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Bosnia and Herzegovina

Infrastructure and Energy Strategy

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Abbreviations & Acronyms

BiH	Bosnia and Herzegovina
DPA	Dayton Peace Accords
EBRD	European Bank for Reconstruction and Development
EPBiH	Electroprivreda BiH
EPHZHB	Electroprivreda Hrvatske Zajednice Herceg-Bosne
EPRS	Electroprivreda Republika Srpska
EU	European Union
ISO	Independent System Operator
KM	Konvertible Marka
LSMS	Living Standards Measurements Survey
OHR	Office of the High Representative
PRSP	Poverty Reduction Strategy Paper
RS	Republika Srpska
SECAL	Sectoral Adjustment Loan
SEEREM	South East Europe Regional Energy Market
USD	United States Dollars

Exchange Rates (mid-2003)

US\$1 = KM 1.72

KM1 = US\$ 0.58

Euro 1 = KM 1.95

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IBRD32760	Administrative boundaries, main road and rail network
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IBRD33290	Gas transmission network

Preface

This report is an overview of Bosnia's infrastructure and energy sector development strategies, investment needs and financing options for the coming years. It is based on a review of the water, sanitation, solid waste, electricity, coal, gas, district heating, roads and rail sectors that make up a second (unpublished) volume. This can be obtained on request from Ms. Yukari Tsuchiya (ytsuchiya@worldbank.org).

Priority investment requirements for these sectors for the five-year period from 2003-2007 are estimated to be about USD 2.4 billion. Despite assuming generous government budget contributions and self-financing by sector enterprises, there is still a financing gap of about USD 1.3 billion. In other words, expected financing will cover less than half of the priority investment needs. Private investor interest in emerging market infrastructure has dramatically shrunk, and BiH is poorly placed to attract investors due to the lack of reforms and institutional preparedness within the country. At the same time, donors are scaling down their planned assistance to BiH overall, as well as in the infrastructure and energy sectors. This trend is extremely worrying. An indifferent commitment to fundamental institutional change and reform by the authorities cannot continue. Under these circumstances, lenders, investors and donors will not come forth with the financing and institutional support needed by BiH. Ultimately, the onus is on the authorities to implement reforms that would justify the continued large financial engagement by the international community in BiH.

The report was prepared in mid-2003 and discussed with government and the main donor agencies in Sarajevo in October 2003. The principal authors are Ranjit Lamech and Sunil Mathrani. Valuable contributions were received from Vesna Francic, Mirjana Karahasanovic, Iftikhar Khalil, Seema Manghee and Cesar Queroz. The comments and assistance of Jean-Luc Bernasconi, William Denning, Simon Gray, Ellen Hamilton, Enes Covrk, Selver Kelestura, Irina Smirnov, Richard Scurfield, Jordan Schwartz and Lee Travers is gratefully acknowledged. Ms. Yukari Tsuchiya edited and processed the report for publication.

Chapter 1.

The Strategic Context

1.1 Introduction and Objectives

The objectives of this infrastructure and energy strategy report are to:

- (a) Establish a comprehensive five-year perspective of the reform and investment priorities in Bosnia Herzegovina (BiH).
- (b) Provide a common platform for consultations between the Government and the international community on goals and strategies to address the investment and institutional priorities identified.
- (c) Support the preparation of the World Bank Group Country Assistance Strategy (CAS) for the period 2004 to 2007.

This work was originally initiated to develop strategies on how the World Bank and the Government could more effectively promote and support private sector participation in infrastructure and energy in BiH. However, as the work advanced it became apparent that the private sector role in providing incremental investment in the infrastructure and energy sectors would be extremely limited in the medium-term and that a broader perspective was essential.

Sectoral Coverage & Timeframe: The infrastructure and energy sectors reviewed in this report, are: water supply and sanitation, solid waste, electricity, coal, natural gas, district heating, roads and railways. These sectors were chosen for two reasons. First, the sectors noted provide essential public services that are both economically and socially important – some services deliver *basic* services such as heat, water and electricity. Sanitation and solid waste services are necessary for public health reasons. Roads and railways influence access to jobs, markets and broader social connectivity. Second, effective engagement by the Government is critical in these sectors both during the medium-term development transition, and over the long-term to regulate service delivery.

Organization of the Report: The Report is made up of five chapters and two annexes. The first chapter assesses the impact of the infrastructure and energy sectors on the economic and social development goals of BiH, and identifies sectoral priorities. A brief summary of the main conclusions of the report is also presented at the end of Chapter 1. The second chapter summarizes the key issues and strategic goals in each sector, the priority investment needs to achieve these goals, and the expected financing gap. Chapter 3 discusses the key financing and institutional challenges and the recommends strategies to address them. Chapter 4 outlines the institutional development steps that should be taken to successfully manage the reform transition. Chapter 5 presents a prospective program for World Bank Group engagement in the infrastructure and energy sectors for the period from 2003-2007.

1.2 Linkages to Achieving the National Economic and Social Goals

The Government's central economic and social goal is to reduce poverty by a fifth by 2007, and to do so by achieving a sustainable, real annual economic growth rate of 5.0-5.5%.¹

To achieve the poverty reduction and growth goal there are five areas where the performance of the infrastructure and energy sectors have an important influence:

- ⌚ Maintaining fiscally sustainable services
- ⌚ Service quality to households and business
- ⌚ Impact on livelihoods and the poor
- ⌚ Creating a *single economic space* within BiH and integration with the EU
- ⌚ Mitigating environmental risks

Assessing the performance and risks of the infrastructure and energy sectors along the above dimensions reveals the priorities for future investment and institutional development.

Maintaining Fiscally Sustainable Services

Public support either through direct financing or guarantees can often be economically justified to develop key infrastructure and public services projects. However, the operating costs and other inefficiencies in the delivery of infrastructure and energy services cannot continue imposing a large, recurring cost on the economy without undermining macroeconomic performance. The economy faces extremely tight fiscal spending constraints owing to its adherence to the Currency Board, and the inability to increase taxes much further. It is in the context of current expenditure limitations that the direct and indirect subsidies to the railways and coal sector need to be addressed. The railways sector receives on the order of KM 40 million annually in direct subsidies to meet operating costs. Its own revenues do not even cover its wage bill. The coal sector receives about KM 30 million per year to meet its pension obligations and for direct operating subsidies. In the case of the RS railways, the financial support is provided "off-budget" through an earmarked sales tax levy.

Although the other infrastructure and energy sectors such as water and sanitation, roads and on occasion electricity, receive budgetary or off-budget subsidies from the government, these are not as serious as the impact of the railways and coal sector². The railway and coal sector subsidies alone represent about 1.2% of Government expenditure – which is a very substantial amount – and this does not even allow the rail and coal sector to be able to finance investments or undertake regular maintenance.

These costs will only continue increasing to unsustainable levels unless action is taken to fundamentally restructure these sectors. In addition to institutional changes, investments will be required to restore both the railway and coal sectors to a basic level of operational viability, service delivery, and competitiveness. Large capacity reductions on the order of 60% are required in the coal sector and possibly as much in the railways – with coal production having gone down to about 7.5 million tons from 18 million tons pre-conflict production level, and freight

¹ Mid-term Development Strategy of BiH (PRSP), 2004-2007, March 2004.

² There are several cases of subsidies/transfers to Municipal (and Cantonal) utilities – however, the issue here is often one Municipal governments partially meeting the payment obligations of other arms of the government.

and passenger volumes having shrunk by over 80%. Capacity rationalization will require staff reductions and programs for mitigating the social costs should be designed and implemented, particularly in the case of areas heavily reliant on a single activity like mining.

Service Quality

At a very superficial level, there are no glaring infrastructure and energy service bottlenecks in BiH – electricity services are quite reliable, some road congestion exists around major cities but travel times are not unacceptable, most citizens have access to piped water supply although shortages are common in most cities. The problem is however far more insidious – it is one of degrading asset quality and value owing to foregone maintenance and other essential spending to preserve the infrastructure base. Although the post-conflict reconstruction effort was successful in largely restoring essential services, there remains a huge backlog of essential maintenance and an unfinished rehabilitation agenda. Investments are just not occurring at the scale and rate they should. Across the economy, gross investment averages about 20% of GDP in contrast to a typical average of about 25-30% for transition countries.

A few examples noted below, show how the degradation in physical infrastructure has led to service quality dropping sharply. This imposes a huge risk on the continued reliability of service. In some instances, such as railways, the poor quality of the rail infrastructure has been a factor in undermining the commercial viability of the service.

- ⌚ Water Supply –The unaccounted for water is in excess of 55% on average. A reasonable benchmark for unaccounted for water in Western Europe and also other (post)-transition countries like Poland and Chile is about 15-30%. In Albania unaccounted for water is 45%. Normal periodic maintenance is not done and the aging system is degrading rapidly. Owing to the high water loss, most cities are not able to provide regular supply with the existing storage and pumping systems. In a sample of 17 municipal water utilities less than 50% had reliable 24-hour service.³
- ⌚ Electricity – On a cash basis the sector makes operating profits. However, once depreciation is added it makes a very large loss. Effectively only 30% of depreciation is covered by revenues. This is leading to a very large maintenance overhang and asset degradation that is manifested in terms of system losses of about 20% on average – with EPHZHB and EPRS averaging about 27%. The comparable loss level for the EU is about 12%. System upgrades are essential to reduce losses and ensure supply reliability.
- ⌚ District Heating – Of the over 20 district heating systems in Bosnia, only about the Sarajevo system has been reasonably rehabilitated and overhauled in the last decade. Other such as Tuzla, Doboje and Banja Luka, have merely had some “band-aid” rehabilitation done. With the exception of Sarajevo, virtually all of the other district heating systems suffer high energy losses – which in many cases exceed 60%. Reduction in these losses can help restore the viability of these systems while improving service and air quality. The district heating sector also represents a lost opportunity to deliver heat and hot water services to a greater number of urban consumers – who now rely heavily on dirtier fuels.
- ⌚ Roads – Urgent repairs are needed on 10% of the main road network which accounts for 20% of the total road network in Bosnia – and where much of the reconstruction effort was focused. The condition of regional and local roads, which account for the remaining 80% of the total network in BiH is far worse.

³ OED Survey of Municipal Water Utilities, June 2003.

The road network in Bosnia has seen a 25% increase in the number of vehicles compared to the pre-conflict period in 1990, a more than doubling of freight and a 50% increase in passenger traffic since 1996. The increase in traffic has been accommodated on a network that has not been expanded. Traffic bottlenecks are emerging in some regions and upgrades in the network are required.

- ⌚ **Railways** – About 70% of the track network is in need of major rehabilitation. Speed restrictions for safety reasons range from 30 to 60 km/hr thereby affecting the quality of service which has led to a massive shift to road transport. Although much of the freight and passenger traffic that has shifted away from rail may not return⁴, there is a need to upgrade the track infrastructure to maintain a viable network on key routes.

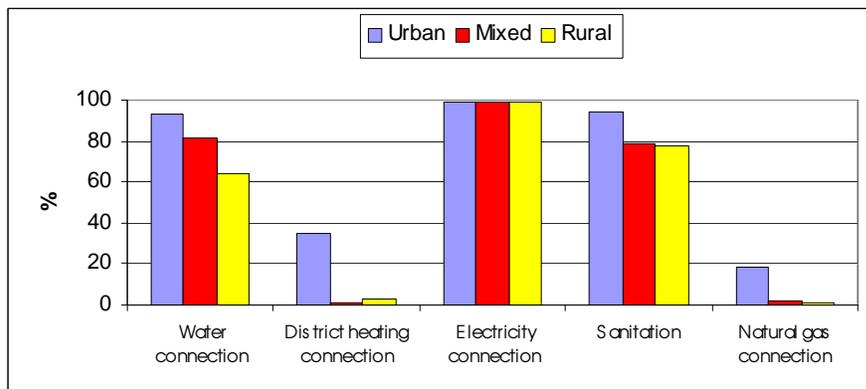
The pattern of degrading infrastructure owing to inadequate provision for maintenance is prevalent to some extent in all infrastructure and energy sectors. The problem stems from inadequate cost recovery through tariffs. However, the sheer scale of the investment backlog that cannot be addressed by merely raising tariffs. These problems need to be addressed quickly to prevent what could eventually become serious service shortcomings that impact job-creation and the overall attractiveness of BiH as an investment destination.

