

**Emerging Investment
Opportunities
in
Major Power Desalination
Projects
in
Saudi Arabia
October, 2004
Chamber of Commerce
Riyadh / Jeddah**

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FICHTNER



CONSULTING & IT



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WASSER & INFRASTRUKTUR

Content

- Energy/ Water Demand and Supply Development
- Investment Needs / Requirements
- Regulatory Framework
- Market Structure, Key Players, IWPP Regime
- Key Challenges
- Conclusions

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The Saudi Electricity Market and IWPP opportunities

Energy/ Water Demand and Supply Development

The Saudi Economy experiences a tremendous structural change and is driven by the following main aspects:

- Growing population from 24 Mio. as per today to 39 Mio. as per forecast applicable for 2020
- Tie in of Saudi Industries into international “Downstream- Production” competition, different from Basic Industry activities as experienced in the past
- Facing the challenge to adopt international standards as applicable for non-discriminatory, transparent competition as a precondition for accession to WTO as (originally) scheduled in 2005
- Growing industry / production capacities, resulting to reinforcement and extension of the domestic infrastructure in general
- Thus, KSA already launched substantial programs to overwhelm existing barriers in the past and to reinforce international competition and sustainable develop domestic welfare
- There is an urgent need to promote substantial investment in both in energy and water projects encouraging private investors to join

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The Saudi Electricity Market and IWPP opportunities

Investment Needs and Requirements / 1 /

- In order to accommodate future challenges the following major initiatives were launched:
 - Privatization of state owned infrastructure - in particular:
 - Liberalization of the energy sector promoting private capital participation in power and water business to tackle financing challenges arising from an average growth of energy demand as predicted to be around 5 % per year
 - Implementation of new energy strategies that give priority to explore and develop gas enterprises for industrial and power generation facilities against Crude Oil
 - Promotion of Downstream Industry opportunities to mitigate dependency on Basic Industry only, relying on limited primary resources

The Saudi Electricity Market and IWPP opportunities

Investment Needs and Requirements / 2 /

- All facts combined result to the challenge to comfort both
- Maintaining / Reinforcement of International competitiveness of Saudi Industry and
- Security of domestic welfare of KSA

The Saudi Electricity Market and IWPP opportunities

Investment Needs and Requirements / 3 /

- Thus, KSA is confronted with the challenge to cover increasing demand on Electricity in the future (and Energy in general) as investigations predict that new Power Generation
- Plants with an overall capacity of 66 GW (around 300 TWh, or 40 GW excess energy) must be in place until 2020 and in parallel demand on Potable Water will increase by 50 %
- In order to meet increasing demand on Potable Water additional investment in Desalination Plants (SWCC), Power Plants, IWPP and associated infrastructure will require around 150 billion USD until 2020*
- Since financial resources of the Energy Sector are limited, KSA to promote private equity participation in infrastructure projects to tackle this challenge and to establish a more efficient sector

*Combined figure for Power and Desalination Projects as per Saudi Arabia Country Analysis Brief/ Dec. 2003

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The Saudi Electricity Market and IWPP opportunities

Over the past 5 years the Saudi Energy Policy experiences a tremendous change.

New laws and regulations were set into force or are on the way to speed infrastructure investments with the help of the

Private Sector

The Saudi Electricity Market and IWPP opportunities

Regulatory Framework / 1 /

- Decision 169 of the Council of Ministers dated **11/8/1419H** (November 30, 1998)
 - Establish SEC through a merger of existing companies in KSA
 - SEC was established on April 5, 2000 from a merger of 10 regional companies, serving the wholesales electricity demand of KSA
 - SEC is still largely state owned; private stake in the joined company is 10 % whereas Saudi Aramco keeps a share of 4,5 % of the total
 - SWCC contributes 10 % of electricity demand (27 GW in 2001) and covers 4 % of overall water production (Desalination Capacities)
 -
 - Proposed rules for an Independent Regulatory Authority Body
 - Establishment of the Saudi Regulatory Authority (SERA) on 27/8/1422H (November 13, 2001) that set and monitors the tariffs applicable for the Industry Sector (absorbing around 25% of energy dispatched as per records of 2002)

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Regulatory Framework / 2 /

- Investment Allowance
- Domestic and international investors may invest in power projects
- KSA donates exemptions from custom duties and promotes concessionary financing by the Saudi Industrial Development Fund (SIDF) which may cover up to 50 % of capex
- Introduction of the new foreign investment law promoting 100% ownership of privates in projects also supported by low interests loans donated by SIDF
- Taxes on profits were reduced from 45 to 20 %

