where growth rates are high, the quality of government services tends to be poor, and severe regional disparities exist.

The construction sector in Brazil is experiencing a boom. This is creating soaring demand for construction materials, credit and equipment, as well as for construction workers and qualified professionals. Engineers and project and site managers are becoming more expensive and scarce to the point that some experts refer to the impending "blackout of engineers"⁵. The solutions for such bottlenecks are to be found either in the import of labour from neighbouring countries, or in the introduction of better, more efficient construction methods and engineering. UK companies can assist in overcoming this capacity crunch either directly, through sub-contracting, or indirectly, through technological and technical inputs.



2 Context (continued)

2.2 Infrastructure

Discussions about infrastructure in Brazil tend to focus on the three main points of sanitation, power and transport. With only 44% of homes connected to a sewage network in 2008, Brazil has a long way to go to achieve universal sanitation⁶. Access to water is much higher, with almost 80% of all homes connected to a public network. This, however, hides huge regional disparities - only 44% of homes in the North have piped water. Sanitation is becoming big business as municipalities contract out the construction and operation of networks to private operators. Specialist building/operating companies are slowly emerging, in order to meet the demand generated in the sector, requiring technology, expertise and manpower. The success of concessions and PPPs in the water and sanitation market is beginning to be noticed by the waste disposal industry, and here the market is quickly accelerating too, increasing demand for incinerators, waste to energy plants and operators.

Brazil can only grow as much as its power structure will allow, and frequent brownouts and blackouts are reminders of the need to invest further. The country has enormous resources in hydroelectric power, and large projects in the sector continue to emerge. Some of this investment is not uncontroversial, given the environmental impact of large dams on communities and natural habitats, but the trend is clear - renewables will continue to have much to contribute to Brazil's energy security, and interest is rising too in wind and solar power generation. Plans to increase the country's nuclear power generation capability are already in place, with the third reactor at Angra dos Reis, in the state of Rio, now in the pipeline. In the oil and gas sector, good news is building on yet more good news. Brazil now extracts around 2m barrels/day and has certified reserves of 14bn barrels. A further 70 to 90 billion barrels is expected to be added to this total once exploration begins in the pre-salt layers off the coast of Rio.

Finally, for a country that is a big commodity exporter (57.5% of all exports are commodities compared to 42.5% of manufactured goods) being able to move freight efficiently is crucial. However, Brazil does not have well integrated transportation networks, and investment in roads overshadows investment in any other mode of transport, whether it be rail, waterways or air. With events like the FIFA World Cup 2014 and the 2016 Olympics on the horizon, tackling the lack of airport capacity is becoming an urgent issue of national importance but other transport issues are in many ways equally challenging. Brazil's transport infrastructure assets are as follows:

Table 4 Brazil's Transport Infrastructure, in Revista Exame

Airports		
International	33	
Domestic	35	
Airfields	2,783	
Helicopter landings	1,040	
Total	3,891	
Airport traffic		
Passengers	128,135,616	
Aircraft	2,290,950	
Freight	1,114,754	metric tons
Post	181,511	metric tons
Railways		
Private	28,840	km
Public	866	km
Total	29,706	km
Freight	532,700,000	metric tons
Passengers	1,730,000	
Waterways		
Navigable waterways	42,828	km
Used	27,420	km
Freight	25,293,021	metric tons
Ports		
Open ports	37	
Private terminals	84	
Total	121	
Solid freight	433.0	million metric tons
Liquid freight	197.9	million metric tons
General	102.0	million metric tons
Total	732.9	million metric tons
Roads		
Non-paved	1,499,519	km
Paved	212,618	km
Total	1,712,137	km

The aviation sector is experiencing unprecedented growth, with a forecast annual growth rate of 7% for the next decade. Internal passenger demand is forecast to triple by 2030, placing growing pressure on existing infrastructure, which is already coping badly with current demand. With 13 of Brazil's 20 major airports working at or above capacity, demand peaks like the FIFA World Cup or the Olympic Games will require exceptional planning to avoid collapse. Although US\$ 3bn has been earmarked for airport expansion and improvement work for the 12 World Cup host cities, precious little time remains to launch the public tender process, plan, approve, and carry out the work.

The new Ministry of Planning has announced the creation of a State Secretariat for Airports, which will absorb ANAC, the airport regulator, and Infraero, the national airport operator, with a view to rationalising operations and planning for the increasing demand of the coming decades, as well as coping with the peaks expected in 2014 and 2016. In recognition of the difficulties encountered by the public sector in delivering this work, the current government also plans to privatise the operation of some airports, and bring private expertise to the sector in the form of concessions.

Infraero has meanwhile announced plans to create temporary terminals and passenger facilities using a modular construction system developed in-house, anticipating delays in the permanent works and privatisation process.

Rail freight makes up around 25% of the total freight transport in Brazil. This compares with 40% worldwide, which gives the sector ample room to grow. The vast majority of lines are in private hands, and the significant growth in rolling stock observed since 2000 is accounted for by private investment. The rail sector suffers from under-investment but also from what is seen by investors as an over-bureaucratic project approval procedure. It is 80% narrow gauge and lacks grade-separated junctions, the network does not, therefore, allow for high speeds and operates inefficiently.

The creation of a new high-speed rail link between Rio de Janeiro and São Paulo via Campinas, at an estimated cost of R\$ 33bn, would be an important step in the creation of a viable long-distance passenger rail network. The project should also bring know-how in an underdeveloped area of expertise and represent an interesting reference project for the construction of high-speed rail systems in terrain with difficult topography. The plans are controversial, though, not least because they highlight the lack of public investment elsewhere in the network. Scheduled to be announced in November 2010, the winning consortium is not now expected to be known until the summer of 2011 at the earliest.

Only 7% of all Brazilian freight is carried by water-based transport. It grapples with under-investment, few interchange facilities, few locks, low bridges and the same high tax burden all other modes of transport face. With little money earmarked for the improvement of waterways, it remains the most under-utilised. It continues to be important, primarily, in the north of the country, where other modes are less competitive.

Clearly going through a phase of expansion, Brazilian ports have seen a 50% increase in freight volumes since 2000. Approximately two thirds of all Brazilian ports are private. The sector has been under scrutiny by the government, with a National Plan for Port Logistics currently in its initial stages, surveying the assets. The Special Secretariat for Ports is now managed by professionals, not political appointees, following a 2007 reshuffle.

Growth in the port sector is reflected in the large number of applications for port projects across the country. With the commodity boom Brazil is experiencing, investment in ports needs to go hand in hand with better integration with transport networks, be they road, rail or pipeline. Brazil's biggest contractors are well aware of the business potential represented by the port sector, which goes beyond construction work to include the operation of facilities. An opportunity exists here for British port operators and specialists in port logistics to join Brazilian investors in exploiting that potential.

Roads form the core of Brazil's transport infrastructure, carrying almost 60% of all freight traffic in the country. The quality of Brazilian roads has improved markedly in the recent past. This is due both to investment in roads and to improved capacity, on the part of state and municipal authorities, to disperse funds effectively and efficiently. Between 2007 and 2010 approximately US\$ 16bn was invested in the sector, with a consequent improvement in quality. However, it is estimated that the poor quality of Brazilian roads still adds some 28% to transport costs, which can seriously undermine the competitiveness of exporters.

The private sector delivers the best roads in Brazil. 7% of the country's roads are presently under concession to private operators. More than 50 such operators exist today, up from only six in 1996. Toll roads have become part of Brazilian culture, and encounter no public opposition. Although the majority of privately-operated roads are found in the State of São Paulo, examples of such ventures now exist throughout the country, including Linha Amarela in Rio de Janeiro city, the first urban toll road in the country.

2 Context (continued)

2.3 The PAC

The first Accelerated Growth Plan (PAC in Portuguese) was launched in 2007 by the Lula Government. Dilma Rousseff, then head of President Lula's Cabinet Office, was the coordinator of the programme, and after being elected to become President herself, vowed to continue it.

The first PAC, known as PAC 1, ended in 2010. It had an earmarked budget of over US\$ 390bn, US\$ 300bn of which was used between 2007 and 2010 - the discrepancy is accounted for by the long term nature of investment in infrastructure, which required that some work be undertaken post 2010. The PAC had a tripartite mandate as follows:

- Logistics - roads, railways, ports, airports and waterways (US\$ 34bn spent)
- Energy - generation and distribution of electricity; production, concession and distribution of oil, natural gas and renewable energy (US\$ 164bn spent)
- Social and Urban infrastructure - sewage, social housing, subways, heavy rail, power grid and water resources (US\$ 102bn spent)

The aim of the programme was to go beyond simply expanding investment in the country, to instead, use infrastructure as a vehicle to promote social and economic improvement throughout Brazil.

The PAC placed strong emphasis on the energy sector because of its strategic role for the country's economic growth. Brazilian officials are well aware that, in spite of impressive growth in the production of biofuels and crude oil self-sufficiency, the country still depends on foreign petroleum products and is vulnerable to electricity shortfalls. Although not at the scale of the 1999 blackout, when over 75 million people were left in the dark, the blackout in the Northeast in early February 2011 disrupted the lives of 50 million Brazilians. Another one in the city of São Paulo a few days later was felt by about 2.5 million people.⁷

In addition to the direct financing of infrastructure work, a number of measures to enhance the investment climate were ushered in by the programme, such as improving the regulatory framework to cut red tape and speed up investment. This includes tax exemptions, mainly for investments in infrastructure, but also in semiconductors, digital media, micro computing and steel⁸.

A tax reform package was also implemented during PAC1, extending the deadlines for national insurance contributions and implementing electronic invoicing. Other measures designed to improve the business environment included the reduction of basic spreads in the lines of credit for strategic segments, such as electrical energy, logistics and urban development. Internal working groups were also created to monitor, observe and respond to external control bodies in respect of PAC projects funded by the Brazilian National Bank for Development (BNDES).



BNDES plays a key role in the funding of PAC work, particularly in the area of energy, which is by far the largest beneficiary of the programme. The bank created two main PAC programmes to serve as dedicated vehicles for infrastructure:

- BNDES Credit Programme for the Growth Acceleration Programme, to support projects under PAC within the lines of infrastructure, operations with states and municipalities, and of low-tariff type auctions
- BNDES ProPAC, a programme intended to finance the additional burden incurred by Brazilian States to undertake PAC-financed projects

In March 2010 a second PAC, named PAC 2, was launched. The programme forecasts investments of US\$945bn, with a total expenditure of US\$569bn during the period 2011-2014 alone. PAC 2 is organised along the same three main streams of work, logistics, energy, and social and urban infrastructure.⁹ Priority will be given to projects that:

- Leverage local and regional development, and reduce social and regional inequalities
- Are a core part of strategic sector plans
- Create a synergy with and complement PAC 1 projects
- Promote environmental sustainability
- Renovate existing infrastructure

The investment matrix proposed by the federal government for PAC 2 is as follows:

However, estimates of the value actually delivered by the first PAC vary. Some problems have been identified with the capacity of the lower tiers of government to spend their PAC funds. Amapá and Rio de Janeiro are two states where only a fraction of the available funds from PAC 1 were successfully spent by the beneficiaries. This was attributed to a number of factors that included a lack of expertise in managing public funds and undertaking public works. Suspicions of corruption have also led the national auditor to order a freeze on some projects¹¹. With investment ramping up in the next few years, the frequency of such cases is likely to increase.

Table 5 PAC 2 investment matrix¹⁰

Subprogramme	Mandate	2011 - 2014	Post 2014	Total
PAC Cidade Melhor	Better urban environment	34.1	-	34.1
PAC Comunidade Cidadã	Community improvements	13.7	-	13.7
PAC MCMV	Social Housing	166.0	-	166.0
PAC Água e Luz para Todos	Water and power distribution	18.3	-	18.3
PAC Transportes	Transport	62.4	2.7	65.0
PAC Energia	Energy generation and distribution	275.5	374.1	649.5
Total US\$ bn		569.9	376.8	946.7



2.4 Rio de Janeiro

On the 2nd of October 2009 the city of Rio de Janeiro was chosen to host the 2016 Olympic and Paralympic Games. The first South American city to host the Games, Rio had prepared a bid with a strong focus on legacy in sports, infrastructure and urban regeneration.

Winning the Games was an achievement that was hailed internationally as the coming of age for the city, which had suffered chronic under-investment in infrastructure and housing for decades. A city that is today as famous for the slums that encircle its hills and the appalling (but improving) crime statistics, as for its beaches and dramatic scenery.

A failed social housing policy, combined with the absence of planning and a rural exodus to the city (that began in the 70s) has led to largely uncontrolled urban growth, resulting in Rio's current population of 6 million. A large proportion of these residents are now living in self-made (favela, or slum) accommodation.

Rio is Brazil's second city by population (after São Paulo, which is the largest city in South America). Rio's economy performs above the Brazilian average, with a GDP per capita of US\$12,630 compared to US\$10,298 nationally¹² (2010). It also has a lower rate of unemployment, at 5.6% (the national average was 7.5% in May 2010).

The city is the energy capital of the country, home to Petrobras, the mixed-capital oil & gas behemoth, and Brazil's largest company. Vale, Brazil's own (now-private) mining giant, is also based in Rio, as is BNDES, the Brazilian National Bank for Development, which kept the majority of its operations in the city in spite of the transfer of the capital to Brasilia in 1960.

Upon its nomination, as host city of the 2016 Games, Rio de Janeiro set up an investment company with a similar remit to that of London and Partners, London's foreign direct investment agency. Rio Negócios promotes the city of Rio to foreign investors, it helps companies with the bureaucracy involved in setting up their business, and provides market research and local partner contacts. It has a close working relationship with UKTI, in recognition of the importance of British expertise in the areas of infrastructure, energy (including oil & gas) and sports.

According to Rio Negocios, the future of Rio lies within five axes of development. These are:

- Energy. In the area of oil and gas, and all its derivative industries and sectors, including R&D
- Infrastructure. The city is undergoing profound change as a result of winning the 2016 Games and the FIFA World Cup 2014
- IT. The highest concentration of IT technology specialists within Brazil is found in Rio
- Creative industries and media. Home to Brazil's largest broadcaster, the city is the country's media heartland
- Manufacturing. Rio is the country's main steel production centre



2 Context (continued)

In addition to the sectors above, with world renowned yearly events like Carnival and New Year, tropical beaches and great culture, Rio is also Brazil's top tourist attraction.

Crowning Rio's achievements over the past decade, winning the 2016 Games came at a moment of rare political alignment. The Games have strong support at all three levels of government - municipal, state and federal - in spite of the different party affiliations. In preparation for the event, the state and municipal governments have brought forward a number of projects and programmes - many PAC funded. This adds further urgency to the delivery of significant infrastructure. The city is, therefore, experiencing a construction boom unlike anything since it lost the role of national capital.

The FIFA World Cup and the Olympic Games are, however, not the only international events that will take place in Rio. The following events are also located in Rio in the run up to and including the 2016 Olympic Games:

- 2011: Military Games. July 16-24, 2011, 7,000 participants
- 2012: Rio+20. The United Nations Conference on Sustainable Development (Rio+20), two decades on from Rio92
- 2013: Confederations Cup. The FIFA-organised inter-world cup tournament
- 2014: FIFA World Cup
- 2016: Olympic and Paralympic Games

The legacy that the two main events will leave will transform the city, by the sheer scale of the planned investment in public security, environment and infrastructure. A far-reaching transportation plan aimed at providing a well-integrated network throughout the metropolis will include a new metro line and a BRT network similar in scope to that of Bogota, with a hitherto missing direct link to the international airport, itself the object of a significant refurbishment that will raise its passenger capacity from the current 15m passengers/year to 20m passengers/year by 2014.

The brand of Rio is also expected to be given a boost, and Rio's government is confident that the city's position as the leading tourist destination in the country and within Latin America - 38% of all visitors to the country pass through - will be reinforced by the attention the city will attract as a result of events like the Olympic Games.

What will need to happen preferably before 2014 and certainly before 2016, is a serious overhaul of the hotel sector, currently lagging behind in terms of quality and quantity. Of the 50,000 rooms needed for the Olympic Games, only about half exist at present. Plans are, though, in place to bridge the gap in the very near future. Adding to the difficulty of delivering such a large number of rooms, to such tight deadlines, in what is already a very dense urban environment, is the challenge of finding and training sufficient staff to run existing and future hotels.

Even if not everything were to be achieved on time, or to the high specification that FIFA and the International Olympic Committee require, Rio would emerge, post 2016, as a very different city from today. The aim of this document is to understand the contribution British firms should be well placed to make in shaping that new Rio.



3 The Rio 2016 Olympic and Paralympic Games



3 The Rio 2016 Olympic and Paralympic Games

The Rio Olympic and Paralympic Games will be the first to take place in South America. Winning the right to host the event mobilised all levels of Brazilian government, and the personal endorsement of the then president Lula, who lobbied for a Brazilian victory, was a clear sign of the commitment of the country to host a memorable event.

The Rio bid was strong on legacy commitments, with a view to using the Olympics as a catalyst for social and urban renewal of the city of Rio de Janeiro, while leaving a lasting sports legacy for Brazil as a whole, and boosting the country's credentials as a tourist destination.

While some of the legacy projects will be new, others were already in the pipeline as part of the overall planning for the city and state of Rio. Projects that are of importance to the city and are relevant for the hosting of the Games, have seen their schedule accelerated, where feasible, to also serve the FIFA World Cup in 2014. The Games legacy will broadly include:

- Public transport improvements (trains, metro and BRT)
- The regeneration of the port of Rio, with the aim of transforming it into an entertainment and tourist district with a residential component. The port will be Rio's largest-scale urban project in decades, and will have new facilities to moor cruise ships; a hotel, a conference centre, back office areas and the Olympic non-accredited Media and Referee Villages, which will be converted to housing after the Games

- The awarding authority wants to achieve the highest standards of environmental quality and create a benchmark in sustainability, accessibility, urban and social integration and design, as part of the wider Olympic legacy for the city. So sanitation, sewage treatment, tree-planting and environmental education programmes all form part of the portfolio of Olympic projects
- New housing, retail and leisure facilities in Deodoro and Barra da Tijuca, as well as in the port area
- And of course new sports facilities, mainly in the Barra and Deodoro regions, including an Olympic Park

The Games will be held in four areas of the city. They are:

- 1 Barra da Tijuca** - the area commonly referred to as Barra is a suburb to the west of Rio, an area of strong urban growth and the natural expansion area for the city. The core of the Olympic facilities will be based here. The Olympic Park will contain the main sports venues in this area, the Olympic Training Centre, the Maria Lenk Aquatic Centre, the Arena, the Aquatics Stadium, the Velodrome, the Tennis Centre, the Hockey Centre, the International Broadcasting Centre and the Main Press Centre. Another venue in the area is Riocentro, an existing facility that will be converted temporarily for the Games. The Olympic/Paralympic and Media Villages are also in Barra. The project for Barra includes improved transport links, sanitation, and environmental remediation and protection work.

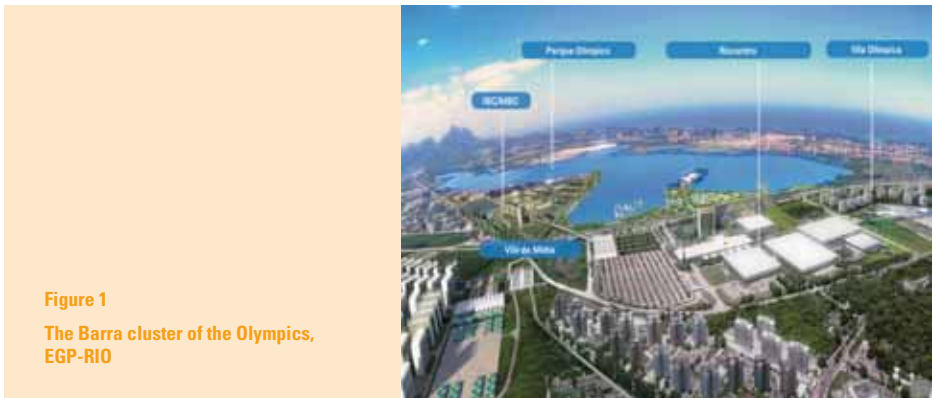


Figure 1
The Barra cluster of the Olympics,
EGP-RIO

- 2 Deodoro** - a suburb in northern Rio, Deodoro will be home to the 'X Park', a sports complex that will combine Olympic disciplines with the modern sports that are expected to attract the area's large contingent of disadvantaged youths. The Deodoro Village will also provide new accommodation in the area.
- 3 Maracanã** - another northern suburb, the Maracanã cluster is where the famous Maracanã stadium is situated. The stadium will host the opening and closing ceremonies, and is being refurbished for the 2014 FIFA World Cup. The Sambódromo, where Rio's Carnival is held every year, will also be refurbished. Originally part of the Maracanã zone project, the regeneration of the Port of Rio has now grown to become a project in its own right, and is dealt with separately in section 3.4.
- 4 Copacabana** - arguably Rio's most famous neighbourhood, Copacabana will receive a temporary stadium on its beach. The existing fort of Copacabana will also be temporarily converted to host Olympic events.

The 2016 Paralympic Games will take place following the Olympic Games. The Paralympics will be held in the same venues as their Olympic equivalent. While all venues built for the 2007 Pan American Games were designed using best practice international standards for accessibility and sustainability, older venues require refurbishment. Transport infrastructure is currently partially accessible but according to Brazilian Law, all facilities and transport systems will need to be made fully accessible by 2014. New hotels throughout the city will have 5% accessible accommodation. Rio 2016 have committed to contracting advisers who have previously worked on Paralympic Games to work with them on developing the solutions for 2016 and they are keen to use the most up-to-date international standards and expertise.

For all the planned permanent and temporary venues of the Olympic and Paralympic Games a comprehensive briefing process has been undertaken to ensure standards will be met. Accessible seating has been planned in line with the International Olympic Committee's (IOC's) Technical Manual on Design Standards for Competition Venues and the Brazilian Association of Technical Norms (ABNT in Portuguese).

Rio 2016 and relevant stakeholders have agreed on the following actions to support accessibility for the Games:

- Adoption by Rio of the Brazilian accessibility legislation
- Establishing a panel of national accessibility experts to work with Rio 2016's Accessibility Manager and the appointment of independent international experts to review all venues, infrastructure projects, cultural facilities and the general city environment
- Providing integrated, accessible seating for each client according to the International Paralympic Committee's (IPC's) requirements
- Installing accessible toilets at a ratio of one for every 15 spectators requiring accessible seating
- Using excess press and broadcast camera platforms from the Olympic Games as accessible seating platforms for the Paralympic Games
- Applying the IPC's accessibility guidelines
- Minimising transition works between the two Games



3 The Rio 2016 Olympic and Paralympic Games (cont'd)

The United Nations Convention on the Rights of Persons with Disabilities and its Optional Protocol, signed by the Brazilian Government in 2008, will further inform the design and construction of all Games venues. Australian consultant Nick Morris was appointed by the Brazilian Olympic Committee (BOC) to provide advice on the accessibility of sports facilities, hotels and tourist attractions. His recommendations included improving pavement maintenance, junction signalling, and tackling accessibility to the city's buses. The task of turning Rio into an accessible city poses an enormous challenge that will not be met easily by Brazilian consultants alone, given a generally poor understanding of accessibility issues within the construction industry. This applies to both the wider strategic issues of accessibility within the city and to the adaptation of existing services and venues, as well as the design of new venues. There is therefore, a significant opportunity for British accessibility consultants to contribute to this work.

Rio 2016 will provide incentives to develop accessibility training programmes for those working in hospitality and tourism. The city of Rio will create a certificate of approval for companies and professionals who participate in specific courses, as well as those that retrofit their facilities according to international accessibility standards.

Finally, with regards to sport, the Olympic's major legacy will be the OTC, which will act as a major regional sports hub for South America and the rest of the world. The OTC will enhance the preparation of the Brazilian and other teams for both the 2012 and 2016 Olympic Games, as well as numerous other competitions. It will also support programmes in its neighbouring communities to stimulate sports participation and healthy lifestyles.

The total cost of delivering the venues and infrastructure for the Games is currently estimated at over US\$ 22 billion - this excludes facilities and projects that have already been concluded but includes projects that, not Olympic in nature, have been brought forward to be ready for the Games, like Porto Maravilha. It also includes ongoing projects, like the refurbishment of Maracanã stadium in Rio de Janeiro and the environmental programmes promoted by the state of Rio. Private development in the various villages will form the biggest part of the total investment. The most significant public expenditure will be in transport infrastructure. Sports venues and facilities account for under 10% of total expenditure. The US\$358m that are estimated to be managed by the Local Organising Committee (Rio 2016) approximately 3% of the total capital expenditure for construction work, corresponds both to temporary buildings and to temporary conversion of existing structures.

Table 6 Total expenditure by workstream

By sector (Million USD)	Permanent	Temporary	Total	%
Sports and Facilities	1,315	360	1,675	7
Urban legacy & villages	10,753	140	10,893	48
Transport	7,833	-	7,833	35
Environment	1,235	-	1,235	5
Security	970	-	970	4
Total	22,107	500	22,607	100

N.B. While every effort was made to ensure the accuracy of the numbers presented, they represent an estimate of total cost and as such, are likely to evolve as projects get under way. This is particularly true of the figures relating to the venues, as the nature of some venues (permanent vs temporary) is still to be defined. The same applies to the actual budget available to deliver these venues.