Livelihoods and the Poor

The baseline poverty incidence in BiH is about 20%, however poverty rates vary widely by type of settlement and location. The poverty rate is highest in mixed areas (24%) and lowest in urban areas (14%) with rural areas (20%) falling in between. Regionally, the RS has a much higher rate of poverty (25%) than does FbiH (16%). If one looks at where the poor live, then nearly half (48%) of the poor are found in RS, despite its much smaller size. Poverty is highly concentrated among internally displaced persons and refugees, households with children, the unemployed and the uneducated, and the Roma. The social protection system is weak and provides only limited assistance to the lower income groups.

Despite generally high access rates to basic infrastructure services, access rates vary by settlement type as Figure 1.1 shows. As one would expect, urban residents are most likely to have access to network services and rural residents the least. However, one should interpret the rural figure with caution since rural households who are not connected to running water may still have an acceptable water source and district heating is never a viable heating source for rural households.

Figure 1.1 Household Connections to Network Infrastructure by Settlement Type



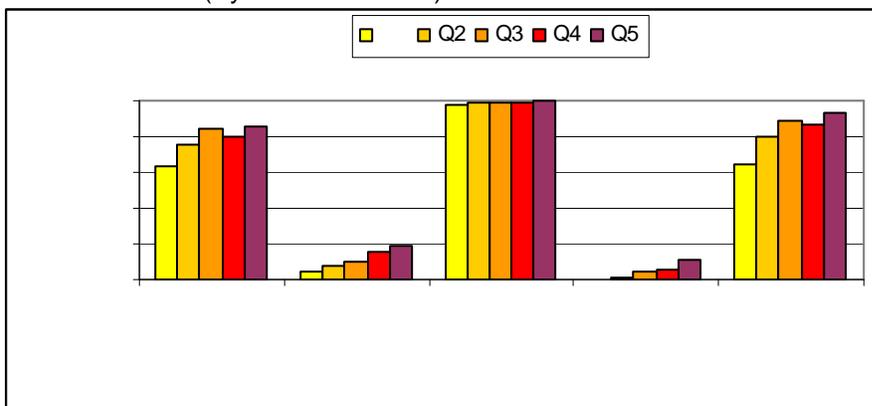
Source: LSMS 2001

⁴ Freight traffic has now bottomed out and is likely to rise somewhat as a result of government decisions to make fuel imports by rail mandatory.

Access to similar types of settlements, access varies by consumption quintile with poorer households having less access, as shown in figure 1.2.

In addition, service quality is eroding. In terms of electricity, 13% of households surveyed did not have electricity for 24 hours each day, while for water this figure was 20%. Without access to district heating or natural gas, four-fifths of households report using kerosene, coal or other solid fuels for heating or cooking.

Figure 1.2 Household Connections to Network Infrastructure by Settlement Type (By Income Quintile)



Source: LSMS 2001

The problem from the perspective of poverty reduction in Bosnia is twofold. First, there is an issue of expenditure levels to meet certain basic public utility needs. Second, is the problem of access to transport that local community surveys indicate are high priorities.

Household spending on basic infrastructure services, specifically water, electricity, heating and other energy services is a very large share of expenditures for the lowest income brackets (or quintiles). Spending on these services ranges from 17% of consumption during winter months for the poorest quintile to about 13% for the wealthiest quintile – the corresponding percentages during non-winter months is 10% and 8%. The average per capita spending in KM during winter months is summarized in Table 1.1.

Table 1.1 Per Capita Expenditures on Essential Infrastructure and Energy Services (in KM/month – during winter months)

Income Quintile <i>Expenditure</i>	Water	Electricity	Gas	Wood	Coal	District Heating
Quintile 1 (1,872 KM/yr)	1.02	7.56	0.15	15.66	1.28	0.31
Quintile 2 (2,795 KM/yr)	1.93	10.76	0.43	18.25	2.84	0.88
Quintile 3 (3,577 KM/yr)	2.56	13.84	1.13	20.43	2.64	1.37
Quintile 4 (4,595 KM/yr)	3.16	17.32	1.84	24.46	3.70	3.4
Quintile 5 (7,648 KM/yr)	4.55	30.97	6.42	32.00	4.69	6.37

Source: LSMS 2001

The principal issues with regard to livelihoods and impact on the poor are as follows:

- ⌚ Water Supply – Almost a third of the poor (in the lowest quintile) have to fetch water to their homes. Both the urban and rural poor show particularly low rates of access with the bottom quintile in urban areas having a marginally lower rate of household access at about 65%.
- ⌚ Roads – There is widespread dissatisfaction amongst the population about the quality of local (i.e. municipal and regional) roads. Complaints about the low quality of roads top the list among all public services⁵ – complaints being almost twice as high as the next priority/problem which includes concerns about security, public transport, water supply and sanitation. The priority would be local road upgrading and development – in some sense shifting from the current predominant focus on motorways and main roads.
- ⌚ Fuels for Cooking and Heating – The usage of wood as a fuel predominantly for heating is extremely high in Bosnia – across all income quintiles. The lowest income quintiles spend almost twice the amount on wood as they do on other essential services, as shown in table 1.1. While there are no identifiable health impacts from the heavy reliance on wood fuels, its high cost is a burden and there is a clearly a negative impact on the environment. The priority here would be to strengthen district heating systems and expand access to gas – at least in urban areas.

Creating a Single Economic Space within BiH

The creation of a single economic space within BiH and the harmonization of its economic policies with those of the European Union are two overriding themes of BiH's political economy. Reforms in infrastructure and energy sectors, particularly electricity, gas, and railways are essential to these endeavors. BiH pays a heavy economic price for the fragmentation of network infrastructure between Entities and the associated proliferation of government oversight and coordination agencies. Such fragmentation also works against improving financial viability and raising the investment resources that are badly required.

The institutional restructuring that is essential to improving efficiency and economic performance, also presents an opportunity to harmonize policies with those of the EU, as recommended by the European Commission Feasibility Study⁶. The integration with the South East Europe Regional Energy Market (SEEREM), for example, presents opportunities for Bosnia to benefit from an expansion in cross-border trade in electricity. In both the electricity and gas sectors it would be important to work towards the creation of unitary network infrastructure companies and consolidate regulatory responsibilities to ensure coordinated oversight of investment, market access and application of rules.

The current fragmentation of enterprises in electricity, gas and railways, is partially an outcome of the decentralized political, administrative, and fiscal structure of the BiH government(s) established by the Dayton Peace Accord (DPA). Progress towards the goal of creating a single economic space in BiH and integration with the EU will require a fundamental change in the interpretation and application of the principles in the DPA with regard to infrastructure responsibilities. Although the consensus of the DPA and its implications for the role of the State and Entity governments remains a framework that must be accepted for the medium-term – it does not have to prevent the formation of more cohesive companies in the infrastructure and

⁵ Local Level Institutions and Social Capital Study, World Bank Report No. 26404, (2002).

⁶ Among the 16 priority reforms necessary for BiH to begin negotiations for a Stabilization and Association Agreement with the EU is the integration of the electricity market by, inter alia, establishing a single State regulatory body and passing legislation setting up an ISO and Transco.

energy sectors, nor the establishment of coordinated government oversight mechanisms that would preserve the rights of the Entities. After all, the decentralized government structure created by the DPA was designed to promote political stability and democratic representation in the decision-making process, and not to fragment infrastructure and energy service delivery companies and oversight along Entity lines as an outcome in itself.

It must be emphasized that the imperative for consolidation is economic – not political. First, there are important operating efficiency gains that can be achieved from consolidation. Second, without consolidation, the economic and financial justification for engagement by lenders, investors and donors is extremely weak.

Mitigating Environmental Risks

There are three main environmental risks and mitigation priorities in the BiH:

- ⌚ Waste Water Treatment – About two thirds of BiH's water courses⁷ are reported to be polluted, in part due to lack of treatment of sewage. Just 5% of wastewater is treated prior to discharge into public water bodies. Virtually all municipalities discharge collected sewage directly to a surface water channel or a river. Only six municipalities in the Federation have wastewater treatment plants, of which four are not currently operating. In the RS there is only one functioning wastewater facility.
- ⌚ Solid Waste – The disposal of solid wastes is a major environmental issue in BiH. BiH generates approximately 2 to 3 million tons per year in total of solid waste of all categories. Waste generation growth rates are estimated at 3-5% per year. There are only a handful of sanitary landfills in the country and large amounts of solid waste are illegally dumped in unofficial sites (known as "wild dumps sites") along roadsides and in disused quarries and riverbeds, posing a direct risk to public health. There are over 1,100 such wild dump sites. The risk of greatest concern is the contamination of ground water supplies, which most of the population relies on, due to seepage of toxic liquids (called leachate) from solid waste dumps.
- ⌚ Gas Penetration – The population of BiH has an extremely high reliance on wood fuels. Gas penetration is an opportunity for BiH to provide a clean fuel alternative to the population. The current utilization of gas in BiH is less than a quarter of the potential capacity of the main gas pipeline into the country. Several measures would be required to make gas competitive, including closer regulation of gas prices and reforms to achieve a more coordinated national gas development strategy.

⁷ Investigations in 1988 on 56 sections of watercourses found that water quality did not meet standards in 36 cases. Source: Danojevic & Slipicevic, Environmental Health Priorities, Health Policy and Poverty Reduction, June 2002.

1.3 Establishing Sectoral Priorities

Based on their impact on the national economic and social goals reviewed above, the sectoral priorities identified are summarized in table 1.2 below.

Table 1.2 Infrastructure and Energy Sector Priorities

	Achieving Fiscal Sustainability	Improving Service Quality	Livelihoods & Poor	Single Economic Space	Mitigating Environmental Risks
Water Supply		High			
Sanitation					High
Solid Waste					High
Electricity		High		High	
Coal	High				
Gas				High	High
District Heating		High	High		
Roads		High	High		
Railways	High			High	

1.4 Main Conclusions of the Infrastructure and Energy Review

The remaining three chapters of the report are devoted to analyzing the main problems and challenges in each of the infrastructure and energy sectors and the possible strategies to respond to the identified priorities.

The main conclusions of the report are briefly stated below:

- ⌚ The coal and railway sectors are not financially viable given their huge overcapacity. These two sectors have a fiscally unsustainable impact – requiring public support in excess of 1.2% of government expenditure to barely meet administrative costs. Restructuring and modernization of these two sectors is critical.
- ⌚ The service quality in water and sanitation, electricity, district heating and roads is deteriorating. These sectors are approaching a crisis in their ability to meet demand reliably. A slowdown in infrastructure spending in these sectors would pose significant risks to growth and living standards.
- ⌚ Household spending on fuels for heating, particularly on woodfuels is extremely high. District heating systems need to be expanded to deliver services to more consumers, and markets for cleaner alternatives such as gas need to be developed.
- ⌚ Priority investment requirements for the five-year period from 2003-2007 are estimated to be about USD 2.4 billion. This estimate covers only a small portion of the proposed Corridor-Vc motorway and excludes investments in electricity

generation to increase electricity exports, which are difficult to justify on economic grounds without a more detailed analysis of demand. Also excluded from the priority investment estimate are environmental upgrades for power stations to meet EU-standards, and in waste-water treatment plants (apart from in Sarajevo). Despite these exclusions, and assuming generous government budget contributions and self-financing, there is still a financing gap of about USD 1.3 billion. In other words, expected financing will cover less than half of the priority investment needs.