The Saudi Electricity Market and IWPP opportunities

Regulatory Framework / 3 /

- Investment Allowance
- Establishment of the Saudi Arabian Investment Authority (SIGA) responsible to issue investment licenses and to be the single contact for investors

The Saudi Electricity Market and IWPP opportunities

Regulatory Framework / 4 /

- New Utilities
- In 1999, Marafiq was formed offering infrastructure services (electricity and water) to the twin cities Jubail and Yanbu. The company was formed by SABIC, Saudi Aramco, the Royal Commission of Jubail and Yanbu the Government and the Public Investment Fund
- Marafiq is adding around 910 MW to the Electricity Market

The Saudi Electricity Market and IWPP opportunities

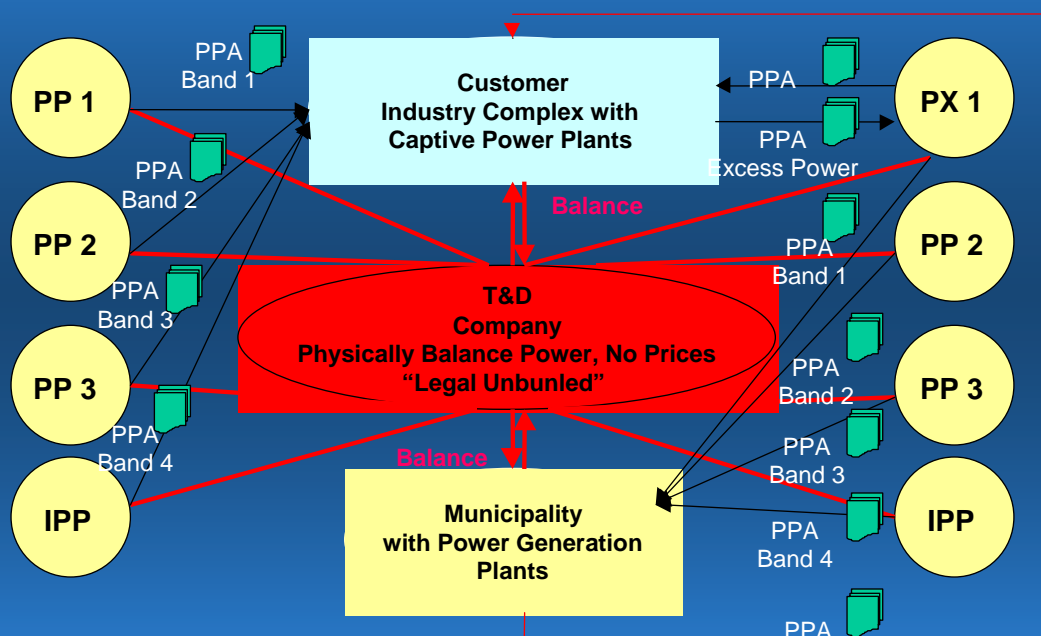
Regulatory Framework / 5 /

- Unbundling
- In February 2003 the Supreme Economic Council initiated the first step to unbundle the vertical integrated structure of SEC. T&D sector was opened for domestic and foreign investment

The Saudi Electricity Market and IWPP opportunities

Regulatory Framework / 6 /

Multi - Buyer, Multi Seller Market as per 2004 in the EC



- Customers (Industry & Municipality) opt to purchase and sell power as per terms and conditions of individual PPA
- Spot Power and Bands may be sourced by the PX as part of Portfolio Management
- — physical power supply routines; PPA: Power Purchase Agreement
- PP: Power Plant; IPP: Independent Power Producer; PX: Power Exchange

The Saudi Electricity Market and IWPP opportunities

Regulatory Framework / 7 /

	Sector Policy	Sector Regulation	Unbundling	PSP	Privatisation
Abu Dhabi	ADWEA	Regulation and Supervision Bureau WES	TSO, MO, D&R	G: Greenfield (BOO)	G: existing assets (nearly completed)
Saudi Arabia	Ministry of Industry and Electricity	Electricity Sector Regulatory Authority (ESRA)	G: (SEC, SWCC), MO (WEC), TSO, D, R	G: IPP, IWPP (planned) Industrial Plants: (Sadaf, Saudi Aramco)	planned
Oman	MHEW	Regulatory Authority	G (3), MO, TSO, D&R (3), RASC	G: Greenfield (BOO); Industrial Plants; Concession	planned for all assets D&R: Salalah concession
Qatar	MEI	Kahramaa	Kharamaa (TO, SO, MO), D&R		G: existing assets
Bahrain	MEW	planned	planned	IPP – presently in process (BOOT)	Planned