3.1 General Games Setup

Two main agencies are tasked with the delivery of the Olympic Games: the *Autoridade Publica Olimpica (APO)* equivalent to London 2012's Olympic Delivery Authority (ODA) which is tasked with overseeing the delivery of all Olympic projects and Rio 2016, the organising committee of the Games, with a mandate to deliver the actual event and ensure compliance with IOC requirements.

The two will closely cooperate with the Federal, State and Municipal governments, who will be the delivery partners of the projects that fall under their respective jurisdictions.

The Provisional Measure that defines the Olympic delivery bodies, MPV503/2010¹³, was proposed by President Lula in September 2010. It included, in addition to the APO and Rio 2016, a delivery partner named Brasil 2016. In February 2011, President Dilma approved changes to the measure that eliminate this structure, transferring the responsibility for delivery of projects to the three government levels.

An Olympic Board, reporting directly to the President of the Republic, mandated with the coordination of stakeholders and the body to which policy issues will be escalated, will be formed by:

- The ODA Chairman, Henrique Meirelles, former Central Bank governor
- A government minister representing a Federal inter-Ministerial Committee
- The Governor of the State of Rio de Janeiro, Sergio Cabral
- The Mayor of the City of Rio de Janeiro, Eduardo Paes
- The Chairman of the organising committee Rio 2016, Leonardo Gryner
- The President of the Brazilian Olympic Committee, Carlos Arthur Nuzman, and
- The President of the Brazilian Paralympic Committee, Andrew Parsons

3.1.1 The London Precedent

The London 2012 Games will serve as a precedent for the 2016 Games. The work of the British government is being closely followed by the organisers of the Rio Games, who want to learn from the London experience and hold a Games 'at least as sustainable as 2012'.

In order to establish a framework for commercial and trade co-operation, coupled with technology and knowledge transfer in the context of the shared Olympic challenge, a Host 2 Host agreement was signed between the two governments in March 2010. A UKTI initiative, the programme is designed to share business opportunities and best practice between host nations. This was preceded by a sports-focused cooperation agreement between the Department for Culture, Media and Sport and the Brazilian Ministry of Sports.

The current administrations are setting up a Governmental Programme of Observation and Knowledge Management and Transfer between the two countries with a view to creating a database and setting up a register documenting all government actions related to planning, delivering and closing the 2012 Games, leaving the process as a legacy for future host cities.

The Brazilian government expects to obtain expertise in project management, project implementation, procurement methods and purchasing procedures in areas such as the construction of the villages, waste treatment, infrastructure (transport, airports), security integration, crowd movement, immigration and customs, communications, sustainability and governance.

In October 2010 yet another agreement, called *Conexão Rio-Londres*, was signed between the cities of London and Rio de Janeiro.

And finally, Brazil is planning a year-long jamboree in 2012, in London, to promote Brazilian culture, tourism and trade. The venue chosen for this Brazil House is Somerset House, on the Strand.



host2host
winning partnerships

3 The Rio 2016 Olympic and Paralympic Games (cont'd)

3.1.2 APO

The Autoridade Publica Olimpica (APO) is the corresponding body to London 2012's Olympic Delivery Authority (ODA). The APO will be a cross-government agency composed of representatives of all three tiers of government. Its aim is to oversee, though not directly manage, the correct use of public funds for Olympics-related construction work, thus ensuring that the legacy commitments made by Rio's bid to host the Games will materialise.

The responsibilities of the APO are set out in a provisional measure proposed by the Federal Government, which was duly ratified by congress in March 2011. This was followed by an invitation to Henrique Meirelles, former governor of the Central Bank, to head the new structure. The process of congressional approval started after changes proposed by the President of the Republic were negotiated with the state of Rio and the Municipality. These changes pertain to the extent of executive powers that accrue to the APO. It is proposed that, contrary to the version proposed by Rouseff's predecessor, the APO should not have an executive arm, and that responsibility for the physical delivery of projects will lie with the Federal, State and Municipal governments. It remains however to be seen whether such an arrangement will be acceptable to the APO, and whether the structure would be complete without a dedicated delivery partner whose remit transcends that of the governments.

Thus the APO will coordinate, approve and monitor the actions of the three delivery partners with regards to planning and delivery of capital works, development projects and government services required for the Olympic Games. It will also serve as the liaison between the three levels of government and the organising committee Rio 2016 and ensure that there is alignment between the legacy strategy and the governments' long-term development plans.

Its model is based on that used in previous Games, like Sydney, Barcelona, and particularly London, whose ODA is emulated in administrative and operational framework. The APO's governing bodies will be a Board, a President, a Governance Office, a Treasury and an Executive Directorate.

All projects that have any bearing on the commitments underwritten by Brazil with the IOC will be monitored by the APO. Its competences include:

- Undertaking technical studies and research
- Entering contracts and establishing agreements of any nature, where pertinent to its institutional objectives
- Where pertinent to pursue the commitments with the IOC and subject to unanimous approval by the Olympic Board, the APO may, in exceptional circumstances, override the incumbent and take responsibility for planning and execution for works and services, in which case it becomes the owner of tenders and any other obligations concerning the project or projects.

The APO will be responsible for coordinating the delivery of capital works projects and Government services required specifically for the 2016 Games. This includes the design, construction and delivery of all permanent competition and non-competition venues and transport infrastructure. It will also be responsible for the legacy and sustainability aspects of the Games. The organising committee, Rio 2016, will coordinate and manage the operational aspects of Games planning and delivery, which includes carrying out all the overlay work.

Meirelles's APO will be populated by technocrats, not political appointees. While Meirelles has used this formula successfully in his previous positions, given the political importance of the Games it is likely that some opposition may be encountered, to a purely technical team, in this context. The three tiers of government are expected to demand more influence within the body. A certain amount of friction between Meirelles and the mayor of Rio was already in evidence prior to Meirelles's formal appointment. The challenge facing the APO, of managing the politics across the three levels of government and its impact on project delivery, should not be underestimated.

Officials previously associated with the proposed delivery partner, Brasil 2016, who are likely to be integrated into the future APO are:

- Ricardo Leyser, currently State Secretary for High Performance Sports
- Jeanine Pires, previous president of Brazil's Tourism Promotion Agency, EMBRATUR
- Gilberto Schweder, currently an official at the Ministry of Sport.

According to the Rio bid book, the APO will have the following divisions:

- Destination Marketing and Promotion Commission
- Olympic Traffic and Transport Division (OTTD)
- Olympic Sustainability Division
- Football Cities Coordination Group
- SENASP (Security and Safety, under the Ministry of Justice).

Destination Marketing and Promotion Commission - the marketing strategy for the Games includes comprehensive city-wide advertising, including on public transport, sale of branded merchandise and the engagement with sponsors.

The Olympic Traffic and Transport Division (OTTD) - will lead the delivery of traffic and public transport operations. Its mandate is to:

- Coordinate the planning of each of the existing Rio public transport providers, cooperating fully with the Rio 2019 Transport function
- Lead the planning and delivery of traffic management and public transport services for spectators and Games workforce
- Collaborate with Rio's public transport providers, operators and relevant authorities
- Take responsibility during operations for coordinating spectator and workforce transport systems, through a Traffic and Transport Coordination Centre, in close coordination with the Rio 2016 Games Transport Operation Centre.¹⁴

The Olympic Sustainability Division (OSD) - provides leadership and management to the environmental and sustainable projects of the Games. It will, therefore, integrate all public authorities involved in the delivery of such projects. The OSD will have the following responsibilities:

- Policy coordination, planning, delivery capability, research measurement, accountability
- Providing input to the development and oversight of Rio 2016's Sustainability Management Plan
- Defining and monitoring environment and sustainability indicators and providing objective evidence that goals are met
- Coordinating stakeholder engagement
- Identifying, analysing and prioritising key issues and reporting on progress.

SENASP is Brazil's National Public Security Secretariat - it is tasked with the integration of the activities of all the security entities involved directly or indirectly with the Games, determining the Games-related resource requirements of each of the organisations involved in the Olympic effort, and providing input to the planning process for the Games security overlay. As operational planning for the Games becomes more detailed, SENASP will coordinate the work of the Federal, State and City security agencies and start detailed venue security planning with Rio 2016's security directorate, to ensure compliance with Games security policies and protocols.

The expenses of the APO will be the responsibility of the institutions represented therein. An estimated 181 people will be employed by the agency, on three-year contracts.

The APO's remit and operations will be terminated on December 31st 2018¹⁵.

The legislation that regulates the creation of the APO is Provisional Measure 503, available at http://www.planalto.gov.br/ccivil_03/_Ato2007-2010/2010/Mpv/503.htm

3 The Rio 2016 Olympic and Paralympic Games (cont'd)

3.1.3 Rio 2016

The local organising committee of the 2016 Olympic Games is called Rio 2016. The committee will coordinate and manage operational aspects of Games planning and delivery. As a franchisee of the International Olympic Committee, it represents its views and ensures compliance with its requirements and timescales.

Rio 2016 contains a number of directorates. The role of each directorate is to pursue the goals set by the International Olympic Committee for part of the operation of the Games under its remit, following a scope of works. While not the ultimate project-commissioning body, Rio 2016 sets the level of specification to be met by the delivery partners.

Rio 2016 is headed by Carlos Arthur Nuzman, its president. Leonardo Grynner is its CEO, and the main directorates and directors within the committee are:

- Sports Agberto Guimaraes
- Institutional Relations Agemar Santos
- Planning and Control Alexandre Techima
- Strategy Carlos Luiz Martins
- Communications Carlos Villanova
- Commercial Maggie Sanchez
- Relations with NOCs and Olympic Village Mário Cilenti
- Human Resources Henrique Gonzalez
- Finance Fernando Nóbrega
- Transportation Regina Oliveira
- Venues Luis Henrique Ferreira
- Marketing Beth Lula

The operational project is undertaken by Rio 2016's design team, who test all venues for all requirements in the areas of sport, logistics, and spectator services. The whole operation is scrutinised, existing venues are tested for purpose, and a scope of works is created by Rio 2016. Where any temporary construction work is needed, this will fall under Rio 2016's remit. That includes temporary adaptation of existing venues and altogether new temporary venues, like the Copacabana stadium.

Rio 2016's budget comes from the IOC; private sponsors; publicity; official suppliers and ticket and product sales. Originally expected to receive public funds for its activities, the committee has been so successful in attracting sponsorship agreements that it has waived its right to public funds, thereby remaining what amounts to a private company, not bound by the requirements that come attached with the receipt of public money. The committee, therefore, retains discretionary power over its budget and can commission work directly from third parties, bypassing the traditional (and complex/time-consuming) tendering process. Its main role, as enforcer of IOC requirements, though, requires that it seek to engage only with the most competent and professional of firms.

Due to the temporary nature of the construction projects run by Rio 2016, building work will start only in the run-up to the Games, from 2014 onwards. Planning, however, is already under way, so the committee already engages private companies with a view to providing consultancy in a number of areas, from venues to equipment suppliers.

Where expertise is sought in areas the UK excels in, the committee welcomes the contribution of British firms. The committee will engage with firms that have a product or service that is superior to that commonly found in the market and that want to invest in Brazil. All commercial requests and proposals are dealt with by the Institutional Directorate headed by Agemar Santos.

3.1.4 Ministério do Esporte

Until the APO is up and running, the Ministry of Sport will lead the Olympic effort on behalf of the Federal Government.

The current minister, Orlando Silva, was hailed as a favourite to head the APO but was side-lined by President Dilma when she took up office. His office has, however, been actively pursuing a relationship with the British Government, through its Government Olympic Executive, in order to establish the Governmental Programme of Observation and Knowledge Management and Transfer referred to in section 3.1.1 above.

3.1.5 State of Rio de Janeiro

The State of Rio will be a major stakeholder in the 2016 Games. It has jurisdiction over some of the key infrastructure for the city of Rio, including sanitation work and all track-based transport.

While these are projects that are strategically important for Rio de Janeiro and would be implemented in due course, the Olympics have created a political urgency for timely delivery that the state responded to by placing all Olympic projects under the supervision of EGP-RIO (Escritório de Gerenciamento de Projetos do Governo do Estado do Rio [Office of Project Management]) a dedicated project-delivery office, contained within the state's Cabinet Office.

The state is also the main security provider for the event and is implementing a host of capacity-building measures, which will leave a legacy that will last beyond the Games and which should result in an overhaul of security operations in the State of Rio.

As a provider of infrastructure, the state of Rio has a culture of planning. In recognition of poor performance in the areas of sustainability and accessibility to date, the State sees the Olympic and Paralympic Games as an opportunity to also create a legacy in sustainability and accessibility planning, and intends to raise awareness of the issues within its delivery team.

The State of Rio's organogramme of the Olympic delivery team is already in place. Only the directors for Culture & Education and Sustainability remain to be nominated. The structure is as follows:

• Environment	Vinicius Bezerra
• Infrastructure	Marcelo Burlamaqui
• Venues	Marcelo Burlamaqui
• Transport	Livia Bastos
• Security	Gardênia Brandão
• Guarantees	Myrthes Ferreira
• Communications	Cristiana Rocha
• Culture & Education	to be appointed
• Sustainability	to be appointed

The projects under the state's direct responsibility cover areas like Transport, Environment, Security and Venues. The State is committed to having an impact on security and sustainability within the APO. The projects under its remit are described in section 3.3.

State officials think the UK experience in delivering a sustainable Games will be an important reference for Rio. However, the ability to maintain the momentum created by the Games and convert it in to a lasting potential benefit for tourism is also of interest and here the London experience is also being keenly followed.

3.1.6 Rio 2014-2016

Rio 2014-2016 is a public company, financed by the Rio Municipality, tasked with the coordination of all FIFA World Cup 2014 and 2016 Olympic Games-related projects that take place within its borders. With regards to Municipality-led projects, while the incumbent municipal departments will promote, manage, approve and commission any work that falls under their remit, Rio 2014-2016 will act as the single point of contact between them and the non-municipal stakeholders, like the Brazilian Football Committee, FIFA, Rio 2016, the International Olympic Committee and the state and federal governments.

The main areas that Rio 2014-2016 will be involved in are Infrastructure, Transport, Sustainability and Social and Urban Development. While its structure and responsibilities are still being defined, a number of projects that are already under way or soon will be have already been highlighted as follows:

- All the new BRT lines within the metropolitan area
- The Olympic Port, which was launched as a national competition in November 2010
- The privately-built Olympic Village
- The Maracanã stadium and surrounding area
- The João Havelange (Engenhão) stadium and surrounding area
- The Olympic Park competition, launched in May 2011
- The Morar Carioca competition, for the improvement of 500 unplanned settlements (favelas, in Portuguese)
- The environmental remediation work on the Bay of Jacarepaguá
- The planting of 10 million trees throughout the metropolitan area (out of a total of 24m).

With a team of 25 at the moment, the company is expected to grow to 35 in the near future.

3 The Rio 2016 Olympic and Paralympic Games (cont'd)

3.2 Venues

Most venues built for the 2007 Pan American Games were designed to fulfil Olympic requirements.

Where there is no additional legacy requirement, only temporary works will be required to prepare these venues for the 2016 Games. Where significant modifications are required to existing venues, and there are legacy requirements, permanent works will be carried out, and financed by the relevant level of government.

Completely new permanent venues will be built for the Olympic Training Centre in Barra da Tijuca and the X Park, a radical sports park, in Deodoro. These venues will remain in legacy. Some temporary structures will also be built, where no legacy requirements exist.

The estimated cost and timescale of all venues, as of March 2011, is provided in Table 7, on page 38.



Figure 2
The Olympic Park in Barra da Tijuca, EGP-RIO

3.2.1 Existing venues, no permanent works required

Rio Olympic Arena, Barra

Existing venue, built for the Pan American Games in 2007. It is Olympic sized. It is owned by the Municipality of Rio de Janeiro and operated by GL Eventos. It will host events in legacy mode.

- Wheelchair basketball
- Gymnastics
- Artistic
- Rhythmic
- Trampoline

Riocentro Hall 2, Barra

Riocentro is Rio's main exhibition and convention centre, and will undergo refurbishment to hold some Olympic events.

Riocentro is managed by French event-management company GL Eventos. The works will be temporary.

Hall 2 will have capacity for 9,000 spectators.

- Boxing

Riocentro Pavilhão 3, Barra

Hall 3 will host 5,000 spectators.

- Table Tennis

Riocentro Hall 4, Barra

Hall 4 will have capacity for 6,500 spectators.

- Badminton

Maracanãzinho Sports Hall, Maracanã

Refurbished for the Pan American Games, the arena is being upgraded for the FIFA World Cup in 2014 and also the Olympics.

- Volleyball

Fonte Nova Stadium, Salvador, Bahia

The existing stadium was demolished, and a new one is currently being built in its stead for the FIFA World Cup in 2014.

- Football

Mineirão Stadium, Belo Horizonte, Minas Gerais

Built in 1965, the stadium is being totally refurbished for the FIFA World Cup in 2014.

- Football

Morumbi Stadium, São Paulo

Built in 1960, the stadium is being refurbished for the FIFA World Cup in 2014.

- Football

Mané Garrincha Stadium, Brasília

Built in 1974, the stadium is being refurbished for the FIFA World Cup in 2014.

- Football

Estádio São Januário, São Cristóvão

No work will be needed in this existing venue, property of Vasco da Gama Football Club.

- Rugby sevens



3 The Rio 2016 Olympic and Paralympic Games (cont'd)

3.2.2 Existing venues, permanent works required

National Equestrian Centre, Deodoro

An 82,000sqm existing facility, built for the 2007 Pan American Games, with a capacity of 14,000 seated and 20,000 standing spectators. It will be expanded for the Olympic Games, and will remain in legacy.

- Equestrian



Figure 3

National Equestrian Centre, Deodoro, EGP-RIO

National Shooting Centre, Deodoro

Also built for the Pan American Games, the centre will be upgraded for the Olympics. It will remain in legacy. The public capacity is: finals hall 1,600; pit and skeet (finals) 2,000; pit and skeet (competitions) 1,000; 10m-target 1,000; 25m-target 500; 50m-target 750.

- Shooting

Maria Lenk Aquatic Centre, Barra

Existing aquatics centre, built for the Pan American Games in 2007. Owned by the Municipality of Rio de Janeiro and managed by the Brazilian Olympic Committee. In legacy mode, the centre will become part of the Olympic Training Centre.

- Water polo
- Diving

Olympic Velodrome, Barra

The Velodrome was built for the Pan American Games in 2007. Discussions are still ongoing whether it will only be upgraded to an Olympic standard, or whether it should be demolished and replaced by a new building to remain in legacy.

- Track cycling

Glória Marina, Glória

A temporary stadium will be built with capacity for 10,000 spectators. In legacy new competition and exhibition areas will be left.

- Sailing

João Havelange Stadium, Engenho de Dentro

Built for the Pan American Games, the stadium will be expanded from 45,000 seats to 60,000 for the Olympics. Its surroundings will also be improved.

- Athletics

Sambódromo, Maracanã

The existing facility, host to Rio's Carnival, will be totally refurbished for the Games.

- Archery
- Athletics (Marathon)



Figure 4

Sambódromo, Maracanã, EGP-RIO

3 The Rio 2016 Olympic and Paralympic Games (cont'd)

Ancillary rowing facilities, Lagoa Rodrigo de Freitas

The 10,000 spectator stand built for the Games will be temporary. Training facilities and a new boat house will remain in legacy.

- Rowing
- Canoe/Kayak



Figure 5

Rowing facilities, Lagoa Rodrigo de Freitas

Maracanã Stadium, Maracanã

A significant refurbishment is already under way for the FIFA World Cup 2014, which includes improvements to the stadium's surroundings.

- Opening and Closing Ceremonies
- Football



Figure 6

Maracanã stadium, before and after, EGP-RIO

3 The Rio 2016 Olympic and Paralympic Games (cont'd)

3.2.3 New permanent venues to be built

Olympic Tennis Centre, Barra

New permanent venue in the Olympic Park. Temporary stands will be built for the Games. In legacy 10 courts will be left as part of the Olympic Training Centre.

- Tennis

Olympic Training Centre (OTC), Barra

New permanent venue in the Olympic Park, the OTC will be a multi-purpose 65,000sqm (45,000 covered) venue. As part of the sustainability commitments of the bid, the venue will be designed using new environmental technologies and implementing established Environmentally Sustainable Design (ESD) principles. The OTC will have the following environmental features: a solar skin, clean energy, water conservation, natural ventilation, sustainable materials. All the halls of the OTC will remain in legacy.

OTC - Hall 1

Hall 1 will have capacity for 16,000 spectators (5,000 permanent seats plus 11,000 temporary seats).

- Basketball
- Wheelchair rugby

OTC - Hall 2

Hall 2 will have capacity for 10,000 spectators. The Judo facilities will remain in legacy.

- Boccia
- Judo
- Taekwondo

OTC - Hall 3

The Wrestling facilities will remain in legacy.

- Wrestling
- Volleyball

OTC - Hall 4

Hall 4 will have capacity for 12,000 spectators. The Handball facilities will remain in legacy.

- Paralympic goalball
- Handball

Deodoro Arena, Deodoro

A 5,000-spectator new arena in Deodoro, the facility will remain in legacy as part of the Deodoro OTC.

- Fencing

Olympic BMX Centre, Deodoro

A new venue, the BMX Centre will have temporary capacity for 7,500 spectators. It will remain in legacy as part of the radical sports park of Deodoro.

- BMX Cycling

Olympic Whitewater Stadium, Deodoro

A new permanent facility that will remain in legacy. It will have a capacity of 8,000 spectators.

- Canoe / Kayak

Main Press Centre, Barra

The MPC will have 1,000 workstations in an open plan area of 7,500sqm over four storeys. There will be 12,000sqm of office space and an auditorium.

International Broadcasting Centre, Barra

The IBC will have an area of 40,000sqm and 6-9m clearance studios, in addition to a 15,000sqm office area.

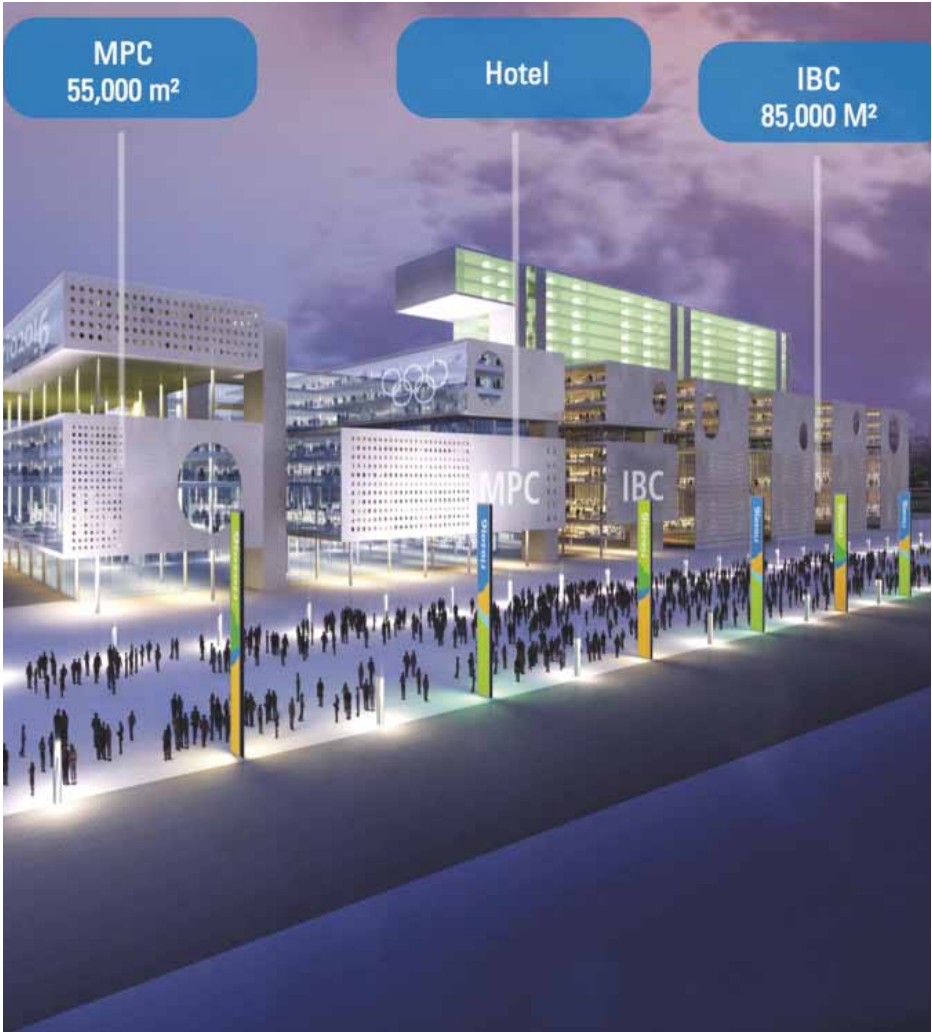


Figure 7
The IBC and MPC, EGP-RIO

3 The Rio 2016 Olympic and Paralympic Games (cont'd)

Olympic Park

The masterplan of the Olympic Park in Barra da Tijuca was not budgeted in the original bid book for the 2016 Games. The need for a park masterplan was, however, identified subsequently and an international design competition was launched on May 2nd 2011 by the Brazilian Institute of Architects and the Municipality of Rio de Janeiro.