- ⌚ The currently estimated prudent private and public external borrowing limit for investment purposes for the next five years is about USD 650 million. This will be the most critical constraint in attempting to bridge the investment financing gap in infrastructure and energy. These limits may be marginally increased with improved economic performance. More selectivity and prioritization of the investments would be essential.
- ⌚ Although private investment in infrastructure is essential to achieve long-term fiscal sustainability – any medium-term expectations for substantial foreign or domestic private investment in the infrastructure and energy sectors have to be greatly moderated – primarily because private investor interest in emerging market infrastructure has dramatically shrunk, and due to the lack of reforms and institutional preparedness within BiH.
- ⌚ An indifferent commitment to fundamental institutional change and reform by the authorities cannot continue. Lenders, investors and donors will not respond to the financing and institutional support needs under these circumstances. Continued unwillingness by the Entity governments to address the economic inefficiencies resulting from fragmented network infrastructure firms between the two Entities will only detract further from addressing the investment needs. Revisiting the *interpretation* of the Dayton Peace Accord (DPA) in the Infrastructure and Energy Sectors should remain a key element of further consultations on strategic responses to the problems in the infrastructure and energy sectors.
- ⌚ Donors are scaling down their planned assistance to BiH overall, as well as in the infrastructure and energy sectors. This trend is extremely worrying. The international community should recognize that they will need to remain a key source of investment funds for BiH, even if on less concessional terms. A massive and abrupt reduction in international support risks jeopardizing gains already achieved, as well as stalling the pace of future reforms. Advice and technical assistance, however important, are insufficient to ensure that the present momentum is sustained. However, it needs to be emphasized that ultimately the onus will be on the authorities to implement reforms that would justify the continued financial engagement by the international community.

Chapter 2.

Principal Sector Issues & Strategic Goals

As a starting point to develop a coordinated response to the investment and institutional shortcomings in the infrastructure and energy sectors, it is important to have a consensus on the principal sector issues or problems and to establish a base-line of viable strategic goals or targets. This chapter outlines for each sector reviewed, the key issues and indicative strategic goals defined with sector experts in BiH. Thereafter, the investment needs in each sector are costed, based on achieving the strategic goals and finally the available financing of these investments is reviewed. More detailed analysis of each sector is contained in the unpublished background report⁸ that was the foundation for the analysis presented here.

	Principal Issues and Problems 2003	Strategic Goals/Targets 2007
1. Water Supply & Sanitation	<ul style="list-style-type: none"> - Poor financial performance owing to: <ul style="list-style-type: none"> - high water losses (up to 80% -- average of 55%) - poor collection (50% of billed consumption) - low tariffs. (increases of 70%-100% required to cover full costs). - Dilapidated infrastructure, leaking pipes – investment and maintenance backlog. - Priority funding needs in excess of sectoral cash generation, - Municipal councils tend to approve tariffs well below costs – and don't support collection enforcement , in part because of the lack of an adequate social protection system - 130 municipal water utilities in a country of 4 million is excessive. - Water quality not systematically monitored and standards not enforced. - 95% of waste water is not treated and discharged into water courses. 	<ul style="list-style-type: none"> - Reduce unaccounted for water by 10% (from average of 55% to 45%) - Expand coverage of public water utilities by regularizing illegal connections and informal systems⁹ - Reduce by a third the population that does not have access to public water supply – approximately 250,000 new connections (some from regularizing illegal connection). - Increase access to sewage systems – about 250,000 new connections. - State level environmental regulation and enforcement capacity to monitor water quality. - Establish a standardized, national rules-based tariff setting methodology for municipal utilities.

⁸ Available on request from ytsuchiya@worldbank.org.

⁹ In Zenica alone there are estimated to be over 200 piped-water supply systems outside the purview of the municipal public water utility. Many of these are believed to be informal systems that are illegally connected to the public system.

	Principal Issues and Problems 2003	Strategic Goals/Targets 2007
2. Solid Waste	<ul style="list-style-type: none"> - Waste collection services have coverage below 60% in larger urban municipalities and far lower in rural municipalities - Proliferation of uncontrolled and illegal dumping (1,100 wild dumps). This is mainly due to the lack of accessible sanitary landfills. - Contamination of groundwater suspected with typical dumpsites used by municipalities - Cost-recovery for services a problem in most municipalities, others not organized to provide the service. - Weak incentives at municipal level to deal with solid waste problem. 	<ul style="list-style-type: none"> - Achieve complete transition from illegal and unsanitary dumping to disposal in sanitary landfills or licensed sites. - Expand from current 4 regional landfills to a total of about 12 to service the solid waste disposal needs of the entire country. - Increase coverage of solid waste collection services – using private operators as successfully demonstrated in Zenica. - Establish National level environmental protection regulation and enforcement capacity to require Municipalities to address solid waste collection and disposal problem.
3. Electricity	<ul style="list-style-type: none"> - Poor commercial discipline – inadequate billing and financial management practices. - System losses high – average of over 20% nationwide, about 11% in EPBiH, 27% in EPRS and 24% for EPHZHB. - Need for distribution investments in the areas of returning refugees. - Investment and operational coordination weak owing to separation of network infrastructure and dispatch functions across three electricity companies. - Weak oversight of electricity companies by supervisory boards – internal financial controls inadequate. - Regulatory structure with multiple regulators cannot achieve credible and consistent regulation of the sector. - Close linkage of power generation to the coal sector. Economic fuel choices in sector constrained by policy to maintain coal as the dominant fuel for generation. 	<ul style="list-style-type: none"> - Improve distribution infrastructure and commercial performance to reduce loses to below 15% nationwide. - System operations and dispatch integrated through a single transmission company. - BiH electricity sector fully integrated into the South East Europe Regional Electricity Market (SEEREM). - Investment program in generation and transmission coordinated nationwide to yield lowest cost investment program. - Credible and capable electricity/energy regulatory agency in operation – preferably consolidated into single State-level agency. - Electricity sector able to access private capital markets and/or non-concessional sources of donor financing.
4. Coal	<ul style="list-style-type: none"> - Uneconomic/unviable mines requiring substantial modernization and rationalization to achieve economic viability. Overcapacity of about 60%. - Inefficiencies in the coal sector impose a burden on the electricity sector. Economic fuel choices in electricity 	<ul style="list-style-type: none"> - All mines in operation to produce coal at below the benchmark competitive price level of 4 KM/GJ. - Implement mine restructuring program that closes/rationalizes unviable mines and ensures adequate social protection of miners.

	Principal Issues and Problems 2003	Strategic Goals/Targets 2007
	<ul style="list-style-type: none"> - sector being constrained by - Social costs of rationalization the mining sector are very high leading to inertia/unwillingness to deal with the problem. - Sector unable to meet recurring pension liabilities and other non-wage costs. 	<ul style="list-style-type: none"> (To reach economic viability staff reduction in the Federation mines could be about 7,000). - Environmental rehabilitation undertaken at closed mines.
5. Gas	<ul style="list-style-type: none"> - Sector stagnating owing to organizational fragmentation across Entity lines. Large unexploited potential for gas utilization – the main gas pipeline into BiH can carry up to 2.4 BCM of gas against a current consumption of less than 0.5 BCM. - Wholesale gas prices (e.g. to Sarajevogas) are very high (US\$200/mcm) leading to constraints on market growth. A reasonable cost reflective wholesale price to Sarajevo should be at least 30% lower (about US\$ 140/mcm). - Tariff structure distorted unfairly penalizing district heating. 	<ul style="list-style-type: none"> - Growth in gas market by 100% by extending supply to 3-4 medium-sized cities that can be economically supplied by system extensions. - Consolidation of gas import and transmission across Entity lines into single State-level corporation. - Establish credible gas sector regulation at the State level to address pricing, access and system expansion issues.
6. District Heating	<ul style="list-style-type: none"> - Of the 25 DH systems in BiH only about 4 have had any overhauls, upgrades and rehabilitation done in the last decade. Overall the DH systems are in poor physical condition leading to high system losses costs. - Despite being a important municipal public service, the DH sector suffers from neglect by the municipalities and the Entity-level energy ministries. <ul style="list-style-type: none"> - No systematic information base on the DH sector outside the two big cities (Sarajevo and Banja Luka). - No regulatory oversight of the DH sector in the nation. As with other municipal services, DH companies belong to the municipalities, which tend to set tariffs well below costs with no concern for long-term degradation of the infrastructure. - Most systems lack capacity to meter consumers individually and/or allow them to control heat use. - Regulation of input fuel prices specifically gas puts DH companies at a disadvantage (e.g Sarajevo) – and could impact future economic 	<ul style="list-style-type: none"> - Implement program to improve the technical efficiency of DH systems – by completing rehabilitation and installing necessary controls. - Expand mandate of energy regulatory oversight (for electricity and gas) to cover the DH sector. - Extend coverage to new areas/buildings in those cities with rehabilitated DH systems. - Conversion of DH systems to natural gas in cities that will be connected to the gas network.

	Principal Issues and Problems 2003	Strategic Goals/Targets 2007
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expansions.

7. Roads	<ul style="list-style-type: none"> - Fragmentation of road maintenance responsibility into three levels in the Federation – Main (Entity-level); Regional (Cantonal); Local (Municipal) leading to lack of coordination on maintenance management. - Road maintenance at all levels is underfunded and formal revenue allocation mechanisms are not observed. Maintenance underfunding for: Federation main roads is about 35% (KM 20 mn.); RS main roads is about 20% (KM 12 mn.) . Shortage of qualified and experienced staff in the sector. - Narrow mandate of State government leads to excessive focus on expensive European road schemes and inadequate focus on conditions of regional and local roads. - 10% of main road network in need of urgent repairs. Condition of regional and local road which account for almost 80% of the network is far worse - Safety record is poor – accident rate of 5.6 per 10,000 vehicles is significantly higher than the level of industrialized countries. - Traffic volumes have increased by doubling of freight and 50% increase in passenger traffic since 1996 on same road network. 	<ul style="list-style-type: none"> - Ensuring that Road Fund revenues are fully disbursed automatically to maintenance organizations. - Establishing additional funding mechanisms for maintenance and new road projects through fuel/vehicle tax increases. - Rationalizing the multiple agencies involved in roads – State Ministry, Entity Ministries, BiH Road Infrastructure Corporation, Entity-level Road Directorates, Cantonal authorities in Federation. - Proposition: Cantonal road responsibilities to be consolidated in Federation Road Directorate. <ul style="list-style-type: none"> - Adoption of measures to increase the output of university graduates in civil/highway engineering and management. - Increased road user and private sector involvement or consultation in the formation of policy or decision-making in the sector.
8. Railways	<ul style="list-style-type: none"> - Rail track and rolling stock assets are badly degraded. - Freight and passenger volumes are about 25% of the pre-conflict levels. Future viability depends on increasing traffic, major rationalization and improvement of services, cost reductions and modernization of infrastructure. - Entity-wise separation of infrastructure and services is a critical constraint to have achieving viability of the railways in BiH. - Total subsidy to railways is in excess of KM 40 million – and yet the operating losses are about KM 70 	<ul style="list-style-type: none"> - Achieve break-even on an operating cost basis. - Plan and implement a railway restructuring program that leads to unification of rail infrastructure. (Consider consolidation of both Entity level rail companies into a single State-level holding corporation to facilitate meaningful rationalization of services and employees to create a viable national service). - Rehabilitate and modernize track infrastructure – acquire new rolling stock.