G = Generation (Power, Power and Water, Water)
 TO = Transmission Owner
 SO = System Operator
 MO = Market Operator / Single Buyer

D = Distribution
 R = Retail
 BOO (T) = Build, Own, Operate (Transfer)
 WES = Water and Electricity Sector
 RASC = Remote Area Service Company

Deregulation in the Middle East

Source: FICHTNER

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Market Structure, Key Players, IWPP Regime / 1 /

➤ SEC and SWCC still maintain the position of a dominant key player in Power and Water Generation and Distribution

➤ Installed Generation Electricity Capacity (as per 2003)

➤ SEC 25,5 GW

➤ SWCC 2,9 GW

➤ in September 2003, SEC already announced the Project Development of 7 new Power Plants with a total of 14,7 GW added by 10 new Power Transmission projects

➤	Mzahmyah	1725 MW	Central
➤	Rabigh II	2400 MW	Western
➤	Qurayah II	3600 MW	Eastern
➤	Sulbokh	1725 MW	Central
➤	PP10	2400 MW	Central
➤	Yanbu II	2400 MW	Western
➤	Shuqaiq II	600 MW	South

➤ Source: SEC / Saudi Aramco / Arabnews

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The Saudi Electricity Market and IWPP opportunities

Market Structure, Key Players, IWPP Regime / 2 /

- SWCC concentrates its activities on Dual Purpose / Co - Generation Plants
- SWCC operates 24 plants at the West Coast and 6 plants at the East coast with a total capacity of Potable Water of around 3.4 Mio. m³ / day in 2003
- Since some of SWCC Desalination Plants are expected to be decommissioned within the next 10 year (provided refurbishment will not apply) and given the fact that water demand will increase significantly
- Thus, KSA is heavily relying on attracting private capital to close the cap.

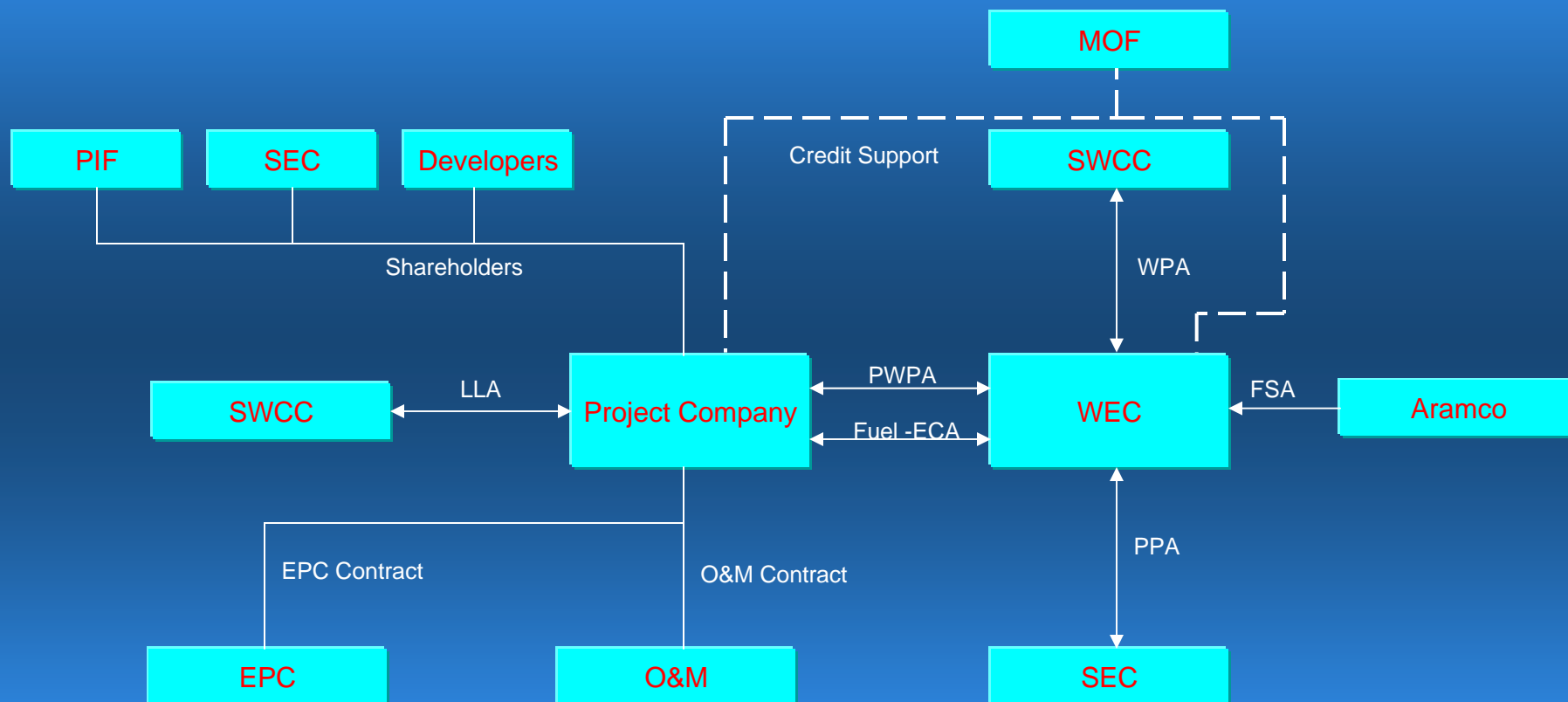
The Saudi Electricity Market and IWPP opportunities