The 2016 Olympic Park will host most of the sports competitions in 2016, including judo, volleyball, basketball, cycling, hockey, tennis, taekwondo, swimming, wrestling and handball, as well as the International Broadcasting Centre (IBC) and the Main Press Centre (MPC), in a total area of 1.2 million square meters on Avenida Abelardo Bueno.

For the two-month one-stage competition - with a deadline that has now been extended to the end of July 2011 - proposals for all three stages must be submitted:

- The Games Mode, ensuring the best operational conditions for the event
- The Transition Mode, mediating between the Games and the Legacy Modes
- The Legacy Mode, when private commercial development will take place on approximately 60% of the area.

The philosophy of the competition is to bring about a positive impact to the area during all modes, proposing innovative solutions for accessibility, environment, landscape and social and sports development, at an estimated cost ranging between US\$250m and US\$350m.

Teams will need to be architect or urban planner led. No prior registration with the Brazilian Institution of Architects is required. An official translation of the leading professional's accreditation is, however, mandatory and experience in two masterplans over 250,000sqm and one urban design/landscape project over 100,000sqm is required.

The three best proposals will be awarded R\$100,000, R\$50,000 and R\$20,000 and the winning team will be invited to develop the project up to the construction drawing stage.

There is great interest in this competition at all levels of the construction industry in Brazil:

- Contractors see opportunities for construction work and eventually the possibility of developing a model similar to that of the Port of Rio, where urban services are provided under concession

- Engineers will have the opportunity to plan and design urban infrastructure to a higher spec than is common in Brazil, either in association with or as service providers to contractors
- Architects are interested in creating what will be a new paradigm of urban sustainability in the country

As an international competition, the Olympic Park is expected to draw entries from major international designers and planners. The unique selling point of British firms is the recent Olympic experience, which is highly valued, though not always well understood in breadth and scope, by Brazilian companies.

Interest in masterplanning services and the full integration of utilities and services is high, if only because traditionally little coordination has existed among different utility providers. With sustainability concerns normally absent from public tenders, it is anticipated that a more ambitious programme will require expertise that is not available within most engineering companies. This is recognised by some of the indigenous engineering companies, though by no means all. Finally, architects see association with international firms, particularly those with Olympic experience, as a great competitive advantage. British firms are in a good position to become involved at all levels, offering consultancy to contractors and associating with engineers and architects.

More information about the competition can be found (in English) at <http://concursoparqueolimpicorio2016.iabrj.org.br>

3.2.4 Temporary venues

With very little experience in the construction of high-spec temporary structures, the Brazilian market is not well-placed to deliver the most ambitious of the structures described below. British firms are, however, very well qualified to do so, particularly given the experience of the London Games. This expertise is a great asset to British industry and can be an important contribution to the Rio Olympic effort.

The UKTI team in Rio de Janeiro assists British business in their pursuit of all opportunities linked to Rio 2016. The team is well placed, therefore, to assist those firms with the credentials to plan and build iconic temporary structures, to realise the opportunities that should arise from the portfolio of temporary projects for 2016.

Olympic Aquatics Centre, Barra

The centre will now be temporary, and not a permanent structure, as envisaged initially in the bid. Its timescale and budget are still being planned by Rio 2016. The capacity of the centre will be 18,000 seats.

- Swimming
- Synchronised swimming

Olympic Hockey Centre, Barra

Temporary venue in the Olympic Park. A hockey field will be left in legacy.

- Hockey
- 5-a-side football
- 7-a-side football

Riocentro Hall 6, Barra

Hall 6 will be a 14,000sqm temporary structure with capacity for 6,500 spectators.

- Weightlifting

Copacabana Stadium, Copacabana

The stadium will be a temporary structure for 12,000 spectators on Copacabana Beach.

- Beach volleyball

Copacabana Fort, Copacabana

An existing structure, the fort will see the construction of a temporary stand for 5,000 spectators. A new pier will be left in legacy.

- Marathon swimming
- Triathlon

Flamengo Park, Flamengo

Temporary spectator facilities will be built on Flamengo Park.

- Race walking
- Road cycling

Deodoro Modern Pentathlon Park, Deodoro

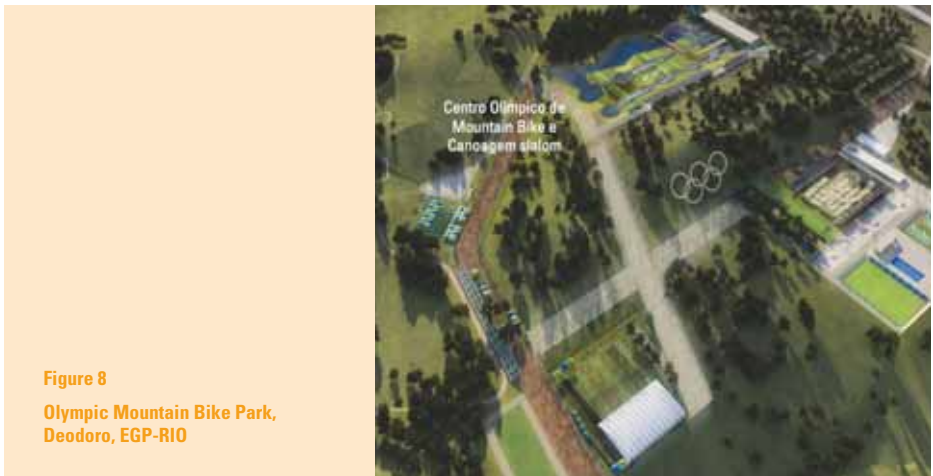
A temporary 15,000-seat stadium will be built for the pentathlon. The actual pentathlon facility will remain in legacy.

- Modern Pentathlon

Olympic Mountain Bike Park, Deodoro

The Park will be a temporary facility with seating capacity of 5,000. Total standing capacity will be 20,000. Part of the course will remain in legacy.

- Mountain Biking



3 The Rio 2016 Olympic and Paralympic Games (cont'd)

Table 7 investment in venues, from Rio bid document, Rio 2016 and State of Rio, US\$ million

Project	Permanent venues / projects				Temporary venues				
	Investment USD millions	Source of funding	Start date	End date	Investment USD millions	Source of funding	Start date	End date	
Existing venues, no permanent works required									
Rio Olympic Arena	-	-	-	-	4.88	Rio2016	2015	2016	
Riocentro - Hall 2	-	-	-	-	5.78	Rio2016	2015	2016	
Riocentro - Hall 3	-	-	-	-	7.72	Rio2016	2015	2016	
Riocentro - Hall 4	-	-	-	-	7.58	Rio2016	2015	2016	
Maracanãzinho Sports Hall	-	-	-	-	3.26	Rio2016	2015	2016	
Fonte Nova Stadium (Salvador - BA)	-	-	2010	2012	4.45	Rio2016	2015	2016	
Mineirão Stadium (Belo Horizonte - MG)	-	-	2010	2012	4.45	Rio2016	2015	2016	
Morumbi Stadium (São Paulo - SP)	-	-	2010	2012	4.45	Rio2016	2015	2016	
Mané Garrincha Stadium (Brasília - DF)	-	-	2010	2012	4.45	Rio2016	2015	2016	
São Januário Stadium	-	-	-	-	-	-	-	-	
Total	-				47.8				
Existing venues, permanent works required									
National Equestrian Centre	12.82	FG	2010*	2011	11.46	Rio2016	2015	2016	
National Shooting Centre	3.16	FG	2010*	2011	5.91	Rio2016	2015	2016	
Maria Lenk Aquatic Centre	10.32	Mun	2010*	2011	7.39	Rio2016	2015	2016	
Olympic Velodrome	41.85	Mun	2013	2015	5.54	Rio2016	2015	2016	
Glória Marina	11.31	Mun	2014	2015	15.04	Rio2016	2015	2016	
João Havelange Stadium	49.25	Mun	2013	2015	13.37	Rio2016	2015	2016	
Sambódromo	16.06	Mun	2013	2015	11.07	Rio2016	2015	2016	
Ancillary rowing facilities, Lagoa Rodrigues de Freitas	2.70	SG	2014	2015	21.88	Rio2016	2015	2016	
Refurbishment of Maracanã Stadium	548.99	SG	2010	2014	6.65	Rio2016	2015	2016	
Total	696.5				98.3				
New permanent venues to be built									
Olympic Tennis Centre	55.04	FG	2013	2015	19.92	Rio2016	2015	2016	
Olympic Training Centre - Hall 1	58.25	FG	2009*	2011	9.49	Rio2016	2015	2016	
Olympic Training Centre - Hall 2	58.25	FG	2009*	2011	9.77	Rio2016	2015	2016	
Olympic Training Centre - Hall 3	58.25	FG	2009*	2011	9.40	Rio2016	2015	2016	
Olympic Training Centre - Hall 4	58.25	FG	2009*	2011	11.28	Rio2016	2015	2016	
Deodoro Arena	49.06	FG	2009*	2011	5.95	Rio2016	2015	2016	
Olympic BMX Centre	7.86	FG	2012	2015	6.80	Rio2016	2015	2016	
Olympic Whitewater Stadium	31.22	FG	2012	2015	5.75	Rio2016	2015	2016	
MPC - Media and Press Centre	110.37	FG/Mun	2013	2015	19.40	Rio2016	2015	2016	
IBC - International Broadcasting Centre	131.82	FG/Mun	2013	2015	23.34	Rio2016	2015	2016	
Olympic Park Masterplan	-	Mun	2011**	-	-	-	-	-	
Total	618.4				121.1				

Table 7 investment in venues, from Rio bid document, Rio 2016 and State of Rio, US\$ million

Project	Permanent venues / projects				Temporary venues			
	Investment USD millions	Source of funding	Start date	End date	Investment USD millions	Source of funding	Start date	End date
Olympic Aquatics Centre***	-	-	-	-	-	Rio2016	-	-
Olympic Hockey Centre	-	-	-	-	14.74	Rio2016	2015	2016
Riocentro - Hall 6	-	-	-	-	21.46	Rio2016	2015	2016
Copacabana Stadium	-	-	-	-	12.87	Rio2016	2015	2016
Copacabana Fort	-	-	-	-	11.62	Rio2016	2015	2016
Flamengo Park	-	-	-	-	10.53	Rio2016	2015	2016
Deodoro Modern Pentathlon Park	-	-	-	-	12.36	Rio2016	2015	2016
Olympic Mountain Bike Park	-	-	-	-	10.03	Rio2016	2014	2016
Total	-				93.6			
Venues Total	1,314.8				360.0			

3.3 Infrastructure

The city of Rio will benefit from over US\$10bn of investment in infrastructure, and will emerge as a very different city in 2016, with an upgraded airport, new metro and BRT lines, improved urban rail lines, better sanitation and a reshuffled/reshaped security apparatus. These are projects that would need to be implemented sooner or later but their promotion to “Olympic” projects creates a focus and political will that may otherwise not have existed.

The legacy of the Games, funded by each of the three tiers of government, will come under four main headings: Environment and sustainability, Transport, Security and Urban regeneration.

3.3.1 Environment and Sustainability

Rio’s bid created the vision of a ‘Green Games for a Blue Planet’. Its Sustainability Management Plan (SMP) is based on three pillars: planet, people and prosperity which will integrate economic, environmental, and social elements of the vision. Table 24 on page 87, sets out the specific actions under the Sustainability Management Plan.

During Rio’s bid a special environment committee was established to co-ordinate across all three levels of government. The governments have agreed to create an Olympic Sustainability Division (OSD) a special purpose agency which will provide practical operational delivery capability

during all stages of the Games. In addition to developing and co-ordinating the SMP, the Rio 2016 Sustainability function will be the point of contact to ensure that the IOC’s Technical Manual for Environment and Sustainability and Olympic Games Impact requirements are followed in the SMP and within the OSD’s framework.

Guarantees have been provided by all three levels of government and the relevant competent authorities and developers that all the necessary construction work will comply with local, regional, and national regulations and with international agreements and protocols regarding planning construction and protection of the environment. An EIA (environmental impact assessment) is required by legislation for any development project. For existing facilities no EIA is required. However, retrofitting assessments introducing sustainability building parameters will be undertaken. Rio 2016 will also incorporate a sustainability code into the pre-selection phase of all providers of goods or services.

Rio 2016 and the Government have identified three Games-related pilot projects to advance the sustainable development agenda in Brazil:

1. Construction pilot project: the indoor training halls of the Olympic Training Centre (OTC) will be designed using new environmental technologies and implementing established Environmentally Sustainable Design (ESD) principles.

3 The Rio 2016 Olympic and Paralympic Games (cont'd)

With a total footprint of 65,000sqm, this venue will be at the heart of the Rio Olympic Park with the following environmental features: a solar skin, clean energy, water conservation, natural ventilation and sustainable materials. This pilot project will include a series of applied research projects to advance Brazilian and global technologies around sustainable sport venues

2. Test of a next generation hybrid bus operated by fuel cells and/or electrical sources.

3. Using carbon credit market revenues in social communities – using the global carbon credit market and micro credit institutions to enhance social housing and solid waste recycling.

The environmental projects to be carried out by the State of Rio are listed with a brief description in Table 8 and Table 9.

Table 8 Environmental programmes (1)

Project	Permanent venues / projects			
	Investment USD millions	Source of funding	Start date	End date
Environment				
Water at School (Olimpiada Agenda Água Rio 2016) A programme designed to reach 3,000 students from riparian areas throughout the Rio Metropolitan Area to promote water conservation practices.	1.01	SG	-	-
Dredging of Cunha Canal Programme for the regeneration of Fundao Island's Fundao and Cunha Canals. The following projects will take place: - Dredging of 3,100,000 cubic metres of sediment - Landscaping and masterplanning of Fundao Island - Regeneration of 165,000sqm of swamp - Sanitation and masterplanning of Fundao's residential area - Land reclamation and landscaping for a Geobag field - Deepening of Fundao Canal to a minimum depth of eight meters in the Caju shipbuilding yards - Environmental education for the community - Construction of a cable-staid bridge linking Fundao Island to Linha Vermelha highway - Construction of new road access to the Island from northern Rio	174.39	SG	Ongoing	-
Ecobarriers Installation of nine new and repair of six existing garbage-collecting floating barriers on the Bay of Guanabara and Jacarepagua lagoons.	0.84	SG	Ongoing	-
Removal of landfill sites The removal of landfill sites will take place in Jardim Gramacho, where about 30 such illegal sites have been identified. The swamp habitat regeneration of the areas affected will follow. Four municipal landfill sites that contaminate waterways flowing to the Bay of Guanabara will be upgraded (Paracambi, Guapimirim, Mage and Belford Roxo).	23.87	SG	-	-
Carbon offsetting Is sought through the planting of 24m trees throughout the State of Rio, 3m of which in Tijuca Forest alone.	29.26	SG	-	-

Table 8 Environmental programmes (1)

Project	Permanent venues / projects			
	Investment USD millions	Source of funding	Start date	End date
Environment				
<p>Programme for mobile monitoring of emissions Will be carried out, with the installation and operation of a network of six fixed, ten mobile and 15 portable air quality monitoring stations. The stations will be installed near the competition venues, accommodation of athletes, and main roads used to reach them.</p>	23.87	SG	-	-
<p>Vegetable oil reuse programme Expansion of existing programme PROVE This is the expansion to the Olympic clusters of an existing programme for the collection and reuse of vegetable oil.</p>	1.79	SG	Ongoing	-
<p>Regeneration and flood control for Iguaçú, Botas, and Sarapuí rivers PHASE 01 In three phases, the regeneration and flood control for Iguaçú, Botas, and Sarapuí rivers will consist of the environmental remediation of the three rivers, their dredging and the resettlement of riparian dwellers.</p>	113.38	SG	-	-
<p>Regeneration and flood control for Iguaçú, Botas, and Sarapuí rivers PHASE 02 Phase 2 will consist of further dredging of the waterways.</p>	49.84	SG	-	-
<p>Regeneration and flood control for Iguaçú, Botas, and Sarapuí rivers PHASE 03 Phase 3 will see the masterplanning and landscaping of the banks of the rivers, further resettlement and the construction of flood control measures.</p>	370.08	SG	-	-
<p>Environmental improvements to Rodrigo de Freitas Lagoon Refurbishment of existing and construction of new sewage lift stations around the Lagoon (Jardim de Allah: refurbishment; Cantagalo, Caiçaras and Farme de Amoedo: new). Renovation of the drainage ring of the Lagoon. Sewage network of the Humaita Basin. Replacement of collectors at Jardim Botânico. Replacement of pressure pipes for lift station at Leblon. Partial replacement of pressure pipes at Ipanema.</p>	11.93	SG	-	-



3 The Rio 2016 Olympic and Paralympic Games (cont'd)

Table 9 Environmental programmes (2)

Project	Permanent venues / projects			
	Investment USD millions	Source of funding	Start date	End date
Environment				
PSBJ Sanitation Programme for Barra da Tijuca, Recreio dos Bandeirantes e Jacarepaguá. Sanitation for the Jacarepaguá Basin. Sanitation network for Jacarepaguá Basin, with lift stations, pressure pipes, trunk collectors, collectors and domestic connections.	27.08	SG	Ongoing	-
PSBJ Sanitation Programme for Barra da Tijuca, Recreio dos Bandeirantes e Jacarepaguá. Sanitation for the Itanhangá Basin Sanitation for eight basins: Itanhangá 2, Rio das Pedras 2, Lagoa da Tijuca 2, Itanhangá 1, Armando Lombardi, Joatinga, Barrinha and Jardim Oceânico.	29.84	SG	Ongoing	-
PSBJ Sanitation Programme for Barra da Tijuca, Recreio dos Bandeirantes e Jacarepaguá. Sanitation for Avenida Ayrton Senna Sanitation for Abelardo Bueno Avenue in Barra da Tijuca, with lift stations, pressure pipes, trunk collectors, collectors and domestic connections.	59.67	SG	Ongoing	-
PSBJ Sanitation Programme for Barra da Tijuca, Recreio dos Bandeirantes e Jacarepaguá. Complementary sanitation for Barra da Tijuca New domestic connections and elimination of leakages.	23.13	SG	Ongoing	-
PSBJ Sanitation Programme for Barra da Tijuca, Recreio dos Bandeirantes e Jacarepaguá. Complementary sanitation for Recreio dos Bandeirantes, Vargem Grande and Vargem Pequena New sewage lift station in Recreio dos Bandeirantes, and renovation of 11 existing lift stations, Marapendi station, Barra STP and Barra da Tijuca marine outfall.	59.67	SG	Ongoing	-
PDBG Programme for the Decontamination of Guanabara Bay Linking of sewage network in the Sarapuí basin to Sarapuí STP	65.64	SG	Ongoing	-

Table 9 Environmental programmes (2)

Project	Permanent venues / projects			
	Investment USD millions	Source of funding	Start date	End date
Environment				
PDBG Programme for the Decontamination of Guanabara Bay Linking of trunk collector and sewage network in the Pavuna basin to Pavuna STP	143.22	SG	-	-
PDBG Programme for the Decontamination of Guanabara Bay Acquisition and installation of mechanical equipment for STP Alegria	29.84	SG	-	-
PDBG Programme for the Decontamination of Guanabara Bay Trunk Collector of Faria Timbó basin	59.67	SG	-	-
PDBG Programme for the Decontamination of Guanabara Bay Completion of Manguinhos Trunk Collector Sanitation for Maré neighbourhood	79.96	SG	-	-
PDBG Programme for the Decontamination of Guanabara Bay Regeneration of Mangu Canal Cidade Nova Trunk Collector. Manguinhos basin trunk collector, linking to STP Alegria.	119.35	SG	-	-
Environment Total	1,235.4			

More information on the sanitation and decontamination programmes can be found at:

- PSBJ www.cedae.com.br/raiz/070.asp
- PDBG www.cedae.com.br/raiz/080.asp

Tenders for water and sanitation in the state of Rio are published by CEDAE, the state water and sewage company, at www.cedae.com.br (follow link "Licitações").

Information on tenders released by all state departments can be found at www.governo.rj.gov.br/licitacoes.asp



3 The Rio 2016 Olympic and Paralympic Games (cont'd)

3.3.2 Transport

The improvements to Rio's transport network described below are all critical for the city and would be needed, regardless of the 2016 Games, in order to serve the city's inexorable expansion towards Barra da Tijuca, Rio's fastest-growing expansion area.

The Games served, however, as a catalyst for the Municipality to align timescales and tackle informality in the bus sector and helped to encourage the cooperation of State and Municipal authorities to ensure integration between the different modes of transport. The result will be a more integrated multimodal network, including bus/BRT (Municipality), suburban railways (State) and metro (State).

Rio's current transport infrastructure comprises approximately 750km of multi-lane motorways and major arterial roads, 40km of metro lines, 220km of suburban railway lines and two airports. After the Games, the city will boast a new 14km metro line, 114km of upgraded suburban train lines, and well over 50km of new BRT lines, a net investment of over US\$ 7bn. The planned new transport infrastructure of Rio can be seen in Figure 9.

The total operational fleet is intended to meet world class environmental standards in 2016 given that 100% of rail service is already electrified, 100% of the Games Family bus fleet will run on biofuel (biodiesel 20%) and 100% of other public buses will be biodiesel 5% compliant, according to the bid book. During the Olympics, a continuous zero-emissions shuttle service will circulate around the Olympic and Paralympic Village, connecting to the Transport Mall.

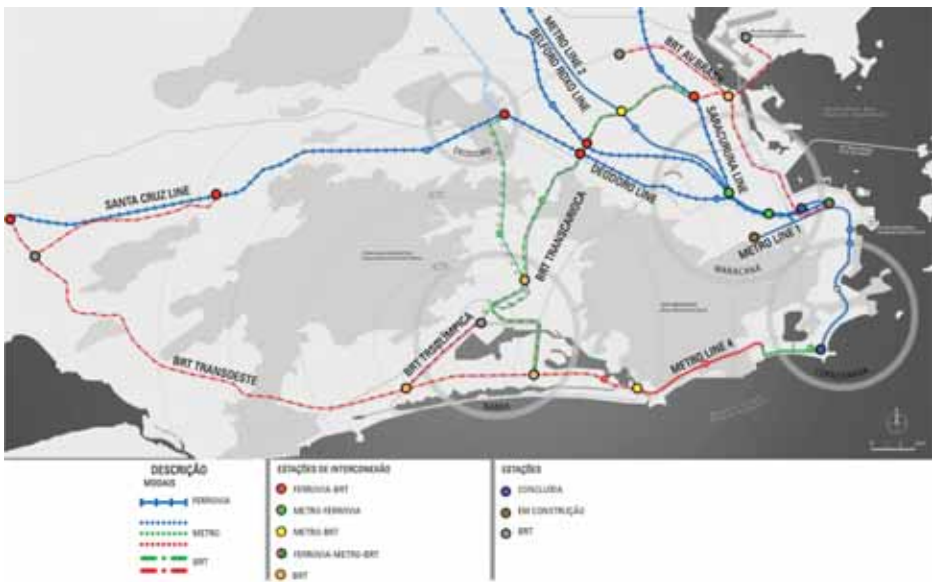


Figure 9
Rio's future transport network, 2015 (EGP-RIO)

All public transport systems in the City of Rio will need to be fully accessible by 2016, to be compliant with Federal Laws on accessibility. All the necessary infrastructure required to service accessible transport will be incorporated into the planning of Games venues.

3.3.2.1 Buses and BRT

The transportation environment in the city of Rio de Janeiro has undergone structural changes since the current administration took office. The municipality is responsible for all the buses that circulate in the city, while the subway network is owned by the state and given in concession to a private operator, Metro Rio.

Ticket integration, with the creation of Bilhete Unico, an electronic ticketing system, which has been taken up by buses and the subway system alike, was one of the current mayor's most significant achievements in the transport sector. Introducing the Bilhete Unico required the passing of new legislation regulating the services of bus operators and their consolidation from 47 companies to four. These companies were required to compete for five areas of the city in open tenders. One of the requirements for the new operators was adherence to the new ticketing system. Since this implied a 20% revenue reduction, operators had to become more efficient (Rio does not award subsidies to its public transport operations) hence the consolidation between operators. The restructuring of municipal transport focused on three streams: buses; informal transport (usually in the form of privately owned and operated vans) and taxis.

Concessions for buses are offered by area (five in total, with pre-determined lines) and include the right to operate the service and the obligation to buy and maintain the rolling stock to the municipality's specifications. The coordination between municipal (bus) and state services (subway) is not difficult. Consensus is usually found between the two governments, since integration means more passengers for both.