	Principal Issues and Problems 2003	Strategic Goals/Targets 2007
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million.

2.2 Investment Needs and Financing Gap

Table 2.2 summarizes the priority investment needs in each sector based on the indicative sectoral goals established for the period 2003-2007. The total for the eight sectors covered in this review amounts to US\$ 2,440 million. The assumptions on which the investment cost estimates are based are briefly stated below and shown in more detail in the tables in Annex I.

- (a) Water Supply– Approximately 250,000 new household connections (average 50,000 per annum). Reducing unaccounted for water by about 10% through a combination of system rehabilitation and upgrades, and regularizing illegal connections.
- (b) Sanitation – About 250,000 new household connections. Urban systems will have to be rehabilitated and upgraded to reach consumers and provide higher capacity collection for the increased sewage volumes. Not included in the investments in table 2.2 are investments in waste water treatment in the large urban centers¹⁰ outside Sarajevo which could exceed US\$ 150 million. Reducing sewage discharges into open water courses is an important, yet expensive, environmental priority that may have to be deferred.
- (c) Solid Waste – development of a nationwide network of about 12 new regional sanitary landfills and cleanup of illegal waste dumps. Four solid waste sites to be established (Sarajevo, Tuzla, Zenica, Banja Luka)
- (d) Electricity – To complete the rehabilitation of existing generation stations and transmission network. Transmission capacity and system upgrades will be required to better integrate with the South East European Regional Electricity Market. Distribution sector rehabilitation and extensions will be required to reduce losses, improve/extend supply in urban areas as well as rural areas where rehabilitation is yet incomplete. Environmental investments such as flue gas desulfurization in coal-burning plants have not been included, nor have investments in new generation capacity to serve export markets (with the exception of ongoing projects).
- (e) Coal – Modernizing and rationalizing the coal mines to reach a commercially sustainable production volume and cost level. There will be a large social cost associated with the rationalization of the workforce in these mines – specifically, for suitable early retirement packages and meeting future pension costs. Only a small social cost allowance has been accounted for in table 2.2.
- (f) Gas – Extending the gas supply network to industrial and urban centers where potential demand can be economically met. Cities such as Bijelina, Brcko, Tuzla, Dobo, and Banja Luka are likely to be commercially viable provided that

¹⁰ Banja Luka, Mostar, Tuzla, Zenica and eight other towns with populations between 70-100,000.

an adequate anchor demand from industry can be identified, and/or heating plants switch from other fuels to gas use.

- (g) District Heating – Maintenance backlog and rehabilitation of the networks to improve efficiency and reduce costs. Most systems (apart from Sarajevo) require substantial investments in the hot water conveyance network and in consumer controls and metering.
- (h) Roads – Rehabilitation and upgrading of sections of the main and regional road network and a portion of the Corridor Vc motorway have been retained in the priority list. Most of the road network at the local level remains the responsibility of the municipalities and these roads require substantial rehabilitation for which a majority of the municipalities lack resources.
- (i) Railways – Overhaul of key sections of track and upgrading of signaling systems, along with the acquisition of essential new rolling stock.

Table 2.2 Priority Investment Needs and Financing Gap, 2003-2007
(in USD millions)

	Investment Requirement	Internal Cash Generation	Government Budget ^A
Water Supply	100	-	45
Sanitation	90	-	30
Solid Waste	60	-	20
Electricity	740	220	-
Coal	340	40	70
Gas	325	65	-
District Heating	120	15	15
Roads	390	-	90
Railways	275	-	70
Total	2,440	340	340
Donor Contribution (estimated Table 3.1)	500		
Identified Financing	1,180		
Financing Gap	1,260		

^A The estimates assume higher levels of government budgetary contributions to investment than they historically have been.

Chapter 3.

Financing and Institutional Challenges

This chapter reviews the two main challenges facing the State and Entity governments of BiH in infrastructure and energy. The first challenge is to bridge the estimated USD 1.3 billion financing gap to meet priority investment needs. The second challenge is to overcome the inefficiencies that arise from fragmentation and decentralization of service firms and their oversight. Strategies to respond to these challenges are suggested.

3.1 Bridging the Financing Gap

The financing requirement for priority infrastructure and energy investments is about USD 2,440 million. As noted in chapter 2, currently only about USD 1,180 million has been identified using generous assumptions of donor financing and government budget contributions. There is an extremely large financing gap of about USD 1,260 million.

Understanding the Financing Constraints

Bridging the entire financing gap presently estimated to be about USD 1,260 million may not be feasible. The amount cannot be mobilized given the economic constraints linked to maintaining the currency board arrangement, limiting deficit financing, and the external debt-servicing capacity of the country. In addition donor financing has reached an important turning point and a sharp drop in donor support is expected in the coming years. Further prioritization will be necessary and the government will have to leverage its borrowing and guaranteeing capacity selectively. Each of the main financing constraints is reviewed below and schematically shown in figure 3.1.

- (a) **External Debt Limits and Government Guarantees** – Based on the macroeconomic constraints that BiH operates within, the total net external debt that BiH can be expected to incur for the period 2003-2007 is about USD 650 million¹¹. The net external debt amount can be assumed to be the ceiling (or limit) for total new debt that may be incurred by public or private borrowers for investment purposes. The actual disbursements of debt inflows would be higher, but this additional amount would be required to meet amortization (or refinancing) requirements of multilateral and other commercial creditors (i.e. Paris and London Clubs).

The external debt ceiling of USD 650 million is for the entire economy (i.e., all sectors – public or private) and comprises:

- About USD 420 million of Official Development Assistance (ODA) in the form of loans.
- About USD 230 million of Commercial Debt.

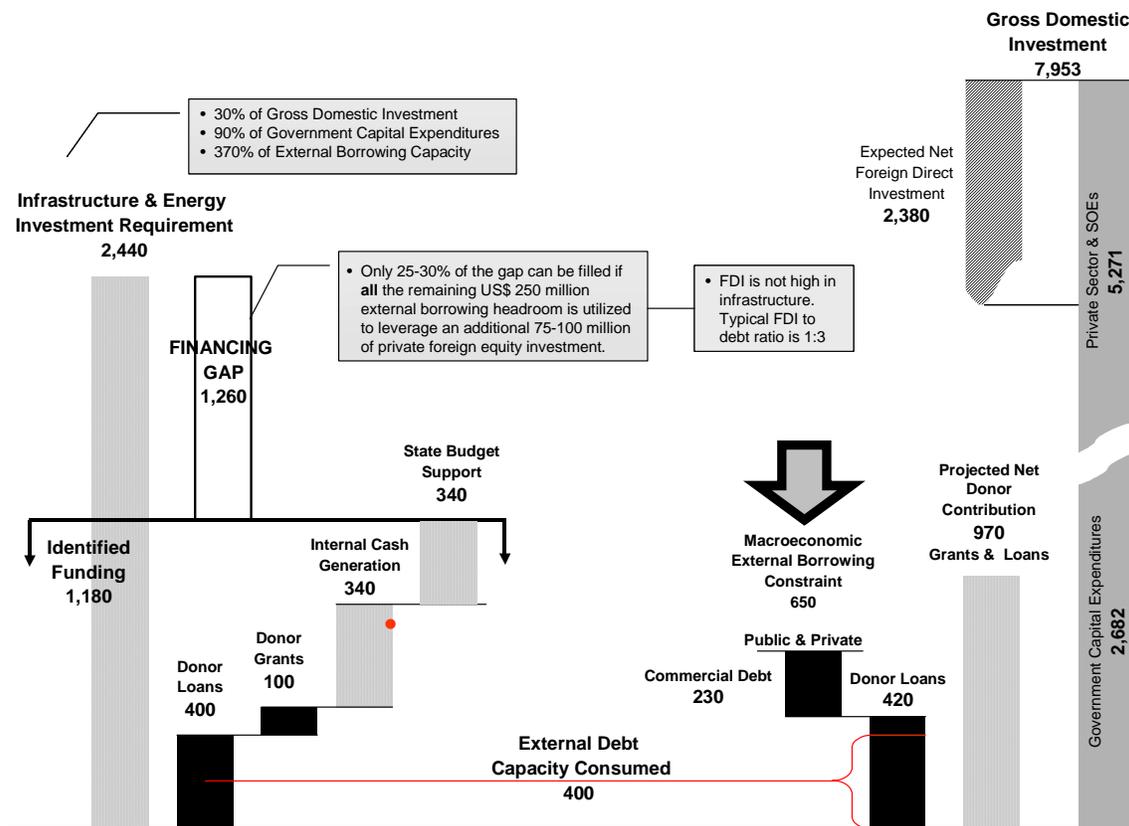
This debt ceiling of USD 650 million is extremely restrictive – both for the country and for the infrastructure and energy sectors. To put the ceiling in perspective:

¹¹ Projections obtained from the IMF Document on the Second and Third Reviews, June 3, 2003.

- The current expectation of around USD 400 million of donor loans for infrastructure and energy consumes a little over 60% of the debt headroom.
- Even if the remaining USD 250 million of debt headroom is utilized for infrastructure and energy – it could leverage about USD 75-100 million of private sector equity – totally meeting an additional 30% of the financing gap.

Government Guarantees Raising commercial debt for the infrastructure and energy sectors in the medium-term, is likely to require robust government guarantees. This would effectively create a direct or contingent obligation on the government. The government guarantees would be necessary given the existing country and sectoral risk in BiH. Additional or complementary political risk insurance from bilateral or multilateral agencies may also be necessary to raise this commercial debt. There is the potential for commercial debt with the possible backing of Export Credit Agencies (ECAs) for infrastructure sectors such as electricity and gas.

Figure 3.1: Schematic Representation of Investment Needs and Sources
From 2003 to 2007
 (all figures in USD million)



(b) **Foreign Private Investment** (defined as foreign equity investment) – Total foreign investment expected for the period 2003-2007 is about USD 2,380 million¹². In theory, the expected volume of foreign direct investment could be adequate to meet the financing gap – however, the actual inflow to the infrastructure and energy sectors for the same period is likely to be small to negligible for several reasons.

- ⌚ Country Risk: Bosnia has a high perceived country-risk owing to its recent history and political arrangements with three Governments (plus the OHR). Although investors may view shorter-term payback investments in manufacturing, commodities and other service sectors differently, the infrastructure and energy sectors, with their high capital intensity and longer-term payback are not attractive prospects for external (or even domestic) private investment. Apart from the political risk perceptions about BiH, there are also broader administrative and procedural constraints that adversely affect the business environment in BiH. These have been adequately covered in other recent reports¹³ and are not repeated here.

- ⌚ Medium-Term Prospects for Private Investments in emerging market infrastructure worldwide are not comforting. The individual sector circumstances are discussed in points i. to v. below. Apart from specific country-risk, the infrastructure and energy sectors are at an early stage of reform, making the regulatory and associated risks extremely high for an external investor.

- ⌚ Pure Equity is not a Big Component of Private Investment: Most private investments in infrastructure and energy worldwide are typically highly leveraged with equity-debt ratios being less than 1:3. Thus even if all the expected external commercial debt headroom is allocated to the infrastructure and energy sectors, there would be no more than about USD 75-100 million of foreign equity investment into infrastructure.
 - i. **Water Supply and Sanitation** – International investors in water have expressed a unanimous view that they are not willing to take on the risk of bringing in fresh capital into water sector concessions.¹⁴ They consider non-operational risks, in particular regulatory, currency, payment, sub-sovereign, and affordability risks to be excessive. While some firms remain interested in management contracts, these arrangements will not lead to new capital infusions. Water supply being within the purview of municipally-owned utilities, presents an additional and perhaps unacceptable level of sub-sovereign risk for private investors.