Market Structure, Key Players, IWPP Regime / 3 /

- New IWPP were set up under cooperation of SWCC
- In 2002 the Supreme Economic Council issued new guidelines that stipulate the boundary conditions how IWPP will work.
- As an integral part SWCC and SEC to create an offtake company to concentrate on Co- Generation leading to the Implementation of the Water and Electricity Company (WEC) to promote private financed IWPP
- The Power Regulator takes over responsibility on both Water and Electricity Generation until a Water Regulator is in charge
- In April 2003 the Ministry of Water and Electricity was formed (MWE)

The Saudi Electricity Market and IWPP opportunities

Market Structure, Key Players, IWPP Regime / 4 /



Contractual and Physical interactions of IWPP implementation as per MWE

Source: MWE

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Market Structure, Key Players, IWPP Regime / 5 /

- In terms to this challenge, the focus is turned to multi - financed IWPP projects

- **Shoaiba** IWPP (Western Province) was launched in 2003 that will generate 700 MW electricity and 175 million gallons of water per day
- Shoaiba to be followed by
- **Shuqaiq** (Western Province),
- **Raz Azzur** (Eastern Province) and
- **Jubail** (Eastern Province)

The Saudi Electricity Market and IWPP opportunities

Market Structure, Key Players, IWPP Regime / 6 /



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The Saudi Electricity Market and IWPP opportunities

Market Structure, Key Players, IWPP Regime / 7 /

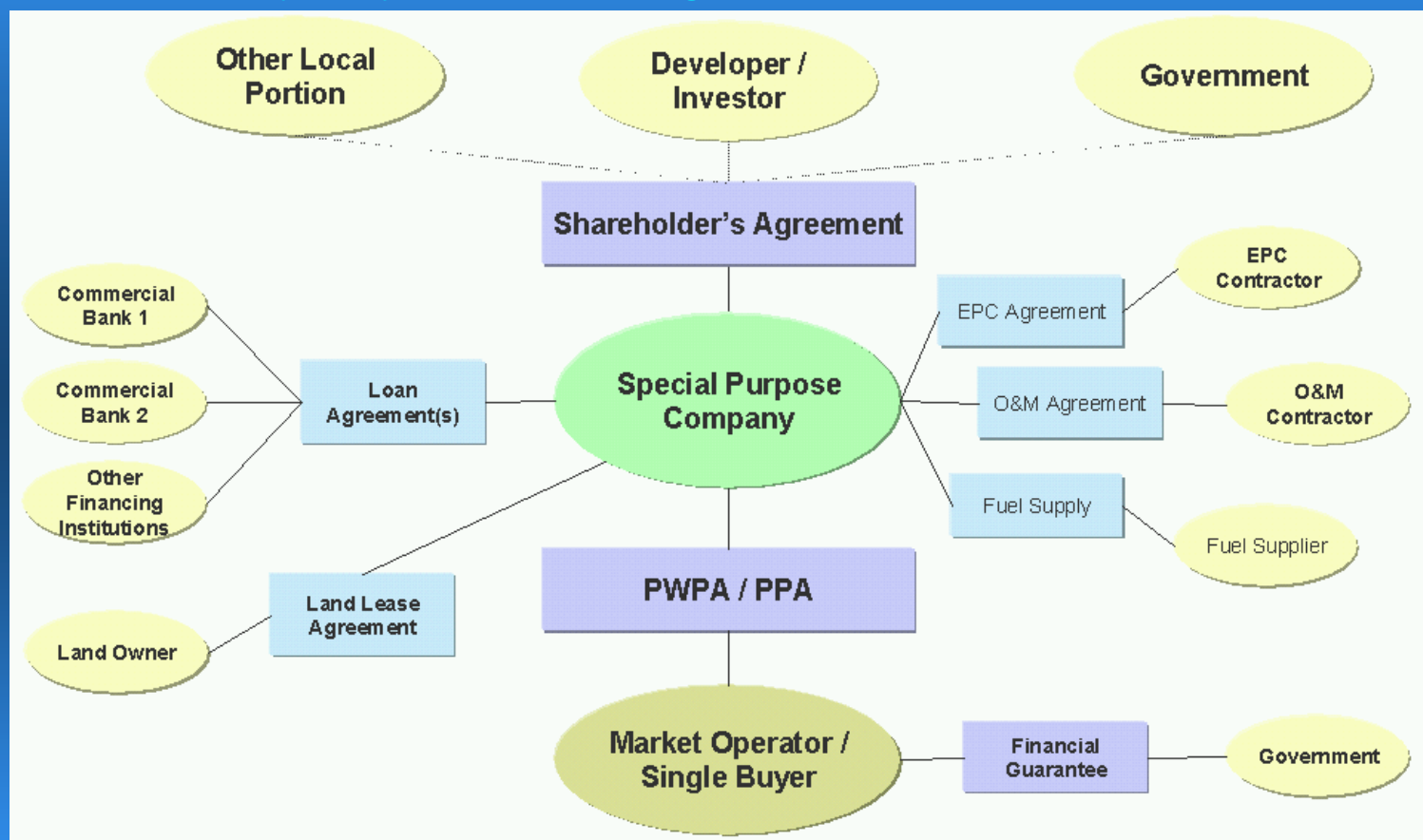
- Saudi Aramco, SABIC and SADAF forming the major group of driving forces in power generation enterprises (captive plants)
- In July 2003 the first IPP in KSA (the SADAF Co- Generation project) reached final approval. The Co- Generation Plant will be owned by the Jubail Energy Company (JEC) in which CMS has a stake of 25%.
- Saudi Aramco launched new projects at