Currently, the four bus concessionaires serving the city of Rio are:

- Intersul (city centre and beaches)
- Internorte (Northern Rio)
- Transcarioca (Barra, Jacarepagua)
- Santa Cruz (Western Rio).

The City of Rio has plans to build a BRT network with similar features to that of Bogota, in Colombia, faced with the high cost and protracted implementation time of conventional metro systems, which in Rio grows at an average speed of one station per mandate. These new BRT lines will have total lane segregation and elevated stations. They will be:

- Transoeste - linking the suburb of Barra da Tijuca to the western suburbs. Already under construction
- Transcarioca - linking Barra da Tijuca to Penha to Galeão International Airport. Work started on the first section of the line in March 2011
- Transolimpica - from Barra da Tijuca northwards to Deodoro and Avenida Brasil. A PPP, that will include the construction of a tolled motorway with a BRT corridor in the median, is being considered to deliver the project
- Transbrasil - Along Avenida Brasil, one of northern Rio's trunk roads. Transbrasil is a particularly critical project, since Avenida Brasil absorbs a lot of intermunicipal traffic entering Rio in the peaks, from Baixada Fluminense, the city's hinterland. In its busiest sections it has volumes of 250,000 vehicles/day, with a high percentage of heavy good vehicles

The BRT lines are expected to be in operation by 2013. Only two, however, are already under way, Transoeste and Transcarioca. The remaining two will be built by the Municipality and operated by the current concessionaires, under terms and conditions set by the Municipality. Tenders for the construction of these two are expected to be released during 2011 and will include vehicle-type and emissions specifications, according to the Rio municipality.

3 The Rio 2016 Olympic and Paralympic Games (cont'd)

The municipality want to introduce the concept of Bus Rapid Service (BRS) to the city, by reserving rights of way to public transport between all the city's sub-centres, establishing a network that takes shape as the city evolves, reinforcing existing centres, supporting emerging centres, and anticipating planned centres.

This structuring network will only incrementally become fully operational. The first stage, requires the right infrastructure to be put in place, service frequency will depend on demand, with more consolidated areas having more frequent services. The municipality see the periphery being served by regular buses at first, with a view to converting the lines to BRT as demand increases. The ultimate aim of defining the BRS network is to use public transport as a planning instrument, well aligned with the city's planning objectives.

Traffic information systems have not yet been considered for the BRTs. Whether they will also be GPS controlled is a discussion that the municipality is now conducting with the concessionaires. The control centre for the municipality, however, deals mostly (80%) with traffic information, so using electronic means of monitoring traffic will become even more important in the future.

The planned BRT lines can be seen in Figure 11.

Information on municipal tenders can be found at www.doweb.rio.rj.gov.br



Figure 10

A visual representation of the BRT lines to be built in Rio, EGP-RIO

3.3.2.2 Rio Metro

Work on Rio's metro started with the upgrade of lines 1 and 2, which included the upgrade of the signalling and power supply systems, track renewal and the construction of various stations on Line 1: Uruguai in the northern suburbs and five more at its southern end, as part of the project of the new Line 4 to Barra da Tijuca.

The project for Uruguai station has been submitted for planning approval. Construction is expected to take between 24 and 30 months, finishing in 2014. The station is intended to accommodate up to 50,000 passengers/day when its integration with the bus network is complete. It was designed by JBMC Arquitetura e Urbanismo with engineering consultants Noronha Engenharia.

The concessionaire, Metro Rio, signed a new 30-year concession agreement in 2007. It was acquired in March 2009 by Invepar, a firm that is part-owned by contractor OAS, and funds Previ, Funcef and Petros. Invepar also owns LAMSA, the highway operator of Linha Amarela, Rio's only urban toll road.

Line 4 of Rio metro, over 10 years in the making since the setup of the Rio-Barra consortium, is now under way. The consortium is formed by contractors Queiroz Galvão, Odebrecht, Cowan, Carioca Christiani Nielsen and Servix. Promon Engenharia are providing engineering services to the consortium, who are faced with a task involving the tunnelling of some 5km under the densely urbanised neighbourhoods of Ipanema and Leblon, as well as through the two granite massifs of Pedra da Gávea, a listed site of outstanding natural beauty, and Tijuca.

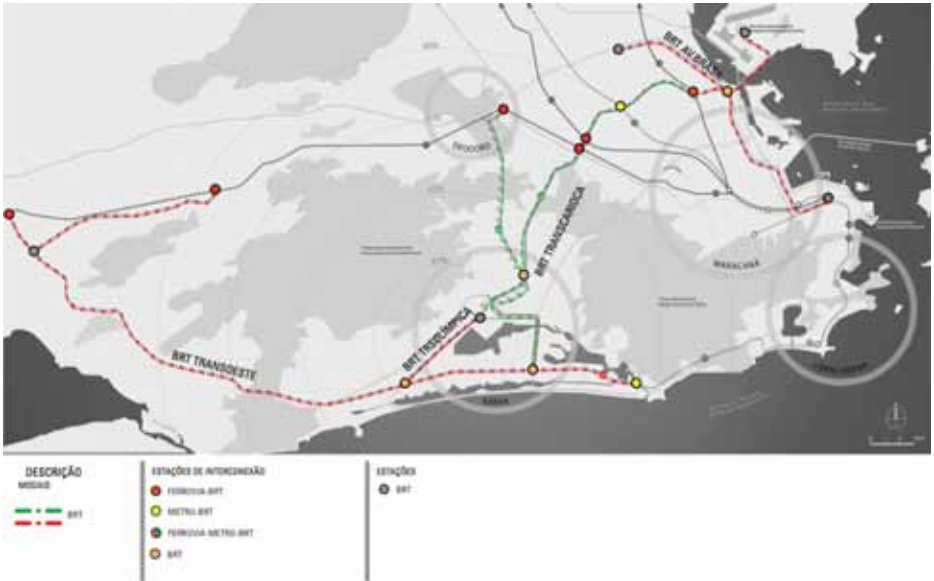


Figure 11
BRT network, 2013 (EGP-RIO)

3 The Rio 2016 Olympic and Paralympic Games (cont'd)

The total length of the line will be 14km, with six stations between the existing Ipanema - General Osório station on line 1 and Jardim Oceânico, in Barra da Tijuca, at an estimated cost of US\$2.5bn, borne by the State Government.

Phase 01 will correspond to the longest section of the line, from Jardim Oceânico in Barra da Tijuca to Gávea. Phase 02 will then provide the link between Gávea and Ipanema.

3.3.2.3 Suburban Railways

Rio's suburban railways will see improvements to their assets and operations, in the form of track and curve (catenary) renewal. Four lines will benefit from the investment of US\$280m, improving access from the northern and western suburbs to Central do Brasil, Rio's main train terminus, and a multimodal hub, with transfer facilities between mainline trains, the metro and buses. These lines are:

- Belford Roxo urban train line - Refurbishment of 14 stations and track renewal, catenary upgrade over the line's 28km length. Interchanges:
 - Metro: Triagem and Pavuna
 - BRT Transcarioca: Mercado de Madureira

- Deodoro urban train line - Refurbishment of 19 stations, new signalling, track renewal and catenary upgrade over the line's 22km length. Interchanges:
 - Metro: Central, Maracanã and São Cristóvão
 - BRT Transolímpica: Deodoro
 - BRT Transcarioca: Madureira
- Santa Cruz urban train line - Refurbishment of 13 stations, track renewal and catenary upgrade over the line's 32km length. Interchanges:
 - BRT Transoeste: Campo Grande and Santa Cruz
- Saracuruna urban train line - Refurbishment of 14 stations and track renewal over the line's 31km length
 - BRT Transcarioca: Olaria

The upgrade programme for the suburban railways includes the acquisition of 120 four-car trains, the upgrade of 94 existing trains, the renewal of workshops at São Diogo and new 300-person trains, as well as the installation of new signalling and passenger communication equipment.

The suburban railway network can be seen in Figure 9, on page 44.

Tenders for the state railways can be found on the website of the State Secretariat for Transport, SETRANS, at www.transportes.rj.gov.br/licitacoes.asp



3.3.2.4 Highways

The main thoroughfares giving access to the Olympic Park in Barra da Tijuca will benefit from upgrades financed by the Municipality, as follows:

- Avenida Ayrton Senna - 6 lanes / 3km and 12 lanes / 2km
Upgrade of entire length to 12 lanes
- Avenida Abelardo Bueno - 4 lanes / 1.5km and 10 lanes / 2.5km
Upgrade of entire length to 10 lanes
- Avenida Salvador Allende - 5 lanes / 2km and 4 lanes / 3km
Upgrade of entire length to 10 lanes.

Rio's outer Ring road, the Arco Metropolitano, will see approximately 71km of its extension paved and upgraded to a dual carriageway at a cost of US\$500m. Work is ongoing, with delays due to environmental concerns in 2009 considerably adding to the timescale.

3.3.2.5 Airports

A series of projects have already been planned as part of the PAC programme to increase Rio International Airport's capacity to 25 million per year. These are:

- Upgrade of the two runways to provide capacity to handle A380 aeroplanes - ongoing

- Refurbishment of Terminals 1 and 2 - ongoing
- Replacement of 60 passenger lifts in both terminals during 2011
- Construction of two parking areas with a total capacity of 6,000 vehicles by 2012
- Construction of an additional 12,000 square metre logistics facility to increase freight capacity to 120,000 tons per year by 2014 - ongoing
- Construction of two satellite terminals, achieving a capacity of 25 million passengers per annum by 2014

São Paulo's International Airport (Guarulhos) will support international traffic, and much of the expected domestic traffic will be served by Rio's Santos Dumont airport, which was renovated in 2007. In all four cities hosting Olympic football matches the airports will meet expected 2016 Games demand. All will undergo expansion and upgrading works ahead of the FIFA World Cup in 2014. Table 21 in Annex 02 summarises the planned capacity of all the airports in question by 2015.

Information on public tenders for airport work throughout the country can be found at www.infraero.gov.br.



3 The Rio 2016 Olympic and Paralympic Games (cont'd)

3.3.2.6 Olympic Transport

Rio's Olympic Transportation strategy is based on a High Performance Transport Ring using the multimodal network to connect all four Games zones with critical city areas. A targeted Olympic Lane network will also be deployed along with other measures to ensure unimpeded access during the Games.

Transfer from the airport to the Games sites, Olympic and Paralympic Village and so on will be through dedicated car pool or coach systems for all members of the Games Family, via Olympic Lanes. For spectators, three new express bus links will operate using Olympic Lanes, and a new shuttle service will link the domestic airport with the adjacent metro station and to the southern hotel area.

Competition venues will only be accessible by public transport for spectators and travel on the day of the ticketed event will be provided for free. Rio will employ a state-of-the-art automated ticketing system for public transport to facilitate free spectator travel.

The Federal Government have made a commitment to open the skies for any company that intends to fly to Rio independent of existing bilateral agreements and granting permission for all charter and special Games-related flights to land in Rio.

Rio already operates an integrated Traffic Control management Centre (CTA) covering the entire city (transito.rio.rj.gov.br). The centre is currently being upgraded to increase its capacity (Table 22 in Annex 02). During the Games, a dedicated Olympic Traffic and Transport Division will deliver traffic and public transport operations. It will coordinate the planning of each of the existing Rio public transport providers, in cooperation with Rio 2016's transport directorate; lead the planning and delivery of traffic management and public transport services for spectators and Games workforce; collaborate with Rio's public transport providers, operators and relevant authorities; and take responsibility during operations for coordinating spectator and workforce transport systems, through a Traffic and Transport Coordination Centre.

Table 10 Transportation projects

Project	Permanent venues / projects			
	Investment USD millions	Source of funding	Start date	End date
Environment				
Rio International Airport Upgrade of the two runways to provide capacity to handle A380 aeroplanes, ongoing; Refurbishment of Terminals 1 and 2, ongoing; Replacement of 60 passenger lifts in both terminals during 2011; Construction of two parking areas with a total capacity of 6,000 vehicles by 2012; Construction of an additional 12,000 square metre logistics facility to increase freight capacity to 120,000 tons per year by 2014, ongoing; Construction of two satellite terminals, achieving a capacity of 25 million passengers per annum by 2014	483.35	-	-	-
Rio Ring Road at BR-493/RJ Paving of Segment C of Rio's Ring Road, 100km.	554.17	-	-	-
Ayrton Senna Avenue Upgrade to 12 lanes.	5.97	-	-	-
Abelardo Bueno Avenue Upgrade to 10 lanes.	17.90	-	-	-
Salvador Allende Avenue Upgrade to 10 lanes.	53.71	-	-	-

Table 10 Transportation projects

Project	Permanent venues / projects			
	Investment USD millions	Source of funding	Start date	End date
Environment				
Suburban Railways, new and renovated rolling stock Acquisition of 90 new air-conditioned trains, renovation of 94 existing trains, and upgrade of workshops in São Diogo and Deodoro.	1,121.85	SG	-	2011*
Belford Roxo urban train line, 28km Refurbishment of 14 stations and track renewal, catenary upgrade.	3 0.95	SG	-	-
Deodoro urban train line, 22km Refurbishment of 19 stations, new signalling, track renewal and catenary upgrade.	174.47	SG	-	-
Santa Cruz urban train line, 32km Refurbishment of 13 stations, track renewal and catenary upgrade.	42.21	SG	-	-
Saracuruna urban train line, 31km Refurbishment of 14 stations and track renewal.	33.77	SG	-	-
Metro Line 4 New line extending Line 1 to Barra, with six new stations: Nossa Senhora da Paz, Jardim de Alah, Parque Bossa Nova (Bartolomeu Mitre), Gávea (PUC), São Conrado and Jardim Oceânico. The line will extend to approximately 14km.	2,386.92	SG	-	-
Metro Line 1, upgrade and construction of Uruguai station Upgrade of the signalling and power supply systems, track renewal and construction of new station at Uruguai. Metro Line 1 is 16km long.	261.26	SG	-	-
Rolling stock for Lines 1 and 2 of the Rio Metro Acquisition of 144 new cars.	262.86	SG	-	-
Rolling stock for Line 4 of the Rio Metro Acquisition of rolling stock for line 4, and also monitoring, control and communication systems for the new line.	596.73	SG	-	-
BRT Transoeste The first BRT line to be implemented, work for Transoeste is already under way. It connects Barra da Tijuca to the western suburbs.	477.38	Mun	-	2013**
BRT Transcarioca Linking Barra da Tijuca to Penha to Galeao International Airport. Tender to be released imminently as of March 2011.	954.77	Mun	2011	2013**
BRT Transolímpico Running from Barra da Tijuca northwards to Deodoro and Avenida Brasil. A request for expressions of interest has already been made for a PPP that will include the construction of a tolled motorway with a BRT corridor in the median.	327.01	Mun	-	2013**
BRT Transbrasil Along Avenida Brasil, northern Rio's main trunk road.	-	Mun	-	2013**
Urban regeneration of the area surrounding Olympic Stadium The main roads around João Havelange Stadium will be widened. An overpass vaulting the railway will be part of the package for this area, allowing for better links to Barra da Tijuca.	47.74	Mun	2014	2014
Transport Total	7,833.0			

3 The Rio 2016 Olympic and Paralympic Games (cont'd)

3.3.3 Security

The city of Rio has fought an uphill struggle with drug traffickers and petty criminals for decades.

The city's geography and social disparities have contributed to a serious security situation that has been tackled head-on by the authorities with the creation of UPPs, pacifying police units located in problem communities.

The brainchild of José Mariano Beltrame, Rio State's Secretary of Security, UPPs have been credited with the significant reduction in serious crime experienced by the city since 2008, which resulted in real improvements in the quality of life of the previously blighted communities, property price hikes in liberated communities and the return of mass tourism to the city, making Beltrame something of a national hero in the process.

Table 11 Security projects. From EGP-RIO and Portal da Transparência

Project	Permanent venues / projects			
	Investment USD millions	Source of funding	Start date	End date
Environment				
Genesis Project Qualification of the State Police force	266.24	SG	2008	2011
Increase of Military Police officers From 38,000 to 54,000 by 2012	236.84	SG	2009	2012
Additional training and productivity measures for the State Police Including investigation techniques courses	22.11	SG	2009	2010
Pronasci scholarships Olympic scholarships for capacity building	13.98	SG	2008	2012
Criminal intelligence improvement (C3) Increase security by statistical analysis of crime trends, improvements to intelligence and procedures. CCTV programme for the entire metropolitan area of Rio de Janeiro.	12.34	SG	2008	2011
Projeto Cidade da Polícia Consolidation of special police operations	205.59	SG	2009	2010
Operational and administrative management of the State Police Improve operations by upgrading administrative and technical capability.	24.05	SG	2009	2010
Decentralisation of forensic police workstations	48.52	SG	2008	2009
Improvement of training procedures for the police force Specialist training for community engagement and conflict resolution	14.06	SG	2009	2011
Better visibility and improvements in crime prevention Create a high-visibility police force, with a presence on the bus network and increasing the number of police vehicles on patrol.	82.24	SG	2009	2011
Physical and mental well-being of the Military Police Programme aimed at reducing absenteeism due to mental illness in the police forces.	19.74	SG	2009	2016
Intensive training for the Military Police Specialist training in the following areas: - Tactical reaction. Integration of crime response with intelligence. - Create community police with conflict resolution training, as well as training to deal with vulnerable communities. - Spanish and English language lessons.	24.51	SG	2008	2016
Security Total	970.2			

The initiatives shown in Table 11 are ongoing, and form a comprehensive plan to improve police operations and professionalise the policing of these communities.

The State of Rio is tasked with security arrangements for the Olympics. Given the lack of experience in providing security for such an event, in spite of Rio Police's extraordinary experience in crime fighting, the State is engaged in a dialogue with London's ODA to exchange expertise. This is another area where the considerable experience of the UK's private sector security technology and services companies positions them well to win worthwhile business linked to the security requirements for Rio 2016.

3.4 Urban Regeneration

The regeneration of the Port area of Rio will be the largest urban legacy project of the 2016 Games. The port area, bounded by Praça Mauá, Avenida Presidente Vargas and Avenida Francisco Bicalho, the industrial and logistical heart of the city for 200 years, lost prominence with the advent of containerisation and the transfer of port activity to the new container port further up the Bay of Guanabara.

The port area has been suffering from general decay and neglect ever since. With about 1m sqm of underutilised land, 3m sqm of listed heritage sites and potential for the development of 5m sqm of floor area, the area is set to become a new magnet for investment in residential and commercial property, retail, entertainment and culture. Reversing the suburbanisation of Rio is in process and raising the resident population from the current 22,000 to 100,000. Tishman Speyer is already preparing to build a large office building at a cost of over US\$120m, and developers Sandria and CHL have plans to invest over US\$60m each.

The area is currently the subject of the country's largest PPP. The programme, named Porto Maravilha, is valued at US\$4.5bn, and is being delivered by a consortium formed by contractors OAS, Odebrecht and Carioca Christiani Nielsen. The consortium, named Porto Novo, is tasked not only with the construction of all infrastructure (sanitation, water, gas, power, street lighting, drainage and telecoms) but also with the provision of urban services, in concession, for 15 years. This includes lighting, street cleaning, waste collection and sewage disposal.

With a nod to such successful port area redevelopment initiatives as Puerto Madero in Buenos Aires and Barcelona's port, the project includes the undergrounding of a notoriously disruptive overpass (Viaduto Perimetral) effectively regaining access to the sea and the introduction of a tram network with the intention of constructing links to the rest of downtown Rio, including Santos Dumont domestic airport. The tram network is currently under study by Companhia de Concessões Rodoviárias (CCR) the winner of the public tender offered by the municipality for a viability study, including passenger demand and routing options (the end date for the study is August 2011).

The Porto Maravilha project also includes infrastructure and social improvements to three low-income neighbourhoods in the area, one of which, Morro da Conceição, dates from the 16th century.

The first stage of works, to run from April 2011 until 2015, will involve investment of US\$280m in essential urban improvements, namely the construction of 700 km of public networks for water supply, sanitation, drainage, electricity, gas and telecoms, 4 km of tunnels, 70 km of roads, 650 km² of pavements, 17 km of bike paths and the planting of 15,000 trees.

Funding for the infrastructure works will come from the sale of CEPACs, Additional Construction Potential Certificates available to investors interested in the area, released by the Company for the Urban Development of the Port Area, CDURP. The concept is loosely based on the ZAC developments in France in the 1970s. Acquisition of CEPACs, through public auction, will allow developers to build above current height limits (but below maxima defined by CDURP by area) thus increasing the return on their investment. Only public buildings and listed buildings/areas are excluded from the use of CEPACs. All income generated by the sale of CEPACs will be reinvested in the area, with 3% of the total earmarked for reinvestment in historic buildings. Just over 4m sqm will be offered through the sale of approximately 6.5m CEPACs, at a base price of R\$400/title (US\$240).

3 The Rio 2016 Olympic and Paralympic Games (cont'd)

To further incentivise investment in the area, municipal tax reductions are foreseen for developers.

More information about the project can be found at www.portomaravilhario.com.br

The city of Rio lobbied for the transfer of part of the Media Village to the Port of Rio de Janeiro. Convinced of the legacy benefits of building Olympic support facilities in this area of the city, the IOC agreed to the biggest departure from the commitments in the bid book and the Olympic Port competition was launched by the Municipality for the design of the

non-registered Media Village, the Referee Village, hotels and ancillary facilities (non-registered media centre, technology operation centre, main operation centre, main registry, registry and uniform distribution centre) in the port area. More information about the competition, whose winner remains to be announced at time of writing, can be found at www.concursosoportoolimpico.com.br

The areas and 10,600 rooms to be provided in the Olympic Port are spread over the following facilities: (see table 12 below).

Table 12 Olympic Port facilities

Building type	Units	Area (sqm)
Residential flats	5,000 flats minimum	285,000
Retail		20,000
Parking		140,000
4* hotel	200 rooms	7,500
Parking		500
Serviced flats	500 rooms	18,000
Parking		7,500
Commercial / hotel building	200 rooms	8,000
Parking		5,700
Business centre		45,000
Parking	-	19,000
5* hotel and convention centre	500 rooms	29,000
Hotel		40,000
Exhibition area		
Convention and service areas		15,000
Shared parking		54,000



3 The Rio 2016 Olympic and Paralympic Games (cont'd)

3.4.1 Morar Carioca

Morar Carioca is a programme for the integration of informal settlements carried out by the municipality. Its aim is to bring better housing, transport and services to a total of 625 communities in 1,020 informal settlements (favelas) by 2020, at an estimated cost of US\$4.7bn. The programme is part of the urban legacy set of projects for the 2016 Games, and has already benefited 54 communities throughout the city.

Where the regeneration of existing neighbourhoods implies the resettlement of residents, these will become beneficiaries of the Minha Casa Minha Vida federal social housing programme.

The programme was launched in July 2010. A national design competition was launched in November 2010 for the programme, resulting in the selection of 40 teams, among which the favelas will be split. The proposals addressed access and movement within the community, links to the public transport network, water and sanitation, improvements to the residential properties and sustainable use of utilities and natural resources.

Tendering for construction works is already under way for the neighbourhoods of Providência, in the Port area; Babilônia/Chapéu Mangueira, in Leme; Mangueira, in the northern suburbs; and Pedreira/Nova Jerusalém, in Costa Barros.

During the first phase of the project, which runs until 2012, an estimated US\$1.2bn will be spent, benefitting 140,000 homes.



Figure 12
The Olympic Port area

3.4.2 Maracanã and Deodoro Villages

An additional Olympic Village at Maracanã will not be realised anymore, as a result of the higher importance given to the Port of Rio.

A 1,224-room village in Deodoro was built by the Military for the 2011 CISM Military World Games. It will provide long-term accommodation for Defence personnel, as well as users of the National Shooting Centre during the Olympics.

3.5 Accommodation during the Games

Hosting the Olympics poses a challenge for Rio with regards to hotel capacity. By 2016 the city will need to build new hotels, improve the quality of existing properties and train or upgrade staff to an international level.

The legacy of this effort will be a more professional hotel offer in the city and two new residential neighbourhoods, in Barra da Tijuca and the Port of Rio. All accommodation, either in the form of villages or hotels, will be built privately. Additional bed-space will be provided temporarily by cruise ships moored in the Port.

Current hotel capacity in Rio is approximately 25,000 rooms. An additional 9,000 are in the pipeline, all complying with the International Paralympic Committee's accessibility standards, which stipulate that at least 5% of accommodation is accessible. The overall objective is to achieve a minimum of 1% accessible rooms across the city. Total hotel capacity will add up to 34,000 rooms.



Figure 13

Rio Olympic Village, Barra da Tijuca, EGP-RIO

3 The Rio 2016 Olympic and Paralympic Games (cont'd)

Construction of the Olympic and Paralympic Village started in December 2010. The 75ha green field site is owned by Carvalho Hosken (CH), a Rio contractor and developer with large land holdings in Barra da Tijuca. CH, RJZ Cyrela and Raiar Engenharia, an engineering firm, will deliver the project, which will consist of 48 12-storey residential towers set in 58ha of the site, totalling over 2,800 three and four bedroom flats providing accommodation for 17,700 athletes, as well as 1,000 parking spaces.