 - ii. **Solid Waste** – The solid waste sector in the BiH has already demonstrated the feasibility of obtaining private investment for public waste collection with a private-public joint-venture in the Zenica municipality. The investment volume has been small with about KM 0.6 million in equity and KM 1.5 million in debt since 1999. There is scope for similar ventures to be implemented based on the financial creditworthiness of municipalities. The solid waste sector also presents good opportunities for domestic private involvement for collection.

 - iii. **Power** – Only 2% of the international private power investors surveyed in early 2002 are interested in increasing their involvement in emerging markets in the medium-term (next 3-5 years).¹⁵ Capital market conditions for investors trying to raise capital

¹² Projections obtained from the IMF Document on the Second and Third Reviews, June 3, 2003.

¹³ Commercial Legal Framework & Administrative Barriers to Investment, Foreign Investment Advisory Service, March 2001.

¹⁴ Draft proceedings of the Vienna Conference on Private Sector Participation in Water in ECA, July 2-3, 2003.

¹⁵ What International Investors Look for When Investing in Developing Countries, Energy & Mining Sector Board Discussion Paper No. 6, May 2003.

have worsened significantly since early 2002 with the Enron crises, subsequent high profile debt downgrades (AES, Mirant now in Chapter 11, EdF), and decreased capital market enthusiasm for exposure to emerging market energy investments. Furthermore, there are less-risky opportunities for international power investors being offered in both developed and emerging markets that would compete perhaps more favorably than assets in Bosnia. Given the country risk and the non-existent regulatory track-record, it is unrealistic to expect private investors to enter BiH in the medium-term. On a more positive note, the BiH power companies, have in contrast to a number of emerging market power companies achieved a tariff regime that is able to cover operating costs and could provide an adequate debt service buffer. Consideration should be given to allowing these firms to access equipment purchase credits through Export Credit Agencies.

- iv. Gas – The gas sector is still at a very early stage of development and the market and regulatory risks remain high. The fragmentation of the main gas pipeline infrastructure is a serious obstacle to any potential foreign investor. Private investors in gas transmission or distribution are likely to insist on contracts that will require the government to guarantee a minimum revenue level – effectively standing as a contingent obligation on the government. The experience of getting private investment into “greenfield” gas concession development is extremely limited in the ECA region overall. Without fundamental reforms the potential for private sector investment would be limited in the gas sector. Some form of public guarantee may also be required till a credible track record of good regulation is observed.
- v. The coal, district heating and railways sectors present very little potential for private sector investment over the next five years. The coal and railway sectors require investments and restructuring to achieve a basic level of commercial viability. The district heating sector is presently both unviable without substantial investments in rehabilitation combined with tariff increases and better revenue collection discipline. As in the case of water-supply, district heating being a municipal responsibility also presents a sub-sovereign risk that foreign private investors are likely to be uncomfortable with under existing circumstances.

(c) **Reduced Donor Inflows:** Donors perceive their role to be much reduced as compared to their assistance during the emergency reconstruction phase (1995-2000) and the recent consolidation phase (2000-2002). Discussions in May 2003 among all the major donor agencies represented in Sarajevo revealed a surprising degree of similarity of approach to new assistance for BiH in the coming years. The vast majority of Donors signaled both a reduction in the volume of their assistance as well as its reorientation away from project lending (such as for infrastructure), to advisory services and technical assistance. The reduction in donor financial inflows is occurring for three reasons.

- ⌚ There is a sense of accomplishment among most donors that BiH has successfully moved beyond the most difficult post-conflict reconstruction phase.
- ⌚ Many bilateral donors have other priorities and demands on their aid resources particularly with the number of other countries entering a post-conflict phase (e.g. Afghanistan, East Timor, and West African states).
- ⌚ There is a sense of disillusionment amongst most donors with the slow pace of reforms and what is perceived to be a lack of commitment to fundamental institutional reforms and improving governance.

Table 3.1 presents a partial picture of donor thinking as regards future assistance to BiH. All donors were not consulted and the responses shown here are indicative, rather than formal commitments. Most donors work on shorter planning cycles than 5 years and are unable to

anticipate future assistance beyond 2004-5. Nevertheless, the table reveals worrisome signs of a major cutback, both in terms of overall volumes of assistance as well as that for investment projects. In the recent past, total donor financing for investment projects in BiH has amounted to KM 700-800 million (US\$ 400-460 mn) annually. If the same rate of donor inflows were to be maintained, the total of about US\$1000 million shown in the table below would represent about two years funding. Here it is to cover a five-year period. While this comparison may possibly overstate the shortfall, it seems likely that even after a more exhaustive consultation with donors has been completed, the increased availability of donor funds will still not bring the total up to recent levels.

Table 3.1 Indicative Donor Resources 2003-2007
(in millions of USD)

Donors	Total for all sectors	Tentative Contribution for Infrastructure Investment	Comment Regarding Infrastructure Involvement
CIDA		2	TA in energy
EBRD	220	150	All infrastructure – prefer shift to commercial projects with no Government Guarantee and sub-sovereign projects
EIB	220	150	All infrastructure
EU	50		For TA only – water and sanitation
Italy	110	50	Solid Waste, Railways
Japan	110	50	Railways, Roads
Norway	70	40	Water and Municipal services
Sida	20	10	Municipal services and TA
USAID	10-20	10	Municipal services and TA
World Bank – IDA	150	30	Water & urban services project ready for approval
World Bank – IBRD	(20-40)	(30)	Post 2006 For commercial/enclave projects
TOTAL	1000 approx	500 approx.	

Note: Conversion based Euro 1 = US\$1.10

Strategies to Bridge the Financing Gap

BiH has few options to bridge the financing gap. In most cases the most critical constraint would be the external borrowing constraint.

- (a) **Establishing an External Borrowing Strategy** – External borrowing by BiH is strictly controlled based on a periodic evaluation of its creditworthiness indicators. These indicators include Bosnia's existing stock of external debt and its ability to service foreign exchange obligations within the currency board limits. As noted the external debt limits provide for a notional USD 230 million of commercial debt (interpreted as that not requiring a Government guarantee) and about USD 420 million of official debt (from multilaterals/bilaterals). It is suggested that the external borrowing constraint be reviewed to see whether additional borrowing headroom can be prudently established.

Within the existing limitation, or a suitably revised limit, it would be appropriate to explore the following:

- ⌚ **Non-Concessional ODA Financing:** It may be feasible for revenue earning infrastructure and energy entities to borrow non-concessional ODA funds (such as IBRD) to partially meet their priority investment needs. Levels for this borrowing could be established in a manner that do not conflict with indicators of overall creditworthiness.
- ⌚ **Export Credit Financing:** Sectors such as electricity, gas, railways and to a lesser extent district heating have the potential to procure some of their capital equipment using suppliers' credits. The Government should review BiH's current status among export credit agencies (ECAs) and attempt to obtain improved coverage terms from them.

(b) **Increasing Internal Cash Generation** (or Self-Financing) – An across the board effort to step up the degree of internal cash generation is absolutely essential. Increases in user charges and tariffs will be necessary to boost levels of internal cash generation. But these will need to be accompanied by strengthening the social protection system in order to protect poor consumers. In most sectors the increased cash will in the first instance have to be utilized to meet routine maintenance needs to prevent further asset degradation. Apart from the financial resources that can be used for investments in the medium-term, increased self-financing would provide security to potential lenders and financiers by signaling the ability of the sector/enterprise to sustain and service higher levels of up-front borrowing to meet investment needs.

(c) **Selective Use of Government Guarantees for Priority Investments** The Government of BiH has to presume that government guarantees will indeed be required to raise external and domestic financing for much of their infrastructure investments over the next few years. The Government's "guarantee capacity" has its limits. The objective for the Government is to utilize this capacity judiciously. Some of the Government guarantees will represent direct financial liabilities on the Government budget, particularly if the beneficiary sectors or enterprises are unable to service the debt. In other instances, the liability will be more indirect, or contingent upon failure by the sectors/enterprises to service the debt. Both types of liabilities will be unavoidable – for example, concessional debt for the coal or railways sector may represent a direct financial obligation on the government, while debt for the electricity and gas sector would only be contingent on non-performance of the companies. To use this limited guarantee capacity to best effect, the Government should prioritize the investments that should be undertaken in BiH. Some investments may be worth postponing, such as, some water treatment plants, motorways and flue-gas desulfurization in coal-burning power plants.

3.2 Inefficiencies from Fragmentation and Decentralization

BiH pays a heavy economic price for the excessive fragmentation and decentralization of infrastructure and energy service delivery firms and government oversight responsibilities. There are three inter-linked dimensions to this.

- ⌚ **Network Infrastructure Divided Along Entity Lines** – Dividing essential *network* infrastructure across multiple companies creates large investment and operating inefficiencies that BiH can scarcely afford. The fundamental cost structure of network infrastructure enterprises increases as operations are fragmented into separate firms. Apart from negatively affecting financial viability, ultimately the consumer does not get the requisite level of service necessary to encourage rail travel. There is also confusing fragmentation of government oversight across several Entity-level ministries, as well as

Coordination Councils. New regulatory agencies are also in the process of being created along separate Entity lines.

- ⌚ Decentralization of certain public utility responsibilities to municipalities, while appropriate, is also associated with a tendency for Municipal Councils to take an exceedingly short-term view of service delivery and sustainability. Political considerations predominate in tariff setting, and a lax attitude towards enforcing revenue collection from users exists. Infrastructure degradation and the impact on future service needs is not a big factor in the decisions made by Municipal Councils. In some sectors, specifically water supply there is also a question of whether having 130-plus municipal water utilities and service providers is indeed efficient.
- ⌚ Insufficient Tax Sharing – The tax-sharing mechanism does not provide for adequate investment resources for fiscally-weaker (and poorer) municipalities, effectively institutionalizing poor service where the needs are the highest.

Fragmentation of Service Companies Table 3.2 indicates the level of responsibility for service provision for infrastructure and energy sectors across the BiH. Interestingly, and perhaps unsurprisingly, there is very little responsibility for service provision at the State level and an extremely high concentration of responsibility at the Entity level and also at the municipal level.

Table 3.2 Sectoral Coverage and Level of Service Responsibility

	State	Entity	Cantonal (Federation)	Municipal
Water & Sanitation			X	X
Solid Waste				X
Power	X (Emerging)	X		
Coal		X		
Gas		X		
District Heating			X	X
Roads		X	X	X
Railways		X		

The key issues with fragmentation and decentralization are discussed below:

- (a) **Investment and Operational Inefficiencies of Network Service Fragmentation:** Network infrastructure services, such as electricity, gas, and railways, typically benefit from:
- Integrating the network assets into a single entity and their operation by a single operator.
 - Unitary regulation of the network to ensure fair access to all users and the coordination of network investments.

Neither of the above conditions prevents having multiple owners of these combined assets through different joint-ownership arrangements – for example, through a joint-stock company structure such as agreed for electricity transmission (see item ii below). The sector specific problems of network infrastructure operations along Entity lines are discussed below.

- i. Gas: The operational responsibility for the main (high-pressure) gas pipeline infrastructure network in BiH is divided between three companies, BiH-Gas (within

the Federation), Gaspromet-Pale (Serbia-RS border to Zvornik), and SarajevoGas-Lukavica (Zvornik-Kladanj)¹⁶. The problem with this fragmented operational structure is that:

- there is no coordinated view of the development of the gas network that would lead to the lowest-cost investment program and service;
- it adds to overhead costs without any commensurate benefit to consumers; and
- it acts as a barrier to private sector entry into distribution system development as the complex pipeline operation arrangements pose high non-operational risks.