➤	Ras Tanura,	150 MW / 645.000 lb/h
➤	Juaymah,	300 MW / 1.250.000 lb / h
➤	Uthmaniyah	300 MW / 1.250.000 lb / h
➤	Shedgum.	300 MW / 1.250.000 lb / h
- All projects reached Financial Close in 2003
- International Power equity commitment: around 35 Mio. €uro according to 60% project share (Developer, ownership and operator)
- Saudi Oger owns 40 % (Construction, ownership, O&M)

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The Saudi Electricity Market and IWPP opportunities

Market Structure, Key Players, IWPP Regime / 7 /



Typical Project Structure of IPP / IWPP implementation

Source: FICHTNER

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Key Challenges / 1 /

- Sector Policy and Institutions
 - Energy policy to reflect growth of KSA economy under limited financial resources in particular, to encourage long term private sector investment:
 - The legal and regulatory framework and existing tax regimes to be further developed
 - Legislation and entities involved to proceed in establishing of bidding processes offering high transparency of regulations and interactions on international accepted standards
 - Establishment of an Independent Regulatory Body to set and monitor tariffs for electricity and water. SERA is still dominated by government representatives. This is one of the primary precondition to attract private capital
 - The role of various institutions such as SERA, MWE SWCC, SEC, Marafiq to be more transparent
 - Secure of political stability

The Saudi Electricity Market and IWPP opportunities

Key Challenges / 2 /

- Energy Conversion and Tariffs
- General energy conservation tasks to save primary resources such as fuel and water
- Repowering / Revamping of existing SEC / SWCC Power and Desalination Plants in compliance to energy conservation strategies to maintain competitiveness against new private high efficient enterprises
- Re- design, extension and interconnection (GCC) of existing T&D (GCCIA issue)
- Interconnection of domestic / regional Transmission Grid
- Secure availability and service level of power
- Abolishment of existing cross- subsidy mechanism
- Introduction of a transparent tariff scheme for electricity and water reflecting the actual costs of generation and distribution
- Introduction of legal and regulatory frameworks to promote energy and water production at least cost and lowest tariffs

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Conclusions

- Population will reach around 39 mio. people in 2020
- Industry growth pulls energy needs resulting to redesign the entire energy infrastructure
- Average growth of Energy demand around 5 % p.a. Potable Water demand to reach
- 5 Mio m³/d in 2020
- There is an urgent need to source private capital for the energy sector to secure predicted growth of Saudi economy
- KSA to proceed to establish a bidding process offering high transparency following international experienced standards
- KSA to proceed to create legal and fiscal boundary conditions sufficiently sized to attract private capital investments on a long term basis (win- win chance)