In legacy mode the Village will become a residential community based on the model deployed for the 2007 Pan American Games. Feasibility studies have shown that there is high demand for medium to high end residential property in the Barra area, particularly as this is where much of the new development in Rio is taking place. The financing of the Village project is fully guaranteed by Caixa Econômica Federal (CEF), the federal government-owned savings bank. This will follow the same financing structure implemented for the 2007 Pan American Games Village, with CEF guaranteeing the availability of all necessary funds to the developer at preferential rates of interest. Estimated costs of the project are around US\$510m, with work due to be completed in 2015. The partnership model between the Federal Government and the developer eliminates risks, which could otherwise delay development. Apartments will be offered for sale prior to the Games and will undergo a soft refurbishment after the Games.

All temporary works which are required on the Village will be delivered and financed through Rio 2016. It is expected that these will amount to US\$140m. Temporary works will begin in 2015, finishing ahead the Games in 2016. Rio 2016 will rent the Olympic and Paralympic Village from the developer for the duration of the Games, at a capped cost of US\$18.9m.

The government has offered a range of additional incentives to support the project including:

- Fast tracking of approvals through the City Planning Department
- Additional development permits within the framework of the city zoning legislation and Environmental Impact Study
- The immediate implementation of planned roads, utilities and environmental remediation surrounding the Village site
- Preferential interest rates for buyers

The Village design will meet or exceed IOC/IPC requirements and representatives from the National Olympic Committees (NOCs) and National Paralympic Committees (NPCs) will participate in a formal advisory group to the development. The apartments will be fully adaptable for use during both Olympic and Paralympic Games and will not need to be reconfigured in legacy mode. Sustainability will be incorporated as a fundamental design element of the Village.

The focal point of the Village, within the Residential Zone, will be 'Rua Carioca', a pedestrian street with cafés, restaurants, shops and recreation areas. A Transport Mall, incorporating 45 bus bays, will be created to manage athlete and team transportation to and from venues. The International Zone will house most of the commercial activities as well as the Media Centre and a 'Welcome Ceremony Plaza'. An Operational Zone of 13 hectares will incorporate all logistics, catering, housekeeping, cleaning, waste and Village management services.

The Olympic Village Training Centre will provide training areas for 11 Olympic sports and 8 Paralympic sports. It will be located adjacent to the Village, within walking distance. Additionally a secure bridge will link the Village with the Olympic Village Park, which will provide recreational facilities such as tennis and beach volleyball courts, football fields, and windsurfing and kayaking.

The timeline for construction anticipates a handover of the Village to Rio 2016 in January 2016 with all permanent works complete. Major temporary works will have already begun in parallel, and construction of the International Zone and temporary elements of the Residential Zone will commence in August 2015. Table 20 in Annex O2 shows the construction timeline given in the Rio bid book.



An Environmental Impact Assessment (EIA) has been undertaken for the site and outlines measures to be taken as part of the development. This includes the remediation of the Lake Jacarepaguá, and other waterways and natural features within the site. In addition the developer has committed to implementing the following environmental initiatives:

- Sustainable design and construction concepts in accordance with international best practice
- Direct connection to the new Bus Rapid Transit (BRT) system, improving access and mobility for residents in the long term and reducing carbon emissions
- Development of optimal 'green space' within the site to promote healthy lifestyles

The Project Control Group, including Rio 2016, Government authorities and the developer will monitor the project to ensure compliance with these initiatives and all recommendations from the EIA. The Olympic and Paralympic Village will also offer shopping areas, restaurants and entertainment.

The Barra Media Village, another private development, is currently scheduled to offer between 5,000 and 7,000 rooms. With the creation of the non-registered Media Village in the Port of Rio, the exact setup of the Barra Media Village is still to be determined.

In addition to the permanent accommodation to be available in the Port and in hotels throughout the city, approximately 8,600 rooms will also be provided by cruise ships moored in the port.

The estimated total number of rooms that will be available in 2016 is shown in Table 13.

Table 13 Estimated accommodation capacity in 2016

Status	Available for Olympics	Source
Hotel Existing	12,500	ABIH
Hotel Planned	4,500	ABIH
Cruise ships	8,580	From bid book
Port area (non-hotel)	9,200	Olympic Port competition TOR
Barra Media Village	6,000	Rio 2016
Deodoro Village	1,224	Rio 2016
Olympic Village	8,856	Rio 2016
Total	50,860	

The known numbers of rooms currently submitted for planning approval or under construction is:

Table 14 Hotel rooms under construction, Rio Negócios

Hotel rooms under construction		Where
Accor	2,200	Barra, Copacabana, Botafogo, Del Castilho
Windsor	1,240	Barra, Catete, Copacabana
Hyatt	408	Barra
Atlantica	352	Barra, Copacabana
BHG	112	Copacabana
Total	4,312	

Table 15 Investment in villages and urban renewal

Project	Permanent venues / projects		Temporary venues					
	Investment USD millions	Source of funding	Start date	End date	Investment USD millions	Source of funding	Start date	End date
Urban legacy & villages								
Olympic and Paralympic Village	509.68	Private	2012	2015	140.00	Rio 2016	2015	2016
Olympic Port	-	Private	2011	-	-	-	-	-
Porto Maravilha	4,500.00	Mun/PPP	2010	2025	-	-	-	-
Morar Carioca	4,773.84	Mun/FG	2010	2020	-	-	-	-
Urban Regeneration of Rio das Pedras (Rio das Pedras PAC)	229.95	SG	-	-	-	-	-	-
Urban regeneration, residential and mobility programme for the integration of the community with the rest of the city. - 2,200 new residential units - Upgrade of all basic infrastructure, including water, sewage, drainage and lighting. - Creation of a new Cidade do Forró (a type of music) - Creation of a cultural tourist and gastro cluster for job generation within the community.								
Urban Regeneration of Mangueira (Mangueira PAC)	89.51	SG	-	-	-	-	-	-
Urban regeneration, residential and mobility programme for the integration of the community with the rest of the city. - 1,200 new residential units to resettle families now living in substandard accommodation or high-risk areas - Improvements to road network and regeneration of Visconde Niterói Avenue - Upgrade of all basic infrastructure, including water, sewage, drainage and lighting. - Creation of Mangueira community centre, with a health centre, a youth centre, a job centre and a legal-support centre. - Creation of Mangueira cultural cluster - Creation of tourist route around Mangueira.								
Urban Regeneration of Cidade de Deus (Cidade de Deus PAC)	229.09	SG	-	-	-	-	-	-
Urban regeneration, residential and mobility programme for the integration of the community with the rest of the city.								
Urban Regeneration of Tijuca (Tijuca PAC)	421.17	SG	-	-	-	-	-	-
Urban regeneration, residential and mobility programme for the integration of the community with the rest of the city. - 2,800 new residential units to resettle families now living in substandard accommodation or high-risk areas - Improvements to road network, including the creation of bike lanes - Upgrade of all basic infrastructure, including water, sewage, drainage and lighting. - New vertical access links to four hillside unplanned settlements: Complexo do Turano, Morro do Saquinho, Morro da Formiga and Complexo do Borel - Casa Branca.								
Legacy Total	10,753.20				140.00			

Ongoing PAC investments in urban regeneration in Mangueira, Cidade de Deus and Tijuca have also been set up so that they will be ready for the Olympic Games.

4 The construction sector

4 The construction sector

4.1 Overview

The role of the construction industry in the GDP growth of Brazil, forecast at around 5% PA over the next few years, is pivotal, since the country needs roads, railways, ports, airports and waterways, as well as large amounts of housing for its development. Investing in construction also reinforces the development cycle, so a dynamic construction sector is both a promoter and a result of a buoyant economy.

In order to maintain the high growth rates, Sinduscon, Brazil's Syndicate of Construction Industries, estimate that the construction sector needs to grow at an average of 6% PA over the coming years. This would require improvements to industrial policy and the way the industry operates, starting with a process of simplification of bureaucracy, which is essential to speed up business practice and planning approvals. Brazil is in 127th position in the World Bank's ease of doing business ranking. It also ranks low in the categories of Opening a Business, Paying Taxes, and Closing a Business, among other crucial indicators¹⁷. Brazilians are familiar with the implications of "Custo Brasil", freely translated as "the Brazil mark-up". This needs to be factored in when doing business. Electronic licensing, invoicing, company and property registration and tax payment are slowly making progress and breaking the pattern of paper-based transactions, adding transparency to business and commercial practice by reducing the opportunity for corruption. Nonetheless poor infrastructure in the form of clogged ports, choked airports and gridlocked roads will continue to impact on companies' competitiveness.

This is compounded by an overvalued Real, which has tipped the scales in favour of imports, to the detriment of Brazilian industry. As with other sectors, the construction materials sector is not capable of competing internationally, and foreign products are taking a growing share of the market. High interest rates, the high cost of energy and the tax burden further undermine competitiveness in a country that is a leading commodity supplier, so any strategy for the promotion of competitiveness needs to focus primarily on reducing the internal cost of producing and doing business in the country, as well as improving training and education.

Brazil suffers from a shortage of well-qualified professionals. Traditionally, the focus of education efforts has been basic schooling, with little money being invested in education at O- and A-level (equivalents) and universities. This has led to the proliferation of cheap but often poor private universities. So while there are many formally educated people, the quality of their education remains low. Graduates are not well prepared to meet the challenges of a booming construction industry, which will face serious bottlenecks if productivity levels do not rise.

With severe workforce shortages already being felt at all levels, industrialisation of building methods is inevitable. More machinery and specialised equipment will be needed throughout the sector to bring down delivery costs and break the cycle of low qualification and low wages. Back at the office, engineers and project managers now feel the pinch of a culture of little public investment in recent decades. This left the country with vast under-maintained and under-performing infrastructure assets, little capacity to deliver new work, and a recent pool of graduates who, even when well trained, have little practical experience but are taking up senior roles earlier and earlier in their careers.

Wages in the sector have been steadily rising across the board, as a reflection of growing demand. When large construction programmes like the World Cup and the Olympics, which are national priorities, start absorbing workers en masse, the remainder of the sector will not be able to compete without doing more with less and offering higher salaries to attract talent. Only an overhaul of building and planning methods will allow that. Early birds like developer Gafisa have set up a Building Information Modelling (BIM) office, in anticipation of an over-heated market where fast turnover of work and little available manpower on site will stretch the company's resources to the limit. A little-known technology in Brazil until not long ago, BIM is now becoming more widespread, not least due to aggressive marketing by companies like Revit, Bentley, ArchiCAD and Vector.



If things do not look rosy on the infrastructure side, a traditionally weak planning profession, coupled with the absence of urban policy enforcement and a serious housing deficit, has led to a social and environmental urban catastrophe that is now being tackled by the construction of government-funded social housing, aimed at the lower middle classes, mainly through Minha Casa Minha Vida. The total housing needs of the country, social and otherwise, are estimated at 24m units by 2022 (Sinduscon). The sheer volume of construction puts pressure on municipalities to deliver the services that such development will demand but the capacity of most local authorities to undertake or commission masterplans and manage the complexity of infrastructure work that is needed is low. This has become apparent with the difficulty encountered by certain municipalities in spending PAC funds. The reversal of Brazilian cities' trend to sprawl indefinitely is paramount, as the costs and environmental impact of ever-growing cities become apparent and shortcomings in transportation and other services become hot political topics. Regeneration and consolidation of urban areas is now more common, with trail-blazing projects like Porto Maravilha in Rio de Janeiro and Nova Luz in São Paulo changing the current paradigm of urban development.

Urban re-development is not necessarily without controversy. Brownfield developments in particular raise issues pertaining to the responsibility for land de-contamination. According to resolution 420/09 of Conama, the National Environment Council, responsibility for decontamination of land may lie with the current owner, regardless of their involvement in the actual contamination of the land. The passing of legislation regulating solid waste disposal in 2010 complements soil-contamination legislation and further cements the legal environment for an emerging industry, which is set to grow, given the scale of new waste-disposal plants and the remedial work that will need to be undertaken in landfill sites throughout Brazil.

4.2 Public tenders

Public procurement of construction works in Brazil is regulated by Law 8,666 of June 21st 1993 and its subsequent amendments. Its 126 articles specify the conditions for participating in public tenders at all government levels, with the main aim to guarantee fair participation to all bidders in the public interest.

The six stages of the process of public commissioning are as follows:

- 1 Publication of notices containing the regulations to be followed by all participants, including qualification requirements to be met, desired capability and experience, and the objective of the tender
- 2 Technical and legal qualification of participants (which may include the registration of an expression of interest with the awarding entity or a site visit, for instance)
- 3 Evaluation of technical proposals
- 4 Evaluation of financial proposals
- 5 Final selection and approval
- 6 Signature of the contract

The main criticism within the design community to Law 8,666 is that by allowing public contracting for construction work at concept design stage, the law encourages very inaccurate budgeting. This is helped by the absence of the profession of independent quantity surveyors - surveyors are usually part of the contractor's staff. This market distortion further strengthens the position of contractors, who will typically lead projects and subcontract detailed design to architects and engineers, who end up having little negotiating power and influence over the quality of the final product.

A crucial recent amendment to Law 8,666 was passed in December 2010, regulating the participation of foreign firms in public tenders. Law 12,349 of December 15th 2010 stipulates public clients' freedom to impose preferential conditions for Brazilian firms participating in public tenders, based on criteria of:

- 1 Employment and wealth generation
- 2 Federal, state and municipal tax revenue
- 3 National development and technical innovation
- 4 Additional cost of products and services

4 The construction sector (continued)

Preferential treatment may be awarded to Brazilian firms up to a total of 25% of total value of the object of the tender, in detriment of foreign goods and services. The exact percentage will be defined by the Federal Government, and may or may not be extended to firms originating from Mercosur (the customs union of Brazil, Argentina, Paraguay and Uruguay).

The amendment is controversial even within Brazil, where fears were raised with regards to the potential danger of hampering the entrance of innovative technology into the Brazilian market.¹⁸

Tendering for public projects in Brazil involves dealing with a large amount of bureaucracy. While this is no different in principle from public tenders in the UK, the nature of some documents will be unfamiliar to British companies. Association between Brazilian and foreign companies is foreseen in tendering law, requiring that the leadership be vested in the Brazilian partner. Any one firm, regardless of their position in a consortium, can only bid for each tender once (leading one team while being a minor partner in another, for instance, will result in the exclusion of both teams from the tender). Consortia will need to be formally registered with a notary, and foreign firms will generally be required to submit documentary proof evidencing legal, technical, economic and financial eligibility, as well as good standing with the relevant tax authorities. A waiver of such requirements is possible in cases of invitation to bid, for instance but companies must in any case have at least a legal representative in the country with express powers to receive service of process.

Foreign firms are expected to meet the same requirements and submit equivalent documentation to that of Brazilian firms. Documents will need to be translated by a sworn public translator (tradutor juramentado in Portuguese), and certified at a Brazilian Embassy or Consulate in the home country. Typically required documents are proof of solvency, social contract (the net worth of a company), proof of turnover, tax payer registration, proof of corporate tax payment and even 'negative certificates', proving that one is **not** in debt with the taxpayer or **not** insolvent.

Where pre-qualification requires proof of experience in projects of a similar nature to the object of the tender, a company's registered body of experience (Acervo Técnico) is of paramount importance. Acervo Técnico is a set of documents, named Certidões de Acervo Técnico (CAT), all duly registered with and guarded by Regional Architecture and Engineering Councils (CREA), attesting to a company's portfolio.

Relevant company experience is converted into a CAT document for each project, indicating the project's main features, like date of start and end of works, name of client, names of relevant professionals involved, location, square meterage, user capacity, technical specifications of the service or job and table of quantities, as well as any other information that may be deemed relevant. This is then registered with CREA, which supplies it to the contracting authority upon request. Foreign companies will not be exempt from the requirements of a relevant Acervo Técnico to participate in public tenders. Documents equivalent to Brazilian CATs will still be required, will need to be translated by a certified translator and formalised by the Brazilian Embassy or Consulate of their home country. Depending on the relevant CREA chapter, foreign documents may need to be submitted in advance of the tender, to allow the organisation to register the documents and provide the applicant with the necessary certificate for the tender. This may add a degree of difficulty when tender deadlines are tight.

The creation of an Acervo Técnico is an important enough part of a company's operations to justify the hiring of specialists tasked exclusively with its creation. It is highly advisable that companies that plan to bid for Brazilian public works make themselves familiar with the concept and seek legal advice before attempting to compete in the Brazilian market.



The tendering process for Olympic projects that are funded with public money will be managed by the APO or its delivery partner, in accordance with the relevant legislation for procurement (at federal, state or city level, as appropriate). Tenders will be open to domestic and international companies that meet all legal and technical criteria. These will include sustainability criteria that will be included in order to meet the commitments made in the bid book. Where required, tenders for construction will be preceded by international design competitions. The Olympic Park competition, launched in May 2011, will set the standard for other projects to follow. The three types of contracts expected to emerge from each separate package will include:

- 1 Design competition
- 2 Tender for construction
- 3 Tender for project management.

In anticipation of delays with World Cup and Olympic projects, Congress approved a Budget Directive Law that reserves the right to waive Law 8,666's requirements for environmental licensing and compulsory purchase. In extremis, the directive may allow the suspension of Law 8,666 and the direct commissioning of works. The Tribunal de Contas da União (TCU), the equivalent to the National Audit Office, still retains jurisdiction over the process, however, which can only be initiated by direct congressional order. This prerogative has not been used as of March 2011.

Relevant legislation for government tenders, contracts and acquisitions can be found in <http://www4.planalto.gov.br/legislacao/legislacao-por-assunto/licitacoes-contratos-e-compras-do-governo-teste#content>

4.2.1 Foreign investment

A foreign company wishing to do business in Brazil will need to make a decision as to the format of its investment and degree of involvement in the market. The following options will present themselves:

- 1 To open a Brazilian subsidiary
- 2 To acquire a stake in an existing Brazilian company

When opening a Brazilian subsidiary, companies have the option of a limited liability company (sociedade limitada) or a stock corporation (sociedade anônima). Both structures require two or more partners. When these do not reside in Brazil, the appointment of an attorney-in-fact to receive service of process becomes mandatory. The partners' liability is usually limited to their contribution to the capital in the case of a corporation, or the full payment of the entire capital in the case of a limited liability company. The average time to open a company in Brazil is estimated by the World Bank at 120 days.

Acquiring an existing Brazilian company involves a registered change to the articles of association of the existing company, effectively either buying out the existing partners or increasing the company's capital to the degree that the foreign company becomes the majority quotaholder. Substantive executive decisions, like the increase of the company's capital, or changes to the articles of association, require the agreement of the owners of at least 75% of the quotas, so a company wishing to control a limited liability company must acquire at least 75% of its quotas. In the case of stock corporations, an absolute majority (50% plus one) is needed to approve most decisions at shareholders' meetings, so the majority stakeholder effectively exerts control of the corporation.

Selling services or consultancy to Brazilian companies implies the setup of a legal entity which requires at least the appointment of a local attorney-in-fact. The repatriation of fees will be subject to a minimum 15% withholding tax.

It is absolutely essential that companies seek legal advice to discuss business plans in Brazil in advance of entering any agreement or committing to any business proposals. Legal and accounting due diligence reviews should include the scrutiny of a Brazilian company's labour liabilities in particular, since these will become the responsibility of the acquirer.

Additional information on the main taxes in Brazil can be found in Annex 02 Contractors and Engineers

The tables overleaf are sourced from "O Empreiteiro" magazine, July 2010.

Table 16 Brazil's 50 largest contractors

Ranking 2010	Company	State	Gross revenue US\$ x 1,000	% of revenue from government*	% of revenue from private sector*	% of revenue from real estate projects*	Activity
1	Norberto Odebrecht	RJ	2,649,378	62	38	-	ABCDEFGHIJKMNO
2	Camargo Corrêa	SP	2,635,628	35	65	-	ABCDEFHIJKLMNO
3	Andrade Gutierrez	MG	2,094,011	72	28	-	ABCDEFHIJKLMNOTU
4	Queiroz Galvão	RJ	2,020,292	100	-	-	ABCDEFGHIJKMNO
5	OAS	SP	1,307,759	59	41	-	ABCDEFHIJKMNO
6	Galvão Engenharia	SP	1,065,653	51	49	-	ABCDEIJK
7	Delta Construções	RJ	1,056,000	-	-	-	ABCJJO
8	Mendes Júnior Trading	MG	690,703	80	20	-	ABCDEFGHIJKMNO
9	Gafisa	SP	614,718	-	-	100	PQRSUV
10	Carioca Christian-Nielsen	RJ	601,585	50	50	-	ABCDEFHIJKMO
11	Construcap CCPS¹	SP	547,960	50	50	-	ABCDEFHIJKLMNOQR
12	EIT - Empresa Industrial Técnica	CE	472,150	70	30	-	ABCDEFHIJKMOP
13	MRV Engenharia	MG	457,619	-	-	-	PQRS
14	Egesa Engenharia	MG	403,039	87	13	-	ABEIJKNO
15	Construtora Tenda	MG	376,491	-	-	-	PQRS
16	Tecnisa Engenharia	SP	369,045	-	-	-	PQRSV
17	WTorre¹	SP	351,521	-	100	-	DPQRSTUV
18	Serveng-Civilsan	SP	340,887	77	23	-	ABCDEFHIJKMNO
19	Método Engenharia¹	SP	331,601	-	100	-	PQRSTUV
20	ICEC	SP	309,678	-	100	-	DHIJKMPQRSTUV
21	Santa Bárbara	MG	309,387	55	45	-	AOPQRT
22	Barbosa Mello	MG	305,270	70	30	-	ABCEIJKMNO
23	Schahin Engenharia	SP	294,902	42	58	-	BLNOPQRSTUV
24	Via Engenharia	DF	293,343	53	8	39	ACJUMO
25	Trisul	SP	291,686	-	100	-	PQRS
26	Rossi Residencial	SP	269,649	-	-	100	RS
27	C.R. Almeida Engenharia de Obras	PR	261,174	95	5	-	ABCDEIJKMO
28	Fidens Engenharia	MG	241,199	84	16	-	ABCEIJO
29	Azevedo & Travassos	SP	224,356	-	100	-	ABCEIJKMO
30	S. A. Paulista	SP	220,677	100	-	-	ABCDEIJO
31	Toniolo, Busnello	RS	207,881	28	72	-	ABCEIJKMO
32	Construtora Artepa	MG	197,942	100	-	-	ABEIJOPQSU
33	Direcional Engenharia	MG	195,545	4	1	95	PQ
34	U&M Mineração e Construção	MG	187,943	-	100	-	ABDEJO
35	Mascarenhas Barbosa Roscoe¹	MG	183,710	-	100	-	ABHIOQTU
36	Company	SP	182,261	-	-	-	PQRSUV
37	ARG	MG	175,289	30	70	-	ABCDEFHIJKOPQRST
38	EMSA	GO	165,136	96	4	-	ABCDEFHIJKMNO
39	Construtora Triunfo	SP	146,095	-	-	-	ABCDEFHIJKO
40	Construtora Cowan	MG	142,221	83	17	-	ABCDEFHIJKMO
41	Grupo Thá	PR	140,424	-	-	-	AIJOPQRSTUV
42	Gomes Lourenço	SP	134,459	70	30	-	ABCIMNOPT
43	Leão Engenharia	SP	132,404	25	75	-	ABIJO
44	Paranasa Engenharia	MG	131,705	-	100	-	CDHIJNOPQRSTUV
45	Racional Engenharia¹	SP	129,250	4	96	-	ABCDEFHIJKOPQRSTU
46	Marquise	CE	125,757	98	-	2	PQRSV
47	Construtora Sucesso	PI	124,600	-	-	-	AINOPQSU
48	Constran	SP	117,900	100	-	-	ABCDEFHIJKMNO
49	J. Malucelli Construtora	PR	116,613	75	25	-	ABCO
50	Camter	MG	113,303	94	6	-	ABEIJNOST

Table 16 Key

A	Highways
B	Hydroelectric Plants/Dams
C	Tunnels
D	Ports
E	Railways
F	Nuclear Power Plants
G	Offshore Platforms
H	Petroleum and Petrochemical Plant
I	Bridges & Viaducts
J	Airports
K	Pipelines
L	Telecommunications
M	Subway
N	Power Transmission Lines
O	Water & Sewerage
P	Residential Buildings
Q	Office Buildings
R	Horizontal Condos
S	Real Estate Projects
T	Industrial Plants
U	Shopping Malls
V	Hotels

Table 17 Key

A	Highways	L	Pipelines
B	Hydroelectric Plants/Dams	M	Telecommunications
C	Power Transmission Lines	N	Subway
D	Water & Sewerage	O	Shopping Malls
E	Ports	P	Steel mills
F	Railways	Q	Industrial Facilities Projects
G	Nuclear Power Plants	R	Construction Management
H	Offshore Platforms	S	Feasibility studies
I	Petroleum and Petrochemical Plant	T	Architecture Design
J	Bridges & Viaducts	U	Urban Planning Airports
K	Airports		

Table 17 Brazil's 15 largest engineering companies

Ranking 2010	Company	State	Gross revenue x 1,000BRL	Gross revenue US\$ x 1,000	% revenue from engineering	% revenue from construction management	% revenue from architecture design	% revenue from other activities	Employees	Activity
1	Engenix Engenharia	SP	1,467,309	734,543	11	10	-	79	2,630	ABCDEFGHUKLMNORSTU
2	Promon Engenharia	SP	607,728	304,232	30	20	-	50	844	BCDEFGHIKLMNOPRSU
3	Concremat Engenharia	RJ	532,477	266,561	29	46	4	21	2,976	ABCDGFIJLMNOPQ
4	Ciec Engenharia	SP	373,292	186,872	90	10	-	-	590	ABCDEFHUKLMNORSTU
5	Technip Brasil	RJ	270,912	135,620	10	90	-	-	1,054	ABCDEFHUKLMNORSTU
6	Logos Engenharia	SP	250,201	125,252	71	71	-	29	870	ABDEFGIJKLMNORS
7	Tecnosolo	RJ	181,057	90,638	27	36	3	34	1,049	ABDEFJKLNPORSTU
8	Mineronsult Engenharia	MG	178,982	89,599	80	20	-	-	926	CDEEIPORST
9	Progen -Projetos e Gerenciamento	SP	171,155	88,685	73	27	-	-	1,600	HIMPORS
10	Leme Engenharia	MG	174,588	87,400	40	60	-	-	821	BCDGKQRS
11	Projectus	SP	139,634	69,901	75	25	-	-	800	ABCDEFHUKLMNORSTU
12	Genpro Engenharia	SP	126,247	63,200	75	20	5	-	673	EHIIPORST
13	ATP	PE	116,701	58,421	-	-	-	-	-	-
14	Duetor	SP	106,832	53,481	5	85	-	10	800	ADFIJNR
15	EPC Engenharia	MG	102,748	51,436	59	40	-	1	1,050	BCDEFJLNORST

4 The construction sector (continued)

4.3 Certification programmes

Sustainability concerns are slowly creeping up the agenda in Brazil. To the strict environmental and forestry laws already in place for years, new legislation for land contamination and solid waste disposal have recently been added and programmes for energy efficiency, like PROCEL, are becoming more common. Equally, demand for building certification has been increasing steadily, in spite of the cynicism of some in the construction industry, who regard this interest in certification as an infatuation with the latest fashion. Critics will point out that there is little understanding of the life-cycle of buildings, an exaggerated focus on the single building and a reliance on imported certification labels (i.e. LEED) that are not necessarily the most appropriate for the Brazilian reality. Due to the work of bodies like the Brazilian Centre for Sustainable Construction (CBCS), the Vanzolini Foundation and the work of designers like Lelé and Siegbert Zanettini, awareness of the pivotal role of sustainability in the shaping of a new construction industry is increasing. This is likely to be further boosted when the sustainability demands for the Olympics start percolating through the industry.