It is important that the current arrangements be reviewed and steps taken to form a single gas transmission entity with the responsibility for the ownership and operation of the main network. Separation of pipeline segments to separate concession/ownership arrangements should be undertaken only when a clear framework for the regulation of pipeline access is implemented.

- ii. Electricity: The electricity sector in BiH is owned and operated by three separate integrated companies¹⁷, each of whom dispatch their generation independently and plan investments independently. The operational and investment inefficiencies of this approach are likely to be substantial. However, a major step is currently being taken with the consolidation of the electricity network assets that are separately owned and operated by the three electricity companies into a single transmission network company that is organized as a joint-stock company owned by the two Entity Governments in proportion to the value of the assets contributed. The consolidation of the transmission infrastructure into a single company is a major achievement and would be an appropriate model to adopt both for the consolidation of the gas and railway sector infrastructure. The consolidation of network infrastructure and coordination dispatch, overseen by a single regulatory agency, would also serve to meet the conditions of the South East European Regional Energy Market (SEEREM).
- iii. Railways: The railways sector has the track and signaling infrastructure separated into two companies along Entity lines. To improve the coordination between the two Entity-specific railways corporations a joint public corporation called the BHRPC was created by the two Entities in 1998. BHRPC does not have any assets and is intended to be more like a joint supervisory and regulatory organization. The inefficiencies in the rail sector are high, which apart from separate track operation require trans-Entity trains to switch locomotives and crews at Entity-borders unnecessarily increasing the number of locomotives required in the country and wasting time. The BHRPC provides an existing State-level structure which could be reshaped to take on the responsibility for integrated track ownership and operation under the joint ownership of the two Entities.

To pursue the restructuring of the railways sector in BiH, it would seem appropriate to create a single holding corporation for the track and service segments of business across the two Entities. A single holding corporation will facilitate a comprehensive view of the services and rolling stock that should be retained to achieve a viable business model. As long as both the track infrastructure and rail services are accounted separately, the unbundling of the two can be postponed till overall financial viability of the railways as a whole is achieved.

¹⁶ In addition, a fourth company has been given a concession to build and operate a new high-pressure pipeline in the RS.

¹⁷ Elektroprivreda BiH (EPBiH) for the Bosnian region, Elektroprivreda Republika Srpska (EPRS) for the RS, and Elektroprivreda Hrvatske Zajednice Herceg-Bosne (EPHZHB) for the Croatian community.

- (b) **Weak Incentives for Municipalities to Take Longer-Term View of Efficient Delivery of Municipal Services:** A number of infrastructure and energy services fall within the purview of municipalities – specifically: water and sanitation; solid waste collection and disposal; district heating; and local roads. Typically, the service responsibility is with municipal “companies” (separated administratively and financially from the municipal government). These companies are generally considered autonomous and operate off-budget. Unfortunately most of the municipal companies face serious financial problems because the municipal Councils typically do not approve adequate tariff increases, nor enforce the collections of dues for the services provided. Although the ultimate responsibility to ensure service quality and delivery lies with the municipal councils, the political incentives are clearly short-term to keep tariffs low for constituents.

Affordability is often mentioned as reason for municipalities to maintain low tariffs. However, the analysis of spending on various municipal services indicates that the municipal services typically account for less than 2-3% of total consumption by households in the lowest income quintiles. In addition, most water experts in BIH confirm that pensioners and other households with financial constraints tend to be prompt payers of their bills and the worst defaulters are the other arms of the municipality or other government funded bodies. Typically, the largest arrears to municipal utilities are from municipal enterprises, army establishments and hospitals.

Ensuring effective financing and development of municipal service infrastructure will require an improved regulatory framework that creates incentives for municipal governments to set tariffs at a level that the full operating costs of these services can be covered and adequate provision is made for depreciation.

- ⌚ Water and Sanitation: Uniform, national-level tariff setting rules (such as would be set by a regulator) are needed to guide municipal water utilities. It will remain the responsibility of the municipal council to approve (or reject) tariffs that are determined using the national methodology. However, rejection of the tariffs without appropriate municipal budget allocations/subsidies to cover the revenue shortfall should lead to disallowance of the municipality from access to government debt/grants.
 - ⌚ Solid Waste: Introduce State-level regulation for waste collection and disposal and an enforcement mechanism to supervise municipal application of universal collection and sanitary disposal. The enforcement mechanism has to incorporate incentives for municipalities to join the multi-municipality regional waste disposal facilities – perhaps by subsidizing the establishment of these facilities from central government grants. Regional landfills would typically represent infrastructure that has a positive environmental externality and may therefore justify initial capital subsidies.
 - ⌚ District Heating: A State-level regulator is needed to assess appropriate levels of charges and act as a disincentive to municipalities to under-price services. However, as noted a separate regulator is not appropriate and a single energy regulator should be responsible for DH pricing issues.
- (c) **Inadequate Framework for Revenue-Sharing Across Municipalities –** There is a disconnect in the revenue raising capacity of municipalities and their investment needs for basic infrastructure. The problem stems from the broader issue of horizontal fiscal imbalances (i.e. between local governments). The

horizontal fiscal imbalances are particularly serious owing to the discrepancy between tax capacity and expenditure needs of the municipality. As the current system of tax assignment is based solely on the revenue derivation principle, the poorest and stagnating municipalities tend to suffer. Essentially, those with the weakest tax base often have the highest infrastructure needs per capita, but have inadequate resources to finance them. There is a need for some form of equalization mechanism to address this shortcoming. It has been suggested that some form of compensatory grant system be implemented that would allow each municipality to provide similar standards of public services.¹⁸

The manifestation of this problem of inadequate revenue sharing particularly affects water supply and road maintenance. Local road maintenance seems to be severely under-funded owing to the lack of municipal own resources, inadequate tax-sharing, as well as the shortfalls in allocation from the fuel taxes and vehicle registration fees.

Solutions to the broader horizontal fiscal imbalance issue will need to be defined as part of the fiscal decentralization reforms underway. From the perspective of infrastructure and energy sectors it would be useful to:

- ⌚ Ensure that Road Fund revenues are disbursed fully and on time to local governments.
- ⌚ Implement investment support schemes that address the needs of weaker municipalities. Schemes that depend on lending by intermediary Banks or that focus on large municipalities, by design gravitate to the better-off municipalities.

¹⁸ Creating an Efficient Decentralized Fiscal System, World Bank, (draft of June 2003)

Chapter 4.

Managing the Institutional Transition

The required institutional and managerial reforms in the infrastructure and energy sectors are the inevitable consequence of Bosnia's transition from an integral part of the socialist Yugoslav economic system, to an emerging market economy on the periphery of the EU. Adopting improved commercial and financial practices, better corporate governance arrangements, and a rules-based regulatory framework are essential to improve the performance of these sectors – and ultimately obtain private sector investment. Although the private sector role in providing incremental investment in the infrastructure and energy sectors is likely to be limited in the next five years, BiH needs to prepare the foundation for private sector financing. Private sector financing will be crucial over the longer-term to achieve fiscally stable and sustainable growth.

This chapter outlines specific institutional development steps and reforms that are needed in each sector in the next few years. While, the institutional transition is likely to require another 5-10 years to be fully completed due to the complexity and difficulty of achieving profound structural change in BiH's economic system, Bosnia cannot afford to delay these reforms. The institutional reforms outlined here would need to be accompanied by changes in other policy areas, especially improvements in the social protection system, if they are to be effective and not have a negative impact on the poor.

The list below is not exhaustive, but nevertheless contains the main priorities for action that should precede or accompany the physical investments listed in Annex I to this report. It should also be kept in mind that the success of these reforms may also depend upon the availability of finance for investments necessary to carry them out. Some of these institutional development activities would require specialized external assistance and are suitable for donor financing, while others can be undertaken by the BiH authorities themselves or by local consultants. The noted activities build upon the substantial donor funded technical assistance and institutional development support that have been undertaken in recent years – a partial list is provided in Annex II.

Sector	Institutional Development Steps	Time frame
1. National Infrastructure Issues	1.1 Developing a national infrastructure finance strategy that considers external borrowing and government liability constraints and establishes clear guidelines on how the limited capacity can be used to address key infrastructure needs.	2004
	1.2 Review of utility regulatory strategy for BiH. Proliferation of multiple sectoral and entity level agencies is inefficient and highly unlikely to be effective. A review of these arrangements should be undertaken with a view to consider utility regulatory agencies which may be more appropriate for small countries like BiH.	2005
2. Water Supply & Sanitation	2.1 Design UFW reduction programs for the largest water supply utilities, including improved billing systems, meter installation and regularization of illegal connections. Extend program to smaller	2004-2005

Sector	Institutional Development Steps	Time frame
	water utilities – or undertake this work in parallel. Comprehensive benchmarking studies should be undertaken to develop indicators on a country-wide basis through the Vodovod Association.	
	2.2 Implementing UFW reduction programs, possibly with TA/twinning arrangements with well-run international water supply companies. Establish national level training and capacity building programs.	2005-07
	2.3 Continue and expand training utility technical and financial staff in commercial and financial management (repeat and extend the successful USAID program)	2004-06
	2.4 Quantify extent of cross-debts among state-owned enterprises. Study options for direct payment arrangements for budget-funded bodies to reduce build-up of payment arrears for water and electricity. Define solution to be agreed and implemented by Government.	2004-05
	2.5 Carry out tariff studies to devise rules-based methodology for Municipal Councils to fix water and sewerage utility revenue requirements and tariff levels/structures.	2004-05
	2.6 Preparation and promulgation of requisite legislation and supporting regulations for tariffs setting methodology and guidelines.	2005
	2.7 Review and develop national program for consolidating smaller municipal utilities in large utility management companies to achieve scale and management efficiencies. (There are over 130 municipal water utilities in BiH. About 30% of these serve municipalities with a population of less than 10,000).	
	2.9 Establish priorities for waste-water treatment focusing on the larger urban settlements that are not treating waste water. Develop investment and operating schemes to ensure financial sustainability. Evaluate the economics and feasibility of phased waste-water schemes based on affordability.	2005-2007
3. Solid Waste	3.1 Expand management and technical training to increase administrative and financial capabilities at the local level to improve the cost recovery mechanism of the sector (extend ongoing WB/USAID program). Training in landfill operations to be expanded with twinning programs if appropriate.	2004-07
	3.2 Evaluation and identification of regional landfill sites for entire country. [at about a dozen locations]	2004
	3.3 Expand public communication programs on waste disposal issues to build support for legislation that will ban illegal dumping and closure of all open/wild dump sites.	2004-2005
	3.4 Review and revise Water Management Law to legislate enforcement measures and penalties to effectively monitor and close down wild dump sites.	2005
4. Electricity	4.1 Continue assistance to strengthen financial, accounting and management information systems in all 3 EPs to achieve unqualified audit reports. Support should also assist in achieving clear accounting separation of functions in line with EU guidelines.	2004-2006
	4.2 Design and implementation of programs to cut commercial losses in EPRS and EPHZHB. Improving customer management systems in all three EPs.	2004-05
	4.3 Preparation of a long-term power system expansion plan including the regional supply/demand balance and primary fuel choices;	2004
	4.4 Consultations and review of options to consolidate National	2004/5