The most widespread certification currently in use in Brazil is the US Green Building Council's LEED. LEED Core and Shell tops the list of LEED-certified projects, closely followed by LEED New Construction. São Paulo is well ahead of the rest of the country, with about two thirds of all the certified buildings in the country and also the largest pool of accredited professionals (52), followed by Rio Grande do Sul, with seven accredited professionals, and Rio de Janeiro, with four as of September 2010.

Requests for certification started with one in 2004 and quickly grew to 62 in 2009. The total number of certified buildings in the country now stands at 210. In the face of this extraordinary growth in demand for certification, Brazil's chapter of the Green Building Council estimates strong growth in the sector until at least 2020.

Brazil's own main certification programmes are Aqua and PBQP-H (Minha Casa Minha Vida). Aqua, which stands for Alta Qualidade Ambiental (Portuguese for high environmental quality) is based on the French certification HQE (Haute Qualité Environnementale), adapted to the Brazilian context by the Vanzolini Foundation. Aqua, was launched in 2008 and it uses 14 sustainability criteria over four project streams: eco-build; eco-management; comfort and health, covering the design, construction and post-occupancy stages of a project. It has been used for the certification of commercial and social housing, offices, sports buildings and hospitals.

The Aqua certification process involves the use of a project management system designed for the purpose, which includes regular site visits by accredited certifiers and partial approvals at each stage: programme, design, construction and operation. Certifiers are trained to evaluate parameters by region, climate zone and native planting, among others.

Aqua certificates for neighbourhoods and roads are being developed currently. More information can be found at www.processoaqua.com.br



PBQP-H is the Portuguese acronym for Brazilian Programme for Quality and Productivity in the Construction Sector. It is aimed at the improvement of business practices and capacity-building within the entire supply chain of the construction industry, for the purpose of delivery of social housing to reduce Brazil's housing deficit. The programme is owned by the Ministry of Cities' National Housing Secretariat. It is not an environmental certification programme as such, but some of the criteria for entry include sustainable parameters.

Participation in PBQP-H is voluntary and open to all stakeholders in the social housing industry, from suppliers to contractors and government housing agencies. Participants have preferential access to social housing tenders, provided that they reach certain milestones within their organisations, defined by a system for the qualification of companies and services provided by the programme which includes:

- Production of higher-quality construction materials
- Qualification of labourers
- Standardisation of building practices
- Improvements to R&D facilities
- Use of new technology
- Improved communications.

The ultimate aim of the programme is to streamline social housing delivery, by improving quality and reducing government expenditure.



4.4 Contractors

The construction industry in Brazil pivots around the contractors. While contractors of all sizes and levels of competence abound all over the country, only a few names are likely to be found in connection with any large project. The World Cup in 2014 is no exception and it is expected that the 2016 Games will not be either. This quasi-oligarchy has an unmatched grip on the market that comes from well-nurtured relationships with all levels of government, sharp business acumen, outstanding flexibility and adaptability and above all a reputation for excellence that is the envy of other industries and the public sector.

Some Brazilian contractors are multinationals, and are well established beyond Brazil's borders. Portugal and Portuguese-speaking Africa are natural extensions to the Brazilian market but the major contractors are also present in Latin America, the United States and the Middle East.

While some contractors have dedicated engineering teams, it is common to subcontract consultants and designers. This practice is a consequence of the current tendering law, whereby projects are commissioned at concept design stage.

The five largest contractors in Brazil are Odebrecht, Andrade Gutierrez, Queiroz Galvão, Camargo Correa and OAS. The first two each employ in excess of 100,000 people worldwide. Mendes Junior, Carioca Christiani Nielsen and Delta are well-known contractors of a different scale.

Consortia between the largest contractors are common, as can be appreciated in Table 18 (page 78) where the consortia delivering the FIFA World Cup 2014 stadia are explained. This means that it should not be assumed that one company is another's competitor and resources will be pooled if an opportunity for a project is identified.

The largest contractors run diversified operations that range from the construction of infrastructure and industrial or extractive plant to the operation of assets in concession. With the market for PPPs growing in the country and the formalisation of sectors previously operating in semi-irregularity, like sanitation and waste disposal, more and more of these assets are being built, maintained and operated by dedicated companies or consortia that either emerge from within or have been acquired by the largest contractors. With the announced privatisation of airports a similar level of contractor involvement is expected.

4 The construction sector (continued)

Some of the main Brazilian contractors are:

Odebrecht

Founded originally as a contractor in 1923, the Odebrecht group has grown in the intervening 80 years to one of Brazil's largest companies, the country's biggest contractor, and an unavoidable reference in the construction business in Brazil. The group is controlled by the founding family, Odebrecht, with the Gradin family as a minority partner. About 120,000 people are directly employed by the group.

The company's interests and size eventually required the establishment of a holding company in 1981, Odebrecht SA, with operations in Europe, Africa, North America and Asia, and a significant presence in Latin America.

Odebrecht is currently delivering three stadia for the FIFA World Cup 2014, as well as a host of significant infrastructure projects throughout Brazil. In Rio, Odebrecht's current portfolio of works includes Line 4 of the Rio Metro (in consortium with Queiroz Galvão, Cowan, Carioca Christiani Nielsen and Servix) and also the infrastructure and concession for utilities and maintenance of the port of Rio, part of the Porto Maravilha project, in consortium with OAS and Carioca Christiani Nielsen.

www.odebrecht.com

Camargo Corrêa

A private group founded in 1939 in the State of São Paulo and still under family control, Camargo Corrêa employs more than 58,000 people in 18 countries.

The company's main businesses are: cement, energy concessions, highway concessions and construction but its portfolio of expertise includes rail concessions, steel mills, environmental services, shipbuilding, oil and gas, airport operations and development.

Camargo Corrêa is the owner of the Havaianas flip-flop brand, arguably Brazil's most famous - and stylish - footwear.

www.camargocorrea.com.br

Andrade Gutiérrez

The Andrade Gutierrez Group was founded in Belo Horizonte in 1948. It is one of the largest private groups in Latin America, with operations in engineering and construction, telecommunications, power, and public concessions. It employs approximately 150,000 people in Brazil, Latin America, Europe, Asia, and Africa.

The company is very active in all areas of infrastructure, including the oil and gas industry, and has been operating concessions since the 1990s.

Andrade Gutierrez is involved in the construction of three World Cup stadia, in Manaus, Brasília and Rio de Janeiro (as the junior partner of the consortium formed by Odebrecht and Delta for the refurbishment of Maracanã stadium) and has the ambition of leaving a lasting urban legacy in those cities.

www.andradegutierrez.com.br

Queiroz Galvão

Queiroz Galvão has been in the market for nearly six decades, and currently employs about 30,000 people across 50 companies, in sectors such as construction, real estate development, food, investments and concessions, oil and gas, iron and steel and environmental engineering.

The group is present in the whole of Latin America and also in Africa, including Libya, where the company builds infrastructure.

For the World Cup 2014, Queiroz Galvão is delivering Fortaleza stadium, a R\$452m project, in consortium with Serveng and BWA.

portal.queirozgalvao.com

OAS

Founded in 1976 as a contractor, OAS grew to become one of Brazil's five top contractors, and is present in 15 South and Central American countries, as well as in the Caribbean and Africa.

Some of OAS's projects are, among many others, Rio's João Havelange Olympic Stadium (or Engenhão), built for the 2007 Pan-American Games; the Octavio Frias de Oliveira suspension bridge, in São Paulo; the upgrade of REVAP Refinery in São José dos Campos, São Paulo; the Chemical Gas Complex of Rio Polímeros, in Rio de Janeiro; and Estreito hydroelectric plant, one of the largest in Brazil, with a planned capacity of 1,087 MW.

Current projects being carried out by OAS include the infrastructure and concession for utilities and maintenance of the port of Rio, part of the Porto Maravilha project, in concession with Odebrecht and Carioca Christiani Nielsen. For the FIFA 2014 World Cup, it is delivering the Fonte Nova stadium in Salvador together with Odebrecht and was the only bidder for the Natal stadium in Rio Grande do Norte.

OAS part-owns INVEPAR, an investment company which specialises in transport and logistics.

www.oas.com.br

Galvão Engenharia

Awarded the 2010 prize for best company in the construction industry by business journal Exame, Galvão Engenharia was founded in 1996. It provides engineering for and builds pipelines, industrial plant, roads, airports, ports, railways, urban infrastructure, hydroelectric dams, sanitation and buildings, including residential buildings as part of the Minha Casa Minha Vida government programme for social housing. Galvão has experienced very fast growth in the past few years, nearly doubling in size between 2008 and 2010.

Some recently finished and ongoing projects with the involvement of Galvão Engenharia are the São Paulo metro, São Paulo ring road, the 48 MW São Domingos hydroelectric dam in Mato Grosso do Sul and the PPP for the water treatment plant of Taiaçupeba, in São Paulo.

www.galvao.com

Delta Construções

A company founded in Recife in 1961 for road maintenance, Delta is now involved in infrastructure, sewage, civil engineering, concessions and development.

Now based in Rio de Janeiro, Delta built Cidade do Samba, the complex where costumes and floats are prepared for Carnival. The company was also involved in the construction of Maria Lenk aquatics centre and João Havelange stadium for the 2007 Pan American games, as well as the resurfacing works for the landing strip of Rio's domestic airport.

Delta manages landfills and provides urban waste collection services in the states of São Paulo and Rio de Janeiro.

www.deltaconstrucoes.com.br

Mendes Junior

Mendes Junior, founded in 1953, used to be Brazil's largest contractor in the 80's, with work in the country and in Iraq and Mauritania. With the first Gulf War the company suffered severe losses, and went through a slow process of recovery throughout the 90s and is now experiencing renewed growth.

Mendes Junior has long-standing experience in the building of infrastructure, including water and sanitation, and hydroelectric dams, areas in which the company excels. It currently employs approximately 10,000 people in sectors as diverse as ports and airports; energy generation and transmission; oil platforms; pipelines; refineries; industrial plant and transport, among others.

For the World Cup in 2014, Mendes Junior is active in the city of Cuiabá, building Arena Pantanal and the city's BRT lines.

www.mendesjunior.com.br

Gafisa

Gafisa is a developer and contractor dedicated exclusively to commercial and residential development. It is the owner of the Alphaville brand of gated communities, among others.

Based in São Paulo, the company was founded in 1954, and is now present in all major Brazilian cities. The company has a dedicated BIM project office, and plans to roll out BIM throughout, in a move to increase project delivery efficiency and anticipate the capacity crunch already on the horizon.

www.gafisa.com.br

Carioca Christiani Nielsen

Founded in 1947 in Rio de Janeiro, the current company is the result of the merger between Carioca, a Rio-based contractor, and Christiani Nielsen. The merger brought Christiani Nielsen's port building experience to the company.

Carioca is involved in port building, dams, highways, metros, pipelines, sanitation and urban development work. It also deals in real estate and owns or part-owns public concessions in roads and water and sanitation.

Carioca is a partner in the Porto Novo consortium, tasked with delivery of urban infrastructure and the provision of urban services in concession of the Porto Maravilha area of Rio de Janeiro, together with Odebrecht and OAS.

www.cariocaengenharia.com.br

4 The construction sector (continued)

Business opportunities that Brazilian contractors currently see in the market are:

- Airports, for operators and engineers and designers
- Ports, for operators and engineers
- Railways, for operators
- Masterplanning, for investors, engineers, planners and designers
- Sustainability, for engineers and consultants
- Industrial waste disposal, for consultants, engineers and suppliers
- Waste recycling, for consultants and engineers
- Coastal management and remediation, for consultants and engineers
- Urban mobility, for consultants, engineers, designers and suppliers

A list of Brazil's 50 largest contractors can be found in Annex 02.

4.5 Engineering firms

Brazil has a number of well-established and competent engineering companies, with wide experience in all sectors of the construction industry, from structures to infrastructure.

Larger companies will have dedicated teams providing services in the areas of environmental consultancy, power generation and transmission, sanitation, transport and highways, airports, mining and oil and gas extraction. A boom in the market for hydroelectric dams about 10 years ago led to a high level of specialisation in the sector and the spread of EPC (engineering, procurement and construction) contracts, now well understood in the industry. Petrobras, Vale, Hochtief, ThyssenKrupp, Bechtel and Cisco, among many others, will be commonly found in the client list of major firms. Association with contractors gives engineering companies access to public sector projects. The recent increase in public demand is fuelling growth within engineering companies, which find it increasingly hard, to recruit well-qualified professionals. With man-hour costs estimated by one professional at about half those in the UK, Brazilian engineering companies are very competitive. Salaries will tend to rise as professionals become rarer, eroding this competitive edge. The country's top engineering firm, Promon, with man-hour costs of US\$100, recognises that this is a handicap in lowest-price bids for public work and focuses on private clients instead. Internationally, the experience of engineering firms mirrors that of contractors, with the Latin American and African (i.e. Angolan and Mozambiquian) markets as the main areas of overseas operations.

Certification consultancy is done in-house by some companies but sub-contracting to specialist certification firms is very common, as is the subcontracting of sustainability consultancy services, since even large companies admit to lacking the expertise.

The market for high-end consultancy, like pedestrian modelling, integrated building services, disabled accessibility or BIM, is still small, as is the market for masterplanning and intelligent urban systems (smart grids, variable message signage, waste-to-energy technology). Some Brazilian firms are now attempting to position themselves in pole-position to offer a different product from their traditional services in anticipation of opportunities that will be released by the World Cup and the Olympics. British firms may have a role to play in this, where complementary expertise can be offered in partnership.

Brazil's biggest engineering companies are:

Engevix

Brazil's largest engineering company was founded 45 years ago and employs 2,700 people (2009 data). In 2010 the company's turnover exceeded US\$700m. Engevix provides consultancy services, project management and site supervision. It procures many projects as EPC (engineering, procurement and construction) contracts, and has operations in Brazil, Angola, Mexico and Peru.

Engevix's main areas of expertise are: energy, where the company made its reputation building hydroelectric dams and it has experience with thermal and wind farms; deep-sea facilities, maintaining oil rigs for Petrobras; infrastructure, designing and building roads, railroads and airports and industrial facilities, where the company often also participates in EPC contracts.

www.engevix.com.br

Promon

Promon was founded in 1960 as a joint venture between Canadian Montreal and American Procon to deliver the oil refinery at Cubatão, in the state of São Paulo. The company then continued operating in the Brazilian market to take advantage of the "Brazilian Miracle" in the 1960s, building steel mills and hydroelectric dams.

The company was listed in the 1970s and is today entirely owned by its employees. Promon currently has a turnover in excess of US\$500m, and employs 1,600 people (2011).

It offers all traditional engineering disciplines, and has delivered public schools, urban infrastructure (including Rio's Linha Amarela urban toll road) car factories, consumer goods factories, breweries and hydroelectric dams (as EPC contracts), among many more types of projects. It is currently involved in the work for Line 4 of the Rio metro.

Promon is highly respected among its peers, and enjoys a strong reputation among contractors and clients.

www.promon.com.br

Concremat

A family-owned group of companies founded in 1952, Concremat is based in the city of Rio de Janeiro, and has offices in all major Brazilian cities. The companies that make up the group have expertise in the areas of transport, oil and gas, civil engineering, water and sanitation, industry, mining and energy. Each of the companies offers specialist services: environmental engineering, geotechnics, structural analysis/renovation and materials testing being among those offered.

Concremat is a reference in the renovation of historic buildings and structures, having Brazil's best labs and technicians in this area.

Current projects the company is involved in are the Nova Luz urban regeneration project in São Paulo, the refurbishment of Hotel Glória in Rio de Janeiro and the Jirau hydroelectric dam in the state of Rondônia, in the Amazon.

www.concremat.com.br

Business opportunities that Brazilian engineers currently see in the market are:

- Sustainability, for engineers and consultants
- Masterplanning and intelligent cities, for investors, engineers, planners and designers
- Urban mobility, for consultants, engineers, designers and suppliers
- Accessibility, for consultants
- Pedestrian modelling, for consultants and engineers
- BIM, for architects and engineers.

A list of Brazil's 15 largest engineering firms is provided in Annex 02 table 27.

4.6 Architects

The quality of Brazilian architecture is good. The country has a tradition of excellent building design, epitomised by internationally recognised names like Oscar Niemeyer and Paulo Mendes da Rocha and modernist buildings such as Palácio Capanema in Rio de Janeiro and MASP in São Paulo, not to mention the national capital, Brasília. More recent examples of Brazil's creativity and design competence can be found throughout the country, from private residences to a new generation of corporate office and hotel towers in the country's main business districts.

Despite this strong heritage the architectural profession is, however, the construction sector's weakest link. Partly due to the hegemony of contractors through the commissioning of public works at concept design stage, partly due to a weak institutional culture and the lack of political bargaining power. Brazil has few architectural firms organised as corporate structures, the majority being smaller workshop-like operations. This does not necessarily reflect on an office's capacity to deliver, since the most successful firms will sub-contract detailed design to specialist service providers, keeping higher labour costs off the balance sheet and thus avoiding the seasonality of demand and its associated cycle of staff contraction and expansion.

Reflecting the legacy of decades of poor public governance and urban planning policies, the planning profession is even weaker, not for lack of talent but rather for lack of opportunity. Whether the World Cup in 2014 and the Olympics may help to reverse this situation remains to be seen. There is enthusiasm tempered with cynicism in the design community.

Discrete city governments, usually in association with the Brazilian Institute of Architects, are now more aware of the advantages of launching design competitions, like Morar Carioca, or the competition for the Olympic Port of Rio. This helps improve the profile and credentials of the profession and offers market-entry opportunities to young firms otherwise unable to compete with more established practices.

Some of the major offices receive requests to design certified buildings but find that clients are often reluctant to accept any additional capital costs associated with certification, in spite of their appreciation of the additional market value that accrues to the finished building.

4 The construction sector (continued)

Major Brazilian firms are familiar with the dynamics of international partnerships, which they see as good opportunities to learn international best practice. They will not, however, waive their right to be involved in the concept design stage, and will usually refuse to simply become local delivery partners in charge of construction drawings only.

Architects' fees in Brazil are around half those paid in the US and Europe. The market is very savvy, and will not pay above Brazilian rates for foreign firms, so a degree of flexibility will be needed by foreign firms that want to work in the Brazilian market.

Frustration with the services offered by traditional engineering firms is common among architects. A particular complaint is the lack of holistic vision, with engineering disciplines usually thinking inside the box and not being able to maximise the synergy between disciplines. Contracting company A for one discipline, B for another, and C for yet another adds a managerial complexity to projects that impacts on the ultimate quality and budget for the delivered work. In spite of charging higher fees, British companies that offer an array of well-integrated engineering disciplines are not necessarily less competitive for some work in Brazil, given that they tend to deliver more efficiently than the multiple team approach described above.

4.7 Entering the market

Brazil is not for beginners! - warns José Roberto Bernasconi, president of the São Paulo chapter of the National Association of Architects and Consulting Engineers (SINAENCO). Foreigners entering the market will need to compete not only with Brazilian firms, who have a crucial head start in a complex and very competitive business environment but also with their competitors back home.

The key is to find the right partnerships, ideally with a major contractor. Market dominance by contractors is an idiosyncrasy of the Brazilian market that many would like to end but significant change is not likely in the immediate future, given contractors' ability to absorb large amounts of unskilled labour. Traditionally, this creates little appetite for unconventional construction methods, which are seen as more expensive and nearly impossible to deliver with poorly educated (but cheap) staff, so there is political interest in the status quo. It is precisely the scarcity of labourers, however, due to the large amount of infrastructure and private projects currently taking off in Brazil, that may lead to a paradigm shift.

British companies' best business card is the 2012 Olympics. Although a red carpet will not be rolled out by local industry to British, Continental or American firms, genuine interest exists in the achievements of British industry linked to the delivery of an Olympic Games that will raise the sustainability bar to new levels. It is precisely this top-end expertise that will recommend the credentials of British firms to Brazilian associates. It will be necessary to convince local partners of the complementarity of a potential partnership. Being seen as just another competitor vying for a piece of the cake, that Brazilian firms have been waiting decades for, is unlikely to be a fruitful approach.

Any attempts to settle in Brazil should be preceded by thorough market research to understand the roles played by different companies and people within them, the local business practices (Rio de Janeiro and São Paulo are very different environments) and the legal hurdles one is likely to encounter along the way, which can be significant.

Once in Brazil, adapting to local custom is paramount. Tropicalisation, as Brazilians jokingly refer to the process of becoming local, involves becoming acquainted with local hierarchy, body language, communication habits and dress code.

Do not expect that even senior managers will all speak fluent English. While many are educated in the United States or Britain, and will be keen to practise, many more will need to be addressed in Portuguese when the conversation goes beyond the exchange of greetings, so hiring native speakers is essential. It also shows the commitment of the company to the market, and helps create the personal bonds that form the basis of Brazilian business.

5 Opportunities further afield

A photograph of a grand, ornate theater interior. The view is from an elevated position, looking down at the tiered seating. The theater features a curved balcony with ornate railings and a ceiling with a large, circular light fixture that creates a starburst effect. The lighting is warm and golden, highlighting the architectural details and the rows of seats. The overall atmosphere is one of elegance and grandeur.

5 Opportunities further afield

5.1 Overview

The 2016 Games will bring a large amount of investment to the city of Rio de Janeiro. The billions of dollars the project will inject into the local economy are, however, only a fraction of the total investment flowing into the state of Rio, mainly linked to infrastructure. The state is experiencing a surge in industrial and logistical development and has set up a dedicated agency for the promotion of business in the state, CODIN (Company for the Industrial Development of the State of Rio de Janeiro) which works with both existing and potential investors and with municipalities that wish to attract business, as well as InvesteRio, a dedicated funding agency for the state. Most state-sponsored projects are in areas like roads, public transport, railroads and social housing.

Significant projects in the state will be Line 3 of the Rio metro, linking Rio city to Niterói and São Gonçalo, across the Bay of Guanabara, to serve the area of influence of COMPERJ, Rio's petrochemical district to the east of the capital, and Brazil's largest single investment, at US\$8.7bn; the re-launch of the Centro-Atlântica freight railway (FCA), in the north of the state, owned by mining giant Vale; a 30MW wind plant in São Francisco do Itabapoana and the Angra 3 nuclear power station, which will raise energy generation in the state above forecast demand by the time it is completed.

Private investment in the state will be mainly in activities that either support or derive from mining (steel mills, ports and roads/rail lines) or the oil and gas sector (ports, transport and power plants). These anchor investments generate spin-offs that are significant projects in their own right, like the planned Nissan plant close to Porto do Açu, in the north of the state. This is a deep-water port facility with an associated high-capacity industrial park. It is a private development by Eike Batista (one of Brazil's leading entrepreneurs and world's richest people) and this port will service, in part, his large mining and oil & gas interests.

Decision Rio 2010-2012 is an investment guide published by the Federation of Industry of the state of Rio de Janeiro (FIRJAN). It puts the level of investment between 2010 and 2012 at US\$75bn, split among the following areas:

Table 18 Investment in the state of Rio de Janeiro, Decision Rio 2010-2012

Sector	Investment USDm	%
Petrobras	46,008	61
Infrastructure	17,066	23
Industry	12,114	16
Others	179	0.2
Total	75,367	100



The largest projects in the state, according to the same report are:

Table 19 Largest projects in the state of Rio de Janeiro, Decision Rio 2010-2012

Investment	Sector	Location	Type	Value USDm
Comperj	Petrochemicals	Itaboraí	Startup	8,712
Chevron	Energy	Campos	Startup	2,626
Açu thermal plant	Energy	São João da Barra	Startup	2,566
Angra 3 nuclear plan	Energy	Angra dos Reis	Startup	2,387
CSN Logistical hub, Itaguaí	Transport/Logistics	Itaguaí	Expansion	2,208
Açu port	Transport/Logistics	São João da Barra	Startup	1,193
OGX	Energy	Campos	Startup	895
EISA	Naval industry	Rio de Janeiro	Shipbuilding	835
Fisher Group	Naval industry	Several	Expansion	776
Southeast port	Transport/Logistics	Itaguaí	Startup	656
Light AS / UHE Itaocara	Energy	Several	Startup	358
Gerdau port terminal	Transport/Logistics	Itaguaí	Startup	358
MRS Logística	Transport/Logistics	Several	Expansion	239
STX Europe	Naval industry	Niterói	Shipbuilding	239
Coquepar	Petrochemicals	Seropédica	Startup	179
Michelin	Rubber	Itatiaia	Startup	179
Total				24,406

Further reinforcing the state of Rio as Brazil's main energy hub, the discovery of vast oil reserves (estimated at between 70 and 90bn barrels) under the salt layer, known as pre-salt, in a zone some 800 km off the coast of Rio will sustain the development of the sector for several decades to come.

British firms that want to participate in this highly dynamic environment can make use of the UK's experience in several areas:

- Meeting the demand for suitably qualified professions to fill the skills gaps in the oil and gas sector. These skills shortage are identified as being in the project, administrative and operating areas and solutions being pursued include importing skilled labour and using innovative cutting-edge technologies. This sector has enormous potential for growth and as a result the industry is closely followed by the leading contractors, which will welcome partnerships with companies that add value to a bid.
- While not new industries as such, industrial waste disposal has become a hot topic for clients like Petrobras. This interest will only increase as their level of investment grows. As a public company, Petrobras tenders its work and competition is fierce. Brazilian contractors will see the benefits of associating with companies that have cutting-edge technology in order to improve their credentials in public competitions for this sort of work.
- Similar opportunities exist for urban waste disposal and recycling. However, the market is very local and hence subject to the varying levels of efficiency and transparency present in the different municipal and state governments. Growth in this area is being driven by privatisation and PPPs are becoming more common. The country's main contractors are aware of the growing opportunities and they have set up concession firms that specialise in this sector. With most such projects being offered in public tenders, access to expertise and technology will benefit bidding consortia

5 Opportunities further afield (continued)

- The same goes for companies with experience in environmental remediation, as this sector suffers from a decades long backlog where little or nothing has been done. There are now new opportunities being created by industrial clients, as they are now becoming more thoroughly scrutinised than before

5.2 World Cup 2014

Brazil has the task of building 12 stadia all over the country by 2014. There is some scepticism regarding the extent to which the opportunity to create an urban legacy in each of the cities will be realised. Some of this scepticism is a direct result of the failure to achieve a workable legacy from the 2007 Pan American Games. There are however a host of mobility projects under way, but only more ambitious states and some contractors have realised the commercial potential of stadia and the wider planning opportunities the event may unleash.

The stadia, though, will need to be ready on time and deliver a spectacle for the thousands of visitors and the millions who will tune in. Given that projects were awarded at concept design stage, as is usual practice, work still needs to be done in order to turn the bid entries into feasible projects. Though work is already under way on several sites, the detailed design and fit-out options have generally not yet been concluded.

This opens possibilities to British firms with stadium design experience, particularly those involved in projects that have a strong urban component. With sustainability still not well understood in Brazil, at the urban scale, companies with such capability have a value added offer to bring to a partnership with the contractors leading the construction work.

Opportunities for planning and fit-out of building systems like lighting and sound, electronic building monitoring, seating, signage, turf and others are still open to both consultants and suppliers that offer a cutting-edge product. Likewise, accessibility and security consulting of the type needed for high-security FIFA events is not commonly available in the market, so opportunities exist for companies that provide such services.

Once the World Cup is over, the need to maintain and use the structures will require professional facility and event managers with international experience like that found in the UK.

The list of stadia being built for the event and the names of the contractors delivering them is given below.

5.3 Hotels and accommodation

The Brazilian hotel market is experiencing high growth, fuelled by solid demand, mostly internal rather than international. With increasing purchasing power, the Brazilian middle classes are acquiring the travel habit, both within the country and abroad.

Table 20 World Cup investment and contractors/engineers

Host city	Consortium	Contract value, US\$M	Comment
Belo Horizonte	CONSTRUCAP, EGESA and HAP ENG	443	-
Brasília	ANDRADE GUTIERREZ and VIA ENG	416	-
Cuiabá	MENDES JUNIOR and SANTA BARBARA ENG	205	-
Curitiba	-	90	-
Fortaleza	GALVÃO, SERVENG and BWA	270	-
Manaus	ANDRADE GUTIERREZ	298	-
Natal	OAS tendered	251	Estimate
Porto Alegre	-	143	Estimate
Recife	ODEBRECHT	277	-
Rio de Janeiro	ANDRADE GUTIERREZ, ODEBRECHT and DELTA ENG	537	-
Salvador	ODEBRECHT and OAS	353	-
São Paulo	ODEBRECHT	179	Estimate
Total		3,461	

Both national and international hotel groups are aware of the necessity to serve this future demand and have established growth plans for the country. For example, the Accor group currently plans to build a total of 146 hotels in the next five years and Marriott has agreed to the construction of 50 Fairfield Inn hotels in partnership with the Brazilian group PDG Realty. National groups that plan to expand include Intercity, Blue Tree and BHG, among others.

There are three main investment models in the hotel business in the city of Rio. About 75% of all hotel capacity in the city is provided by independent operators, whose portfolio can be as little as one unit. The two largest independent chains in Rio are Othon (with seven hotels in the city out of a total of 24 worldwide) and Windsor (ten hotels, all in the city). The remaining quarter is composed mostly of franchised units. Some very few establishments use a fractional-ownership model.

The city of Rio de Janeiro plans to meet the demand for the FIFA World Cup in 2014 and the Olympic Games in 2016 both with the construction of new hotels and the refurbishment/upgrade of existing units. Much of the new hotel capacity being planned will be located in Barra da Tijuca. With Barra becoming a business centre in its own right, new hotels will cater for business travellers and tourists in the post-Games period, and are a necessary complement to the city's constrained hotel offer, which is concentrated in the congested southern area of the city, where little room exists for new large ventures.

Faced with high operating costs, hotel operators are keen to reduce overheads. Hotels in the city face energy costs of up to 14% of their total expenditure, well in excess of the usual 6-8%. Due to progressive charging, water is also a high cost commodity for hotels. Strategies for the reduction of consumption, by using efficient appliances and recycling mechanisms in the case of water, as well as passive cooling and efficient lighting and water heating technology, are currently being sought by hotel owners. The larger hotel groups employ sustainability specialists to address these issues. In some cases, like Marriott, there is the aspiration to seek LEED accreditation for all units.

Hotels that are designed in a sustainable manner, or use energy efficiently according to BNDES's parameters, can benefit from favourable credit conditions that may extend the payback period up to 18 years, as opposed to the usual six to eight years for conventional projects. Interest on financing for sustainable hotels is commonly set at 6.9% (low by national standards).

With low unemployment rates, the construction business that has been historically heavily reliant on a pool of cheap unskilled labourers, has struggled to maintain its capacity for delivery. This is expected to worsen as building activity ramps up towards the FIFA World Cup. Heavier labour costs have also driven up the cost of construction, opening up opportunities for pre-fabrication. Pre-fabrication will only be acceptable to contractors and developers of hotel properties (and others) where the offer is for a highly distinctive and customisable product. And this only provided that the mark-up on imports does not erode the competitive advantage of such products. This should stimulate and argues strongly for, joint venture to provide local manufacture or the setting up of production lines in country.

5.4 The role of UKTI

Additional opportunities in Brazil exist in the airport, oil and gas, port, rail, mining and many other sectors. UKTI has three main offices in the country, in São Paulo, Rio de Janeiro and Brasília, with satellite trade offices in Recife (covering the north and northeast) and Porto Alegre (covering the south). UKTI can offer support to UK businesses operating in any sector but has dedicated teams covering the following areas:

- Oil and gas
- Education and Training / Creative Industries
- ICT
- Advanced Engineering / Mining
- Environmental Technologies / Construction
- Life Sciences
- Power / Renewables / Petrochemical
- Global Sport Infrastructure
- Defence
- Chemicals
- Marine

UKTI staff have extensive knowledge of the market, as well as valuable contacts in the public and private sectors. Our market research will help you identify the best opportunities for your business and the right local partners or representatives. We can also help you to organise your visit to the market. In short our aim is to save you time and money while reducing your commercial risk, so that you can concentrate on winning business in the dynamic and rapidly evolving Brazilian market.

See page 99 for contact details of UKTI team members.

5 Opportunities further afield (continued)

Table 21 Hotel groups and investment plans

Group	Main brands		Units	Expansion	Investment value USDm
BHG Group	Golden Tulip, Txai resorts, Intercontinental		30 hotels and resorts	40 hotels in 5 years 8 per year	286
Accor Group	sofitel	4	143 hotels 22,494 rooms 7,100 employees	700,000 rooms in 5 years 46 new hotels	338
	novotel	11			
	mercure	64			
	Ibis	53		100 in the next 5 years	
	Etap Hotel/formule 1	11			
Blue Tree Group	Blue Tree		23 hotels and resorts (5 to be built)	45 hotels in next 5 years	406
Intercity	Intercity		16 hotels	26 in the next 5 years	
Grupo Allia	Plaza Inn, Solare, Bristol		40 hotels 3,000 rooms 1,600 employees	30	597
Atlantica Hotel	71		12,000 rooms	21 hotels until 2014	328
	Go inn	1		0, 1, 1, 2 (2011, 2012, 2013, 2014)	
	Park inn	0		0, 0, 0	
	Comfort	19		2, 1, 2, 5	
	Sleep inn	6		0, 1, 0	
	Park Suites	2		0, 0, 0	
	Quality	26		3, 0, 0, 1	
	Confort Suites	7		1, 0, 0	
	Radisson	6		1, 0, 0	
	Four Points	1		0, 0, 0	
Clarion	3	0, 0, 0			
Mariott	Fairfield	0	2,000 employees, 18 offices	50 hotels	1193
	Marriot	3			
	Renaissance	1			
Starwood	Sheraton	5	6 hotels	-	-
	Four Points	1			
Four Seasons	Four Seasons		0	3 hotels	215
Windsor	Windsor		10 hotels	5 new hotels/ 1,830 rooms	-
Hyatt	Grand Hyatt		1 hotel	15 hotels	149
Hilton	Hampton		2 hotels	30 hotels	-
	Hilton Garden Inn				
	Double Tree				
Total					3,781

6 Conclusion

6 Conclusion

Brazil's moment has come. Never before in the country's history has so much come together so neatly to lay the foundations for success. Now a well-established and thriving democracy, the country is reaping the benefits of the sound macro-economic policies implemented by the Cardoso government in the 90s and continued by the Lula and Rouseff administrations. Brazil recovered quickly from the recent economic crisis, and is now back on the growth path, with the economy estimated to grow at a healthy rate of 5% PA until at least 2013.

Brazil has come a long way in the past two decades. It is now a serious destination for foreign investment, a leading agricultural exporter, and a growing oil producer. Quickly becoming a middle-class country, the country is a net importer of consumer goods. Its economy is, however, still very dependent on the export of commodities (and hence China as a customer). This dynamism has had the effect of laying bare the country's shortcomings: opaque bureaucracy, poor infrastructure, low educational levels, old-fashioned labour laws, overly complex taxation systems and persistent regional inequalities. These continue to stand in the way of business. But the ever present national optimism was vindicated with the award of the 2014 FIFA World Cup and the 2016 Olympic and Paralympic Games and the country is now looking forward to the challenge, and prestige, that comes with hosting these events.

Although dogged by some delays, the structures to deliver the 2016 Games are now emerging, and the appointment of the respected former Central Bank director Henrique Meirelles as head of the APD has met with the approval of the other Olympic bodies and public opinion. Once his Olympic Public Authority is up and running the planning for the Olympics will proceed at a quicker pace. With the Rio 2016 Games will come real opportunities for British companies, they are well qualified to deliver such a complex programme on time and on budget and they (perhaps uniquely) can point to the successful experience of the London 2012 Games as evidence of this. From project management to sustainability, accessibility planning and temporary structures, British expertise will be necessary to meet the goals and deadlines set for the event. This is clear to the UK businesses already engaged and increasingly to the authorities charged with delivering Rio 2016. The leading contractors are beginning to understand the important role that UK expertise can play in making the Brazilian Games a success. The challenge is to join these partners up, matching needs, expectations, skills and ambitions in a way that maximises the long term benefit for all.

One way this can be done is to capitalise on the interest, on the part of Brazilian contractors, engineers and architects, in partnering with British firms - who have an excellent reputation among the local construction industry - to tender for Olympic work. The benefit for the UK company in partnering early with a Brazilian counterpart is that this will give those companies a chance to build the relationships and working level understanding that will enhance any bid for Olympic work. The public procurement procedures in Brazil are complex and while they are intended to make the process fair and transparent, they make quick decision making impossible. They also encourage very tight competition, so direct prior Brazilian experience will count in your and your partners' favour.

British know-how will be particularly valuable for the Olympic Park and the Olympic Training Centre:

- Olympic Park. The masterplan for the 1.6m sqm area will offer opportunities for masterplanners, architects, access consultants, environmental consultants, infrastructure engineers (water, sewage, power, power generation, waste-to-energy, drainage) sustainability and accessibility specialists. Security specialists will need to be involved both at the planning stage and during the Olympic phase. Given the likelihood that an Olympic phase will be followed by a change of use in legacy, the planning becomes doubly complex
- Olympic Training Centre. Already committed at bid stage to being a highly sustainable facility, the OTC, with an area of 65,000 sqm, will require an ambitious degree of integration of building services, innovative use of materials, and low water and energy consumption. The opportunities associated with the centre, which will be tendered publicly, will be in the areas of architecture, engineering (structures, MEP, HVAC), sustainability consultancy, supplies (seating, lighting, signage, equipment, audiovisual equipment) accessibility consultancy and security

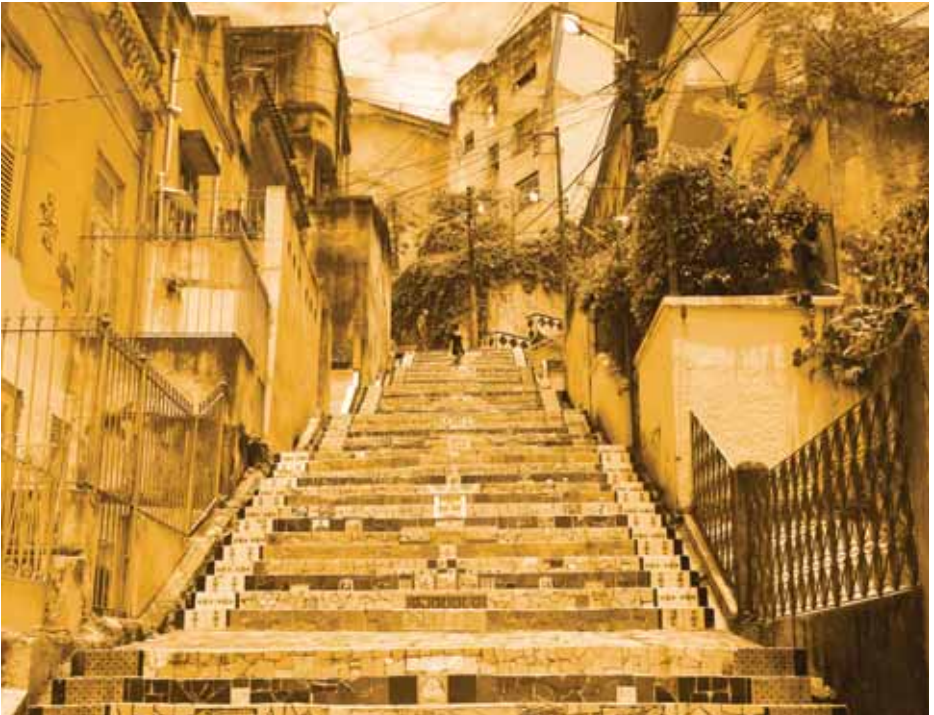
Further afield, in the port of Rio the country's largest urban project is under way, with opportunities for engineers, architects, project managers and investors, to deliver 5m sqm of development over the next decade. The consortium in charge of building the infrastructure and providing public services will require specialist consulting for waste collection, sewage disposal, drainage, smart metering and street lighting, as well as, construction materials to deliver the programme of works.

Partnerships are then the key to entering the Brazilian market, which is dominated by a few giant firms. The business opportunities that will arise from a successful partnership will transcend the finite portfolio of Olympic projects, and include all the growth sectors in the construction industry. Brazil offers opportunities in airports, which will experience some form of privatisation probably this side of the FIFA World Cup; ports, an area that is already being targeted by contractors who see opportunities to build and operate in partnership with British operators; oil & gas, where demand for technology is high and professionals are sought; waste disposal; environmental remediation; sustainability consultancy; building services, lightweight structures and many more on a project-by-project basis.

And even the World Cup 2014 still presents opportunities for suppliers and consultants, but time is of the essence, as structural work is already under way.

Finally, Brazil is waking up to sustainability. Recent legislation for contaminated land is opening up a whole new industry, interest in certification is growing and the Olympics will add an unprecedented level of complexity to the sustainability practice in the country. Institutionally, there is a good grasp of the task ahead and enthusiasm about being ahead of the curve but industry is still catching up: architects, engineers and contractors alike admit that delivering high-spec sustainability in the short term will be challenging without the use of some imported skills and experience.

For Britain too, our moment in Brazil has come.





Annex 01

Information from the Rio bid book

Bid document tables

Unless otherwise stated all information is taken from the Rio 2016 Bid Document

Table 22 Olympic Village construction timeline

Construction stages	2010	2011	2012	2013	2014	2015	2016	2017
Site preparation	■	■	■	■				
Concept design	■	■	■					
Development approvals		■	■	■				
Urban infrastructure construction				■	■	■		
Detailed design			■	■	■	■	■	
Village construction				■	■	■	■	■
Temp overlay design					■	■	■	
Temp overlay tender						■	■	
Temp overlay construction							■	■
Village fit-out and handover								■
Security 'lock-down'								■
Games time								■
Retrofit, legacy conversion								■

Table 23 Airport data

Capacity	Rio International GIG		Rio Domestic SDU		São Paulo International GRU		Brasília BSB		Belo Horizonte CNF		Salvador SSA	
	2008	2016	2008	2016	2008	2016	2008	2016	2008	2016	2008	2016
Number of terminals	2	2	1	1	2	3	2	2	1	1	1	1
Number of international departure gates	23	30	0	0	22	54	3	3	5	5	6	9
Number of national departure gates	24	34	12	12	22	22	18	42	14	15	10	21
Passengers/hour	9,100	15,000	3,000	5,000	5,153	18,000	1,275	5,000	2,054	4,500	680	5,000
Runway movements/hour	54	54	50	50	61	61	95	95	47	47	45	45
Night flight ban	No restrictions		Closes at 23:30		No restrictions		No restrictions		No restrictions		No restrictions	

Table 24 CET-RIO's assets

	End	Junctions managed	No. of Cameras	Traffic loops	VMS	OCR	Control Centre
Current Infrastructure	-	1,100	93	200	-	-	1
Upgrade Phase 1	Oct 2009	-	73	120	13	61	Upgrade
Upgrade Phase 2	2014	1,500	100	1,000	10	302	CCO
Total		2,600	266	1,320	23	363	2

VMS = Variable Messaging Systems; OCR = Licence plate identification

Annex 01

Information from the Rio bid book (continued)

Table 25 Venue modifications for Paralympic Games

Venue	Sports	Gross seating capacity (+ existing accessible seating)	Modification required (+ planned accessible seating)	Estimated cost of modification (US\$ thousands)
Competition venues				
OTC - Hall 1	Wheelchair Basketball, Wheelchair Rugby	10,500 (1%)	FOP/Accessible seats upgrade (1.8%)	230.7
OTC - Hall 2	Judo, Boccia	7,000 (1%)	FOP/Accessible seats upgrade (1.5%)	364.6
OTC - Hall 3	Volleyball (sitting)	10,000 (1%)	FOP/Accessible seats upgrade (1.3%)	255.6
OTC - Hall 4	Goalball	7,000 (1%)	FOP (1%)	92.0
Olympic Hockey Centre	Football 7-a-side	10,000 (1%)	FOP (1%)	144.4
Olympic Hockey Centre	Football 5-a-side	5,000 (1%)	FOP (1%)	78.2
Olympic Tennis Centre	Wheelchair tennis	10,000 (1%)	Accessible seats upgrade (1.5%)	216.7
Olympic Aquatics Stadium	Swimming	18,000 (1%)	Accessible seats upgrade (1.5%)	54.0
Rio Olympic Velodrome	Cycling (track)	5,000 (1%)	N/A (1%)	137.8
Rio Olympic Arena	Wheelchair Basketball	12,000 (0.25%)	FOP/Accessible seats upgrade (1.3%)	431.4
Riocentro - Pavilion 3	Table Tennis	5,000; 2,000 (1%)	Accessible seats upgrade (1.5%)	95.1
Riocentro - Pavilion 6	Powerlifting	4,550 (1%)	FOP/Accessible seats upgrade (1.5%)	111.2
Lagoa Rodrigo de Freitas	Rowing	7,000 (1%)	FOP/Accessible seats upgrade (1.5%)	326.1
Marina da Glória	Sailing	5,000 (1%)	N/A (1%)	35.4
Flamengo Park	Marathon, Cycling (road)	2,500 (1%)	FOP (1%)	256.8
Sambódromo	Archery	4,200 (1.5%)	FOP (1.5%)	836.0
João Havelange Stadium	Athletics (track and field)	60,000 (0.5%)	FOP/Accessible seats upgrade (1.2%)	289.6
National Shooting Centre	Shooting	1,600; 1,000; 750; 500 (1%)	Accessible seats upgrade (1.5%)	88.1
National Equestrian Centre	Equestrian	7,000 (1%)	FOP/Accessible seats upgrade (1.2%)	171.8
Deodoro Arena	Wheelchair Fencing	2,500 (1%)	FOP/Accessible seats upgrade (1.5%)	289.0
Non-competition venues				
Paralympic Village	Accommodation	N/A	N/A	403.3
MPC	Press centre	N/A	N/A	82.0
IBC	Broadcast centre	N/A	N/A	116.0
Paralympic Family Hotel	Accommodation	N/A	N/A	39.0
Maracanã Stadium	Ceremonies	90,000 (0.5%)	Accessible seats upgrade (1%)	1,556.2
Total				6701.0