Sector	Institutional Development Steps	Time frame
	regulation of power sector into single agency. Government to make a decision on preferred option by end-2004 (early 2005)	
	4.5 Training and building capacity of regulatory agencies – to consolidate the agencies into single National level agency in 2005	2004/5
	4.6 Technical support and training for the staff of the national transmission company and ISO.	2004-2006
5. Coal	5.1 Preparation of a coal sector restructuring and modernization program – focusing both on the technical investment needs and the social cost of the transition. Detailed strategy and cost estimate to deal with the social costs of the transition necessary – early retirement, coverage of future pension liabilities.	2004-2005
	5.2 Design and implementation of social impact mitigation programs – worker retraining; assistance for small business start-ups; etc.	2005-2006
6. Gas	6.1 Develop a gas sector development policy at the state level. Work should include: (a) evaluating the sector investment program at a national level to determine the least-cost solution for extending the transmission network to unserved cities in BiH (update Ramboll study); (b) a gas tariff study to eliminate price distortions and make gas a competitive fuel for industries and other consumers to spur gas market growth; (c) develop a transition plan to consolidate the sector across Prepare and pass State level legislation.	2004-2005
	6.2 Consolidate gas transmission network infrastructure and all existing gas import responsibilities within a single State company that is jointly owned by the entities.	2005-2006
	6.3 Develop and consolidate gas sector regulatory function within National energy regulatory agency (point 4.5)	2006-2007
7. District Heating	7.1 Comprehensive sector study/review and strategy. Improve knowledge base and understanding of issues and problems in the DH sector.	2004-2005
	7.2 Assistance to each district heating utility (excl. Sarajevo and Banja Luka) to prepare a detailed technical and economic evaluation of rehabilitation needs and loss reduction plans.	2004-2005
	7.3 Training and capacity building to improve commercial operations and management systems and for the preparation of financial recovery plans to accompany new investments.	2005-2007
8. Roads	8.1 Establish an integrated roads database and management systems for maintenance and monitoring.	2004-2006
	8.2 Capacity building (TA & training) at the level of the State Ministry of Transport and Entity Roads Directorates/Companies on investment planning and prioritization.	2004-onwards
	8.3 Evaluation and decision on rationalizing the multiple road agencies, including the consolidation of Cantonal road responsibilities into the Federation Roads Directorate.	2004-05
	8.4 Assess the public/private financing options for motorway construction to determine the least risky choice for BiH	2004-2005
	8.5 Undertake environmental impact assessments of motorway projects	As needed
9. Railways	9.1 Study to develop a State-level railway policy and railways restructuring program to establish the most efficient option for reviving rail use in BiH and lay the basis for its long-term viability. The formation of a single holding company across the two entities	2004-2005

Sector	Institutional Development Steps	Time frame
	to integrate track infrastructure and rationalize passenger and freight services may be an appropriate option to achieve comprehensive financial and operational restructuring. Study 2004 – Government decision 2005 – implementation 2005 onwards	
	9.2 Assess the need for preserving BHRPC and the case transferring its responsibilities to the State Ministry of Transport.	2004
	9.3 Assistance in implementation of the agreed model for rail industry restructuring, including mitigation of the social costs of staff reductions	2005 onwards
	9.4 Assistance to the rail companies in complying with EU directives on an accounting separation of infrastructure from operations and freight from passenger activities;	

Chapter 5.

Prospective World Bank Group Program

The World Bank in partnership with other members of the international donor community played a significant role in the infrastructure and energy sectors since the first post-conflict engagement in BiH in 1996. The World Bank has provided about USD 289 million for projects estimated to cost a total of USD 1,133 million (see table 5.1). Most of the difference between the World Bank financing and total project cost has been provided by other members of the international community.

The World Bank's total future support to Bosnia for investment, institutional development and economic adjustment is currently expected to be in the order of USD 30–35 million per year of IDA concessional lending, and subject to credit-worthiness and World Bank exposure limitations, perhaps about USD 30 million of IBRD lending from 2007 onwards. For infrastructure and energy this may represent about USD 30 to 80 million of new investment lending – the upper limit in the range being subject to institutional reforms and upgrading of BiH's creditworthiness. Additional World Bank support to the infrastructure and energy sectors may be feasible through sector adjustment lending (also called SECALs). Regional Adaptable Program Loans (also called Horizontal-APLs) may be an option for some infrastructure sectors where there are regional synergies and benefits, such as in electricity.

A condition precedent for expanding World Bank Group support for the infrastructure and energy sectors would be credible commitment and implementation performance on the institutional development step outlined in chapter 4.

Given the limited World Bank Group funding envelope for investment and adjustment support in Bosnia, engagement in the infrastructure and energy sectors will have to be selective. The basic criteria to evaluate the need and rationale for World Bank involvement would include:

- ⌚ **A clear comparative advantage for the World Bank Group in terms of program design and sectoral competencies.** For example in sectors where:
 - There are complex intra-governmental coordination issues which the WBG could address through its program/project design capabilities. These could be engagements with local governments in sectors such as water supply, solid waste, district heating and roads.
 - The World Bank has a unique and successful record of designing and implementing major sector rationalization programs in transition economies. The World Bank has considerable expertise in the rehabilitation and/or closure of uneconomical coal mines in Poland, Russia and Ukraine – which have several parallels with the issues in BiH.

- ⌚ **Additionality in terms of achieving fundamental institutional transformation where regional integration issues are important.** For example in addressing the institutional and investment needs in the development of regional markets in energy, as well as the implementation of the Barcelona Convention to improve infrastructure services along the Adriatic Coast. BiH is a signatory to the Athens

Memorandum 2002, where the countries of South East Europe¹⁹ and Turkey formally recognized the significant economic benefits from increasing power trade in the region, and agreed to develop a South East Europe Regional Energy Market (SEEREM). Each country to take specific restructuring and reform steps related to tariffs, regulatory bodies, transmission system operators and distribution system operators, and technically upgrade their systems to support commercial trade in power. The objective is to open the regional electricity market by 2007 and eventually integrate SEEREM within the EU's Internal Electricity Market.

- ⌚ **Achieving a high degree of financial leverage** – i.e. the amount of complementary co-financing from internal and external sources for every World Bank dollar. The World Bank Group's capacity in project design and implementation has often been a key factor in leveraging large amounts resources from other international partners. This has typically been the case in sectors like electricity, district heating and roads. In electricity and roads the leverage ratio in Bosnia has been in the range of 4 to 6. In addition, there are other grant resources such as from GEF, which the World Bank can leverage for projects with regional economic benefits.

Table 5.1 World Bank Assistance in Infrastructure and Energy (1996-2002)

	WB Lending	Total Project Cost	WB Leverage Ratio
Water Supply, Sanitation, and Solid Waste (WSSS)			
Water, Sanitation and Solid Waste Urgent Works Project ^S	20	75	3.8
Mostar Water Supply and Sanitation Project	12	14	1.1
Solid Waste Management Project	18	21	1.1
Sub-Total WSSS	50	110	2.2
Energy (Electricity, Gas, District Heating)			
Emergency District Heating Rehabilitation Project ^S	20	41	2.0
Emergency Electric Power Reconstruction Project	35	165	4.7
Emergency Natural Gas System Reconstruction Project	10	40	4.0
Electric Power Reconstruction Project – II	24	160	6.6
Electric Power Reconstruction Project – III	35	231	6.6
Sub-Total Energy	124	637	5.1
Roads and Transport			
Emergency Transport Reconstruction Project ^S	35	161	4.6
Emergency Transport Reconstruction Project	39	168	4.3
Trade and Transport Facilitation in Southeast Europe	11	15	1.4
Road Management & Safety Project	30	42	1.4
Sub-Total Roads & Transport	115	386	3.3
Total Bank Infrastructure and Energy Project in BiH	289	1,133	3.9
Total Bank Lending (inc. Infrastructure and Energy)	965	2,502	2.6

^S Special Financing Projects – the rest are all IDA projects.

¹⁹ Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Greece, Kosovo, Macedonia, Romania, Serbia and Montenegro

Prospective World Bank Group Engagement in Infrastructure and Energy

Based on the above evaluation criteria, the following areas for World Bank support would be worth detailed consideration:

(a) Municipal water supply and urban infrastructure <i>(project implementation about to commence)</i>	- Upgrading water supply and sanitation, improving municipal service delivery in line with urban management development plans.
(b) Local Roads	- Rehabilitation and upgrading of local (regional and municipal) roads where the needs are the greatest. - Supporting the implementation of a comprehensive maintenance monitoring database. Rationalization of Cantonal responsibilities and the role of BRIC.
(c) Energy Market Integration – Electricity	- Strengthening dispatch, communication and transmission networks for integration to the South East Europe Regional Energy Market. - Supporting the consolidation of transmission responsibilities and creation of unified regulatory agency. (Could be to developed as an IBRD project given creditworthiness of power sector. Project components could also be part of a Regional APL)
(d) Regional Water Quality Improvement	- Environmental improvement of Trans-Boundary rivers and systematic monitoring for water quality improvement - Support coordination between numerous agencies and collaboration with neighboring countries to reduce water pollution . Fund waste-water treatment facilities in line with needs and affordability.
(e) Coal Sector Modernization and Rationalization (SECAL)	- Support the Government to rationalize the coal sector to achieve fiscal sustainability. - Institutional support in design of mine closure programs and the associated programs to mitigate social impacts.
(f) Railways Reform and Restructuring	- Implementation of railway restructuring and rationalization with focus on achieving economic scale of operations.

The first two areas (water supply and roads) are likely to be stand-alone investment operations, while electricity could be developed as part of a regional lending operation; the last two are more suitably addressed under sectoral adjustment operations.

ANNEX I

Priority Infrastructure and Energy Investment Needs

2003-2007

**Table A.1 Water Supply and Sanitation Sector
Investment Needs and Financing Sources (2003—2007)**
(all numbers in USD million)

	Total Requirement	Municipal Self-Financing	State/Entity Budget Contribution	Gap
Water				
Increased access (250k h/holds) @\$ 200 per connection	50	15	10	25
Rehabilitation to reduce UFW by 10%	35	5	5	25
Improved metering & billing programs	15	5	5	5
Sub-Total Water Supply	100	25	20	55
Sanitation				
Sarajevo WWTP rehabilitation	25	5		20
Increased access (250k new connections) @\$200 per connection	50	10	5	35
Sewage network rehabilitation	15	5	5	5
Sub-Total Sanitation	90	20	10	60
Lower Priority Memo Items				
Sewage Collection and WWTP B.Luka, Mostar, Tuzla & Zenica	100			
Sewage collection and construction of new WWTP for 8 towns of 70-100,000 population	70			

**Table A.2 Solid Waste Sector
Investment Needs and Financing Sources (2003—2007)**
(all numbers in USD million)

	Total Requirement	Municipal Self-Financing	State/Entity Budget Contribution	Gap
Water				
Sanitary landfills (@\$50 per capita) and cleanup of dumps	50	10	10	30
Collection and Transport equipment	10			10
Sub-Total Solid Waste	60	10	10	30

Table A.3 Electricity Sector – Investment Projects²⁰ (2003—2007)

	(KM million)	(USD million)
EPBiH		
Generation Rehabilitation	234	138
Jablanica Hydro plant	25	
Thermal plants		
Tuzla Unit 5 life extn.	66	
Tuzla Unit 6 life extn.	44	
Other Tuzla TPP rehabn works	42	
Kakanj Unit 6	47	
Other Kakanj works	10	
Transmission projects	49	27
Distribution Projects	130	75
SUB-TOTAL EPBiH	413	240
Lower Priority EPBiH		
Kakanj new 100 MW gas-fired plant	(80)	
Tuzla and Kakanj desulfurization	(135)	
EPRS		
Generation Rehabilitation	209	122
Hydro plants	121	
Gacko TPP	43	
Uglevik TPP	45	
Transmission projects	229	132
Distribution Projects	151	88
SUB-TOTAL EPRS (excl. memo items)	589	342
Lower Priority EPRS		
New Banja Luka CHP		
Buk Bijela HPP		
Uglevik desulfurization	(74)	
EPHZHB		
Generation Rehabilitation	83	48
Rama	19	
Mostar	7	
Jajce I	6	
Jajce II	9	
Capljinja	6	
Pec Mlini hydro (under construction)	38	
Transmission projects	68	40
Distribution Projects	120	70
SUBTOTAL EPHZHB	273	158
Lower Priority EPHZB		
Mostarsko Blato Hydro	134	
Wind generators	12	