FOP = Field of Play

Table 26 Sustainability Management Plan Actions

Theme	Rio 2016 proposed actions	Government engagement
Water Conservation Games		
Water Management and treatment	Construction guidelines for Games venues following international water saving standards, such as dual water saving flushes	Ensured by the Federal Government's National Sewage Programme (2008) which defines clear targets of treatment at national, state and municipal levels. Investment of US\$ 4 billion is already committed for restoration programmes (Guanabara Bay Sanitation Programme and Barra-Jacarepaguá Sanitation Programme) which will result in more than 80% of overall sewage collected and treated by 2016. Lake water quality: US\$ 165 million committed by the private sector and by CEDAE to complete full regeneration of Lagoa Rodrigo de Freitas, and the Jacarepaguá Lake in the Barra Zone. The beaches water quality index, according to the National Environment Council's guidelines will be elevated from 50% to 80% for primary contact (bathing) and monitoring will be significantly expanded
	Extensive deployment of grey water recycling and secondary use of rainwater for irrigation as part of the Rio 2016 Green Building Programme	
	OTC facilities, Olympic and Paralympic Village and X Park with self contained sewage treatment units	
	Restoration of Marangá River course in Deodoro Zone by a community programme	
Environmental education and awareness	Olympic Eco-Citizenship Programme promoting sustainability for all Rio civil groups	Extensive school environmental programmes will increase awareness of climate change impacts and the ways individuals and communities fight against this global phenomenon; other programmes will focus on lagoon protection
	New permanent Ecomuseum, centre for environmental education and culture within Rio Olympic Park. With the support of local NGOs, local Agenda 21 projects will be undertaken	
Renewable Energy Games		
Energy supply and conservation, renewable energy use and management	Overlay construction with self-supplying renewable energy generators powered by ethanol for broadcasting and mission-critical operations	The 'National Programme for Production and Use of Biofuel' launched in 2004 is ensuring a progressive and sustainable diffusion of biofuel in the local market leading to significant reduction of diesel importation and improvement in the national renewable energy matrix.
	Swimming pools with solar panels for water heating in OTC and Modern Pentathlon venues	
	Extensive photovoltaic cells in the OTC Halls to minimise energy demand for lighting	
	Brazilian hydrogen cell technology, powered by ethanol, in all overlay for lighting operational areas	
	Energy management systems in new buildings	
	Within the existing State Government's Vegetable Oil Gathering Programme, oil disposed from the Olympic and Paralympic Village, MPC/IBC and venues recycled into biodiesel	

Table 26 Sustainability Management Plan Actions

Theme	Rio 2016 proposed actions	Government engagement
Air quality and transport	100% public transport for spectators and workforce	Although Rio's air quality is within WHO standards, in 2009 a Nationwide Air Quality Programme, promoted by the Federal Government, will be undertaken. This will lead to an increased number of monitoring stations, increased control over NO ₂ , SO ₂ and O ₃ , engagement in the incentive State Plan of Action for the Reduction of Greenhouse Gas Emissions, enhancement of the Automotive Vehicle Air Pollution Control Programme and reduction of sulphur levels in diesel
	Expansion of the city's cycle lane network to connect Games zones and, within each zone, Games venues	
	100% of T1-T3 fleet running on ethanol	
	100% of public bus fleet with high percentage use of clean fuel (biodiesel, ethanol)	
Ecosystem and soil protection	Soil contamination analysis in each new construction site	Through a series of programmes and laws, including the National Climate Change Plan, 'Mata Atlantica' Law approval, 'Zero Illegal Deforestation' Programme, Environment Licensing Decentralisation and Environment Compensation Fund, a plan is being developed to strengthen the protection and conservation of all city forests and parks and the preservation of local biodiversity Creation of the Carbon Park with more than 24 million trees to be planted
	Increased green spaces in the city by the creation of new Games venues, for cultural events and outdoor recreation	
	In OTC, X Park, Marina and Lagoa Rodrigo de Freitas a preventative study undertaken to ensure the preservation of natural areas of fauna and flora	
Carbon Neutral Games		
Sustainable venue design/construction and noise pollution	Implementation of strict LEEDs guidelines and certification of 100% of new buildings with reduced consumption of natural raw materials and use of renewable natural resources	Government institutions, Green Building Council (GBC) of Brazil and the Brazilian Sustainable Building Council (CBCS), are developing extensive work on improving the quality of construction. For the legacy constructions, Government will implement sustainability criteria throughout the concept, planning, construction, operation and maintenance phases
	Minimum distance criteria for material transport and reuse of demolition waste including relevant overlay materials	
	Extensive implementation of green areas and water ponds in venue designs	
	Full compliance with national environmental legislation and regulations for environment assessment and noiseless constructions	
	Transport corridors will be constructed with acoustic barriers through urban tree planting and landscape design	

Table 26 Sustainability Management Plan Actions

Theme	Rio 2016 proposed actions	Government engagement
Reforestation, biodiversity and protection of environment and cultural heritage	The Games Carbon Neutral offsetting programme in a 1,360 hectare 'Carbon Park' in Pedra Branca Park where 3 million trees will be planted in association with the State Forest Institute out of the overall 24 million trees that will be planted in the region by 2016	The Agenda 21 Education for Sustainability works at the venues, coordinated through the Ecomuseum, will focus not only on integrated sports and environment activities; it will also promote the cultural traditions of Rio's multi-ethnic society, integration of art shows, modern technologies, contemporary creative street art formed by reusing waste materials opening new possibilities for creativity without jeopardising authentic traditions
	The X Park fully converted into a protected public park with an extensive reforestation plan, reintroducing rain forest species. The plan will designate local residents to maintain the park's sustainability in the long term	
	Rio Olympic Park landscape and reforestation over 40 hectares	
	Catering for Olympic and Paralympic Village - 100% supplied with organic food enhancing biodiversity	
Green procurement and certification	Internal procedures by Rio 2016 procurement to ensure green compliance for all tenders	A strong Sustainable Procurement Programme from the State Government of Rio is being implemented with support of ICLEI (International Council for Local Government for Sustainability), providing a significant change in the local market procedures
	All Green Office principles adopted in Rio 2016 and all venues adhering to the concepts of nature-friendly equipment, furniture, supplies and waste management. ISO 14000 certification process completed in accordance with international standards	
Waste Management and Social Responsibility		
Waste Management	100% of new buildings sending demolition waste to new recycling plants	City and State Governments will introduce integrated waste management systems ensuring maximisation of recycling and will launch a new perspective for reuse of materials in all phases of the event: by installation of methane gas pumps from landfill for energy production and carbon credit generation, deployment of construction and demolition plants, the eradication of all illegal landfill in the city by 2010 and enhancement of the Recycling Cooperative National Movement
	Self-contained recycling plants for separate streams (recyclable and organic) in large venues to minimise waste send to landfill, and to lead to a zero waste approach	
	Catering contractors will comply with packaging waste minimisation including biodegradable packaging materials	
	Rio 2016 and NGOs together will create a programme to recycle disposable Games assets	

Table 27 Government Security Projects

Programme	Objective	Start	Finish	Cost US\$ (000)
C3 and surveillance capability	Improve security by predictive analysis of crime trends; improve police resourcing and enhance surveillance and intelligence processes. Includes the expansion of CCTV systems throughout the metropolitan area.	2008	2011	3,000
Improved Police Training systems	Specialist training for police officers in community engagement and conflict resolution.	2009	2011	3,420
Initiate PRONASCI scholarships	Provide scholarship funding as an incentive for police officers to improve professional skills.	2008	2012	3,399
Increase Civil Police Officer numbers (Genesis Project)	Enhance the professionalism of the Civil Police by streamlining promotion and career progression, and introducing a stringent public examination process for promotion.	2008	2011	64,750
Increase Civil Police training and productivity	Improve the management, operational and admin capability of Civil Police to increase capability by updating management position requirements and placing more emphasis on behavioural training and improving police culture.	2009	2010	5,378
Establish Forensic Science Posts	Establish Forensic Science posts on a police region basis to enhance the investigative capability within the Civil Police at the local level by decentralising forensic science function.	2008	2009	11,800
Centralise specialised police functions (Police City Project)	Generate efficiencies in specialised policing by unifying these commands in a central police complex.	2009	2010	50,000
Increase Military Police numbers	Increase the Military Police headcount from 38,000 (current) to 54,000 by 2012, enabling a permanent police presence in high risk areas of the community.	2009	2012	57,600
Introduce intensive training for Military Police	The introduction of specialist courses: 1. Tactical response - incorporating incident command and police intelligence 2. Community policing and conflict resolution, incorporating care of vulnerable groups and training of community support officers 3. English and Spanish language courses	2008	2016	5,962
Enhance crime prevention and high profile policing	Target the prevention of violence in Rio by creating the High Profile Policing Group, restructuring of the existing Transport Policing on Urban Buses and increasing the use of police patrol vans as a visible deterrent.	2009	2011	20,000
Initiate Military Police officers physical and mental health programme	Specialist programmes aimed at reducing workplace absence for psychological problems: 1. Implementing psychological monitoring of police working in areas of violent conflict 2. Enhancing a culture of pride in the Military Police and its values 3. Socio-economic and psychological profile mapping of Military Police officers 4. Improving the physical fitness of Military Police officers	2009	2016	4,800

Annex 02 Contractors and engineers

The tables below are sourced from “O Empreiteiro” magazine, July 2010

Table 28 Brazil's 50 largest contractors

Ranking 2010	Company	State	Gross revenue US\$ x 1,000	% of revenue from government*	% of revenue from private sector*	% of revenue from real estate projects*	Activity
1	Norberto Odebrecht	RJ	2,649,378	62	38	-	ABCDEFGHIJKLMNO
2	Camargo Corrêa	SP	2,635,628	35	65	-	ABCDEFHIJKLMNO
3	Andrade Gutierrez	MG	2,094,011	72	28	-	ABCDEFHIJKLMNOTU
4	Queiroz Galvão	RJ	2,020,292	100	-	-	ABCDEFGHIJKLMNO
5	OAS	SP	1,307,759	59	41	-	ABCDEFGHIJKLMNO
6	Galvão Engenharia	SP	1,065,653	51	49	-	ABCDEIJK
7	Delta Construções	RJ	1,056,000	-	-	-	ABCJJO
8	Mendes Júnior Trading	MG	690,703	80	20	-	ABCDEFGHIJKLMNO
9	Gafisa	SP	614,718	-	-	100	PQRSUV
10	Carioca Christiani-Nielsen	RJ	601,585	50	50	-	ABCDEHIJKMO
11	Construcap CCPS¹	SP	547,960	50	50	-	ABCDEFGHIJKLMNPOQR
12	EIT - Empresa Industrial Técnica	CE	472,150	70	30	-	ABCDEIJKMOP
13	MRV Engenharia	MG	457,619	-	-	-	PQRS
14	Egesa Engenharia	MG	403,039	87	13	-	ABEIJKNO
15	Construtora Tenda	MG	376,491	-	-	-	PQRS
16	Tecnisa Engenharia	SP	369,045	-	-	-	PQRSV
17	WTorre¹	SP	351,521	-	100	-	DPQRSTUV
18	Serveng-Civilsan	SP	340,887	77	23	-	ABCDEHIJKLMNO
19	Método Engenharia¹	SP	331,601	-	100	-	PQRSTUV
20	ICEC	SP	309,678	-	100	-	DHIJKMPQRSTUV
21	Santa Bárbara	MG	309,387	55	45	-	AOPQRT
22	Barbosa Mello	MG	305,270	70	30	-	ABCEIJKMNO
23	Schahin Engenharia	SP	294,902	42	58	-	BLNOPQRSTUV
24	Via Engenharia	DF	293,343	53	8	39	ACIJMO
25	Trisul	SP	291,686	-	100	-	PQRS
26	Rossi Residencial	SP	269,649	-	-	100	RS
27	C.R. Almeida Engenharia de Obras	PR	261,174	95	5	-	ABCDEIJKMO
28	Fidens Engenharia	MG	241,199	84	16	-	ABCEIJO
29	Azevedo & Travassos	SP	224,356	-	100	-	ABCEIJKMO
30	S. A. Paulista	SP	220,677	100	-	-	ABCEIJO
31	Toniolo, Busnello	RS	207,881	28	72	-	ABCEIJMO
32	Construtora Artepa	MG	197,942	100	-	-	ABEIJOPQSU
33	Direcional Engenharia	MG	195,545	4	1	95	PQ
34	U&M Mineração e Construção	MG	187,943	-	100	-	ABDEJO

Table 28 Brazil's 50 largest contractors

Ranking 2010	Company	State	Gross revenue US\$ x 1,000	% of revenue from government*	% of revenue from private sector*	% of revenue from real estate projects*	Activity
35	Mascarenhas Barbosa Roscoe ¹	MG	183,710	-	100	-	ABHQOTU
36	Company	SP	182,261	-	-	-	PQRSUV
37	ARG	MG	175,289	30	70	-	ABCDEIJKOPQRST
38	EMSA	GO	165,136	96	4	-	ABCEIJKMNO
39	Construtora Triunfo	SP	146,095	-	-	-	ABCDEIJKO
40	Construtora Cowan	MG	142,221	83	17	-	ABCEIJKMO
41	Grupo Thá	PR	140,424	-	-	-	AIJOPQRSTUV
42	Gomes Lourenço	SP	134,459	70	30	-	ABCIMNOPT
43	Leão Engenharia	SP	132,404	25	75	-	ABIJO
44	Paranasa Engenharia	MG	131,705	-	100	-	CDHIJNOPQRSTUV
45	Racional Engenharia ¹	SP	129,250	4	96	-	QTUV
46	Marquise	CE	125,757	98	-	2	PQRSV
47	Construtora Sucesso	PI	124,600	-	-	-	AINOPQSU
48	Constran	SP	117,900	100	-	-	ABCDEIJKMNO
49	J. Malucelli Construtora	PR	116,613	75	25	-	ABCO
50	Camter	MG	113,303	94	6	-	ABEIJNOST

Table 28 Key

A	Highways	L	Telecommunications
B	Hydroelectric Plants/Dams	M	Subway
C	Tunnels	N	Power Transmission Lines
D	Ports	O	Water & Sewerage
E	Railways	P	Residential Buildings
F	Nuclear Power Plants	Q	Office Buildings
G	Offshore Platforms	R	Horizontal Condos
H	Petroleum and Petrochemical Plant	S	Real Estate Projects
I	Bridges & Viaducts	T	Industrial Plants
J	Airports	U	Shopping Malls
K	Pipelines	V	Hotels

Table 29 Key

A	Highways	H	Offshore Platforms	O	Shopping Malls
B	Hydroelectric Plants/Dams	I	Petroleum and Petrochemical Plant	P	steel mills
C	Power Transmission lines	J	Bridges & Viaducts	Q	Industrial Facilities Projects
D	Water & Sewerage	K	Airports	R	Construction Management
E	Ports	L	Pipelines	S	Feasibility studies
F	Railways	M	Telecommunications	T	Architecture Design
G	Nuclear Power Plants	N	Subway	U	Urban Planning Airports

Table 29 Brazil's 15 largest engineering companies

Ranking 2010	Company	State	Gross revenue x 1,000BRL	Gross revenue US\$ x 1,000	% revenue from engineering	% revenue from construction management	% revenue from architecture design	% revenue from other activities	Employees	Activity
1	Engenix Engenharia	SP	1,467,309	734,543	11	10	-	79	2,630	ABCEDEFGHUKLMNPORSTU
2	Promon Engenharia	SP	607,728	304,232	30	20	-	50	844	BCDEFGHIKLMNOPORSU
3	Concremat Engenharia	RJ	532,477	266,561	29	46	4	21	2,976	ABCDEFLKLMNOPQ
4	Cnec Engenharia	SP	373,292	186,872	90	10	-	-	590	ABCEDEFGHUKLMNPORSTU
5	Techip Brasil	RJ	270,912	135,620	10	90	-	-	1,054	-
6	Logos Engenharia	SP	250,201	125,252	-	71	-	29	870	ABDEFGJLMNOPORS
7	Tecosolo	RJ	181,057	90,638	27	36	3	34	1,049	ABDEFJKLNOPRSTU
8	Mireconsult Engenharia	MG	178,982	89,599	80	20	-	-	926	CEDEFJOPRST
9	Progen - Projetos e Gerenciamento	SP	177,155	88,685	73	27	-	-	1,600	HIMPQRS
10	Leme Engenharia	MG	174,588	87,400	40	60	-	-	821	BCDQKQRS
11	Projectus Engenharia	SP	139,634	69,901	75	25	-	-	800	ABCEDEFGHUKLMNPQRSTU
12	Genpro Engenharia	SP	126,247	63,200	75	20	5	-	673	EHILPQRST
13	ATP	PE	116,701	58,421	-	-	-	-	-	-
14	Duotor	SP	106,832	53,481	5	85	-	10	800	ADEFJNR
15	EPC Engenharia	MG	102,748	51,436	59	40	-	1	1,050	BCDEFJUNPORST

Table 30 Main taxes in Brazil, International Bar Association

Brazilian name	Common name or acronym	Rough translation	Taxing authority Federal, F State, S Municipal, M	Calculated on	Rate
Imposto de renda pessoa jurídica	IRPJ	Corporate income tax	F	Profit, whether presumed or calculated	15%
Adicional de IRPJ	Adicional de IRPJ	Supplementary corporate income tax	F	Real profit, whether presumed or calculated	10% on profits over R\$240,000 PA
IR na fonte	IRF	Withholding income tax	F	Remittances for income and capital gains by nonresidents from Brazilian sources	15% or 25%
Imposto sobre produtos industrializados	IPI	Tax on industrialised products	F	Sale price at factory gate; or import price	Variable
Imposto sobre operações financeiras	IOF	Tax on financial operations	F	Credit, foreign exchange, insurance, stocks and bonds	Variable; 0% to 5.38%
Contribuição social sobre o lucro líquido	CSL	Social contribution on net profit	F	Adjusted net income	9% or 15%
Programa de integração social + programa de formação do patrimônio do servidor público	PIS/PASEP	Social integration program	F	Gross monthly billing; also imports	0.65% and 1.65%
Contribuição para financiamento da seguridade social	COFINS	Social security	F	Gross monthly billing; also imports	3%, 4% or 7.6%
Contribuição de intervenção no domínio econômico	CIDE	Earmarked tax	F	Varies (eg. fuel, use of foreign technology, trademarks and patents)	Varies
Imposto sobre circulação de mercadorias e serviços	ICMS	Tax on circulation of goods and services ¹ , effectively equivalent to VAT in the UK	S	Transfer value	Varies by state and category; 7% to 33%
Imposto sobre serviços	ISS	Service tax	M	Billing price of service	Varies by municipality and category; 2% to 5%
Imposto sobre importação	II	Import tax	F	CIF value	0% to 35%
Imposto sobre exportação	IE	Export tax	F	FOB value	Most items 0%, usually 30% when applied; limit is 150%
Imposto sobre a transmissão de bens imóveis	ITBI	Property sales tax	M	Fair market value	Up to 4%
Imposto sobre a propriedade predial e territorial urbana	IPTU	Council tax	M	Fair market value	Varies by municipality; up to 1.5% in São Paulo

The contents of this annex should be read in conjunction with “Major Sporting Events in Brazil - Business Opportunities and the Legal Framework”, a briefing booklet published by the International Bar Association, which is recommended reading for companies wishing to invest in the Brazilian market.

Taxes

Taxes are levied by the three levels of Brazilian government, as follows:

- Federal Government
 - Personal and company income
 - Profit
 - Production
 - Imports
 - Exports
 - Capital gains
 - Rural property
- State Governments
 - Motor vehicles
 - Movement of goods

- Donations
- Inheritance
- Municipal Governments
 - Services
 - Urban property
 - Property sales.

The International Bar Association considers the Brazilian tax burden, at 35.3% of GDP, high for a developing country, but low when compared with developed countries. It compares with 37.9% in the UK.

Brazil has no double taxation agreement with the UK, but a Brazilian company can usually claim a credit against Brazilian corporate income tax paid by its foreign operations, up to the limit of the tax that would be due in Brazil on the same income.

Income paid by Brazilian companies to foreign companies or individuals is subject to a 15% withholding tax.

Capital gains by companies established in Brazil are treated as taxable, and taxed at a rate of 15% withholding tax. This may raise to 25% when a company is located in a tax haven.

The following tables describe briefly the main taxes and payroll expenses companies operating in Brazil should reckon with.

Table 31 Main payroll charges, International Bar Association

Main payroll charges					
Seguridade social	INSS	Social security	F	Total wage bill	20%
Seguro acidente de trabalho	SAT	Workers' accident insurance	F	Total wage bill	1%, 2% or 3%, depending on activity
Sistema S	Deductions for various social services	F	Total wage bill	3% or 3.3%	
Salário-educação	SE	Education allowance	F	Total wage bill	2.5%
Fundo de Garantia por Tempo de Serviço	FGTS	Unemployment compensation fund	F	Total wage bill	8%

Table 32 Main employee tax, International Bar Association

Main employee deductions					
Imposto de renda pessoa física	IRPF	Personal income tax	F	Earned income	15%, 22.5%, 27.5%
Seguridade social	INSS	Social security	F	Monthly salary up to R\$3,416	8% up to 11%

The author thanks the following organisations for their contribution to this research:

- ABIH - Brazilian Hotel Industry Association
- Andrade Gutierrez - Contractor
- BDSP Partnership - Engineering firm
- Bernardes + Jacobsen Arquitetos - Architecture firm
- BHG, Brazil Hospitality Group - Hotel operator
- BNDES - National Bank for Economic and Social Development
- Carioca Christiani Nielsen - Contractor
- CCS, Centro de Construção Sustentável - Centre for Sustainable Construction
- Construtora Norberto Odebrecht - Contractor
- EGP Rio - Olympic project management office for the State of Rio de Janeiro
- Green Building Council of Brazil - LEED certifier
- Engevix - Engineering firm
- Indio da Costa AUDT - Architecture firm
- Instituto Pereira Passos - Urban planning department of the Municipality of Rio de Janeiro
- Marriott - Hotel operator
- Mendes Junior - Contractor
- Metrô Rio - Concessionaire for Lines 1 and 2 of Rio metro
- PiniWeb - Publisher
- Piratininga Arquitetos Associados - Architecture firm
- Promon - Engineering firm
- PwC, PricewaterhouseCoopers - Management consultants
- Ricardo Julião Arquitetos - Architecture firm
- Rio 2014-2016 - Olympics and World Cup project management office, Municipality of Rio de Janeiro
- Rio 2016 - local organising committee of the 2016 Olympic Games
- SEDEIS - Rio de Janeiro State Secretariat for Economic Development, Energy, Industry and Commerce

- SINAENCO - National Syndicate of Architects and Consulting Engineers
- SINDUSCON - Syndicate for the Construction Industry
- SMT Rio - Municipal Secretariat for Transport, Municipality of Rio de Janeiro

Useful websites which should be consulted in addition to this report and are sources of relevant information for the construction industry are:

- PiniWeb, a São Paulo-based news website with up-to-date information on several areas of the construction industry. In Portuguese only
www.piniweb.com.br
- IAB RJ, the website of the Rio chapter of the Brazilian Institute of Architects. Information on all competitions the IAB supports or promotes is published regularly. In Portuguese only
www.iabrj.org.br
- Portal do Brasil, the web portal of the Brazilian Government, with information about government initiatives and programmes, including the Accelerated Growth Programme (PAC). In Portuguese and English
www.brasil.gov.br
- O Globo, Rio de Janeiro's main daily newspaper. In Portuguese only
www.oglobo.globo.com
- ABDIB, the Brazilian Association of the Infrastructure Industry. In Portuguese and English
www.abdib.org.br
- Rio 2016, Local Organising Committee of the Rio 2016 Olympic Games. In Portuguese and English
www.rio2016.com.br
- INFRAERO - National airport operator. Information on public tenders for airport work throughout the country. In Portuguese only
www.infraero.gov.br
- BNDES - National Bank for Economic and Social Development. In Portuguese and English
www.bndes.gov.br
- Valor Economico, Brazil's main finance newspaper. In Portuguese only
www.valoronline.com.br

- Revista Exame, business journal. In Portuguese only exame.abril.com.br
- CBIC - Brazilian Construction Industry Chamber. Publishes data, surveys and sector studies of the construction industry in the country. In Portuguese only www.cbicdados.com.br

Publications that complement the information in this report are:

- "Game on - Progress in Brazil's preparations for the 2014 FIFA World Cup", a UKTI report published June 2011
- "It's all to play for - Infrastructure Opportunities in Brazil: FIFA World Cup 2014", a UKTI report on the opportunities created by the World Cup 2014 in Brazil
- "Major Sporting Events in Brazil: Business Opportunities and the Legal Framework", a briefing booklet from the International Bar Association available at www.ibanet.org
- "VITRINE OU VIDRAÇA. Desafios do Brasil para a Copa de 2014", a report published by SINAENCO about the challenges Brazil faces to host the 2014 World Cup available at www.sinaenco.com.br
- "Brazil Business Guide", an introduction to doing business in Brazil published by UKTI
- "Construção Civil: Análises e Perspectivas", an overview of the construction market by CBIC available at www.cbicdados.com.br/files/textos/063.pdf
- "500 Grandes da Construção" an annual ranking of construction companies by magazine "O Empreiteiro". 2010 edition available in Portuguese and English at www.revistaempreiteiro.com.br/Ranking_Completo_2010.pdf

Websites that publish public tenders are:

- INFRAERO - National Airport Agency. Information on public tenders for airport work throughout the country www.infraero.gov.br
- Diário Oficial da União - national portal, with information on tenders released by the federal government portal.in.gov.br
- Tender portal of the State of Rio de Janeiro, with information on tenders released by all state departments www.governo.rj.gov.br/licitacoes.asp
- Diário Oficial Journal of the municipality of Rio de Janeiro, with information on municipal tenders www.doweb.rio.rj.gov.br

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Endnotes

- 1 IBGE, Brazilian Institute of Geography and Statistics, http://www.fazenda.gov.br/spe/publicacoes/conjuntura/informativo_economico/2010/2010_12/outros/IE%202010%2012%2009%20PIB%203%C2%BA%20trimestre%202010.pdf
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