²⁰ Excluding ongoing or committed investments under Power III

**Table A.4 Electricity Sector
Investment Needs and Financing Sources (2003—2007)**
(all numbers in USD million)

	Total Requirement	Self-Financing 30%	State/Entity Budget Contribution	Gap
EPBiH	240	72		168
EPRS	342	103		239
EPHZHB	158	47		111
Sub-Total Electricity	740	222		518

Table A.5 Gas Sector – Priority Investment Projects (2003—2007)

	(KM million)	(USD million)
Federation		
Sarajevogas	15	9
BH-Gas	112	65
Other (peak shaving)	36	
Kladanj-Tuzla pipeline	42	
Tuzla distribution	27	
SUB-TOTAL Federation	232	135
Republika Srpska		
Banja Luka pipeline	200	
Bijeljna gas distribution	34	
Brcko distribution	10	
Banja Luka distribution	30	
Other towns distribution	50	
SUB-TOTAL Republika Srpska	324	188
TOTAL	556	323

**Table A.6 Gas Sector
Investment Needs and Financing Sources (2003—2007)**
(all numbers in USD million)

	Total Requirement	Self-Financing	State/Entity Budget Contribution	Gap
Sarajevogas	9			9
BH Gas	65	65		-
New Transmission	161			161
New Distribution	88			88
Sub-Total Gas	323	65		258

**Table A.7 Coal Sector
Investment Needs and Financing Sources (2003—2007)**
(all numbers in USD million)

	Total Requirement	Self-Financing	State/Entity Budget Contribution	Gap
Federation				
Mine Modernization	205	5	52	148
Environmental Restoration	-	-	-	-
Early Retirement & Layoffs	55	-	-	55
Sub-Total Federation	260		52	203
Republika Srpska				
Gacko Modernization	52	35	-	17
Uglevik	25	-	16	9
Sub-Total Republika Srpska	77	35	16	26
TOTAL	337	40	68	229
Lower Priority Memo Items				
Stanari	70			

**Table A.8 District Heating Sector
Investment Needs and Financing Sources (2003—2007)**
(all numbers in USD million)

	Total Requirement	Self-Financing	State/Entity Budget Contribution	Gap
Sarajevo	26	-	-	-
Banja Luka	29	-	-	-
Tuzla	15	-	-	-
Other Cities	50	-	-	-
Sub-Total District Heating	120	15	15	90

Table A.9 Roads Sector – Priority Investments (2003—2007)

	(KM million)	(USD million)
MAIN ROADS (Rehabilitation/Reconstruction)		
Total Federation	115	70
Sarajevo-Tuzla (55km) M18	50	
Bihac-Novigrad (51km) M14	35	
Stolac-Neum (51km) M17.3	20	
Sanski Most-Ključ (32km) M15	10	
Total RS	65	40
Šamac-Šešljije (47km) M17	25	
Brod-Derventa (25km) M14.1	25	
Derventa-Šešljije (21km) M17.2	10	
Novi Grad-Prijedor (31km) M4	5	
SUB-TOTAL: Main Roads	180	110
REGIONAL ROADS - FEDERATION		
Blažuj-Kaonik Road (50km) R442	4	
Gradačac-Ormanica Road (14km) R462	2	
Gracanica-Srnice Road (24km) R455a	2	
Čepče-Čivinice Road (70km) R465/467/469	5	
Domaljevac-Bazik (32km) R464	5	
Goražde-Hrenovica (20km) R448	8	
Mokronoge-Ravno (20km) R418	8	
Simin Han-Površnica R458	2	
Vitovlje-Ovnak (5km) R413a	2	
Gostilj-Jajce (21km) R413b	5	
Rastovci-Gornji Vakuf (16km) R439	5	
Bila-Bukovica (11km) R440	5	
Visoko-Tarčin (8km) R443	4	
Donji Vakuf-Bugojno (4km) R481	2	
SUB-TOTAL REGIONAL ROADS - FEDERATION	60	35
REGIONAL ROADS – RS		
Trebinje-Grab (15km) R429	5	
Berkovići-Nevesinje (30km) R435	5	
Konjevic polje-Srebrenica (31km) (R453, R454a)	3	
Priboj-Lopare (9km) R456	2	
Mrakovica-Kozarac (12km) R 477	3	
Caparde-Tišća (31km) R455	3	
Jezero-Kupres (41km) R415	8	
Karanovac-Kneževo (35km) R414	6	
Šipovo-Barač (15km) R 415 ^a	5	
SUB-TOTAL REGIONAL ROADS - RS	40	25
MOTORWAYS		
Jošanica-Blažuj (Sarajevo Bypass 15km)	160	
Klašnice-Gradiška (39km)	220	
SUB-TOTAL Motorways	380	220

**Table A.10 Roads Sector
Investment Needs and Financing Sources (2003—2007)**
(all numbers in USD million)

	Total Requirement	Self-Financing	State/Entity Budget Contribution */	Gap
Federation				
Main Roads	70	-	-	-
Regional Roads	35	-	-	-
Sub-Total Federation	105		25	80
Republika Srpska				
Main Roads	40	-	-	-
Regional Roads	25	-	-	-
Sub-Total Republika Srpska	65	-	25	40
Motorways	220		40	180
TOTAL	390	-	90	300

*/ Assumed to contribute 25% of required funds in total.

Table A.11 Railway Sector – Priority Investments (2003—2007)
(in millions of KM unless otherwise indicated)

Project	□FBiH	□RS	TOTAL
Track Overhaul of Konjic-Mostar Section (Corridor Vc)	65	0	65
Track Overhaul of B. Šamac-Doboj Section (Corridor Vc)	0	65	65
Signalling systems along Corridor Vc and West-East Line	125	110	235
Telecommunication systems along Corridor Vc and West-East Line	30	25	55
Freight wagons	15	13	
Passenger coaches	2	3	
Diesel locomotives	12	4	
Workshop equipment	5		
TOTAL (million KM)	254	220	474
TOTAL (million USD)	147	128	275

ANNEX II

Recent Donor-funded Technical Assistance and Institutional Development Activities

Recent Donor-funded Technical Assistance and Institutional Development Activities

Activity	Status	Donors
WATER/SANITATION:		
Water supply, solid waste flood control and sanitation projects, technical assistance program nationwide to train utility technical and financial managers in the latest commercial and financial practices, Cost Recovery Planning Training	Completed	USAID
Improve utility management and operations through participation in international seminars, conferences and tours	Ongoing	WB Mostar Water Supply and Sanitation project
Training programs to include modern sector management methods and practices	Ongoing	WB Mostar Water Supply and Sanitation project
Institutional Strengthening of the water sector, which include the following aspects: <ul style="list-style-type: none"> ☐ reform management structure – introducing concepts of river basin management; ☐ review water facility laws, to secure that water utilities have a new framework to develop and allow for private capital investment; ☐ provide training and capacity building; ☐ Human resources project aspects (national) 	Partly completed/Ongoing	EC Phare/CARDS Program
Water quality study	Completed	EPTISA/Spain Italy
Technical Assistance/Institutional strengthening of water utilities in the 6 municipalities	Completed	Austria/GWCC
Technical assistance to strengthen the monitoring system of Sava river JICA	Ongoing	Japan/ JICA
Training in Engineering on water supply systems	Planned	Japan/ JICA
Technical assistance – support to establish ecosystem in the Neretva river – first phase	Planned	Spain
Technical assistance – support to establish ecosystem in the Neretva river – second phase	Completed	Spain
SOLID WASTE:		
Increase administrative and technical capacity for solid waste management at the local and Entity level and improve the cost recovery mechanism of the sector	Ongoing	WB Solid Waste Management Project
Public communication program and environmental monitoring to include capacity building, public awareness activities, media campaigns, and introduction of environmental subjects in education programs	Ongoing	WB Solid Waste Management Project

Activity	Status	Donors
Develop Medium-term business plan for the future development of the SWM system	Planned	WB Solid Waste Management Project
Training in disposal, landfill operations and closure and design of future landfills to develop financial management capacity	Ongoing	WB Solid Waste Management Project
Nationwide Solid waste management strategy	Completed	EU
Feasibility study for possible waste dump site locations – EC	Completed	EU
Pilot project on waste recycling	Planned	EU
Institutional building – drafting and implementing environmental framework legislation/ 5 laws	Ongoing	UE
Public relations campaign on protection of environment in 6 BH municipalities	Ongoing	Austria/GWCC
Technical assistance to preserve the environment and to prevent pollution	Planned	JICA
Training in Waste disposal infrastructure and its operation	Planned	JICA
ELECTRICITY		
Assistance In Establishing a Department of Energy Within the State Ministry of Foreign Trade & Economic Relations.	Completed	CIDA/SEETEC
Assistance to Local Experts in Preparing for Restructuring and Privatization	Completed	CIDA/SEETEC
Assistance in the Establishment of a Single Transmission Company - Phase II	Ongoing	CIDA/SEETEC
Development of Market Rules and Market Design , Phase I	Ongoing	CIDA/SEETEC
Assistance in the Establishment of a Single Transmission Company - Phase III	Planned	CIDA/SEETEC
Assistance to ZEKC to become the Independent System operator.	Phase I completed, Phase II on hold.	DfID
Strengthening accounting practices in the 3 EPs to bring them into line with GAAP.	Completed	EBRD
Financial management assistance to the 3 EPs.	Phase I just completed	EU (Phase II to be funded by IDA)
SCADA Systems Feasibility Study (Supervisory Control and Data Acquisition) system for ZEKC	Completed	USTDA
Konjic Hydroelectric Power Plant Feasibility Study (EPBiH)	Completed	USTDA
Tuzla and Kakanj Power Plant Rehabilitation Study and Financing Plan (EPBiH)	Completed	USTDA
EPBiH Telecommunications Feasibility Study and Pilot Project	Study completed, pilot project about to start.	USTDA
Legal assistance for the creation of the STC and ISO	Ongoing?	USTDA
Study of power sector institutional restructuring	Completed	USTDA
COAL:		

Activity	Status	Donors
Coal Mines Rehabilitation Feasibility Study for the Middle Bosnia and Tuzla coal mines.	Completed	USDTDA (Marston & Marston)
GAS:		
Long-term gas sector development plan	Completed	World Bank (Ramboll)
Natural gas sector restructuring study	Completed	World Bank (NERA)
DISTRICT HEATING:		
Banja Luka District Heating Rehabilitation- technical and financial feasibility study	Completed	USTDA
TRANSPORT		
Regional Balkans Infrastructure Study - Transport (REBIS Study)	Completed	EU
Transport Infrastructure Balkans regional study (TIRS)	Completed	France
Bosnia and Herzegovina transport master plan	Completed	JICA (PCI)
Roads and Railway sector investment needs and institutional assessment	Completed	World Bank (IPSA Institute)
ROADS:		
Feasibility and environment impact assessment study for Sarajevo bypass road.	Ongoing	EIB
TA for road, bridges and tunnels data bank	Ongoing	World Bank Road Maintenance and Safety project
TA for establishment of environmental units within Road directorates	Ongoing	World Bank Road Maintenance and Safety project
TA for Traffic safety component of RMSP	Ongoing	World Bank Road Maintenance and Safety project
Training in HDM-4	Ongoing	World Bank Road Maintenance and Safety project
RAILWAYS:		
Diagnostic study and assistance with project definition and preparation	Completed	EBRD
TA for international procurement and project implementation	Ongoing	EBRD
TA for accounting, business planning, commercialization, MIS	Ongoing	EBRD



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