

ANNUAL WORK PLAN 2010 and 5-YEAR SECTOR TIMELINE 2010 - 2014



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This publication is aimed at an informed reader; that is, someone who is familiar with the water, wastewater and electricity sector.

The Bureau's publications, which include regulations, annual reports and consultation documents, are available in PDF format for free download from our website (www.rsb.gov.ae).

Statement of intent

The structure of our Annual Work Plan for 2010 has changed in terms of content and presentation and has been broadened to include the introduction of Key Strategic Initiatives and Directional Targets.

Part 1- Key Strategic Initiatives

We are to initiate a number of key strategic projects which may have an impact on the Sector in the future. These projects are sponsored directly by the Bureau but, in most cases, will require the co-operation of various licence holders. Costs, where incurred, will be allocated to the Sector, rather than individual licence holders.

Part 2 – Five-year timelines

This shows how the Sector intends to meet demand requirements for water, wastewater and electricity over the next five years.

Part 3- Directional Targets

We intend to continue our directional approach to licence holders, by the issue of Directional Targets. Such targets seek to provide for improvements and are issued under our supervisory powers. Progress on these will be reviewed quarterly with the affected licence holders.

Part 4 – Annual work streams

These form the bulk of our work and are more concerned with operational/ regulatory matters rather than strategic ones.

Overall the Sector is and will be involved in almost all aspects of the expansion of the Emirate of Abu Dhabi; from accommodating nuclear power stations on the electricity network to the small-scale generation of renewable energy, possibly in customers' premises. Whether new desalination techniques, small wastewater treatment plants, irrigation standards or use of recycled or grey water, everyone is touched by something the Sector does.

As a result, our work both within the Sector and the greater community, takes on an increasingly important role in ensuring we provide suitable regulations and guidance in our ever changing environment. Consequently, this publication seeks to set direction and reassure all stake-holders that the Sector is at the forefront of providing support to the Government of Abu Dhabi in all that it seeks to achieve.

Welcome to our 2010 Work Plan.

Nick Carter

Director General

PART I



Key Strategic Initiatives

Key Strategic Initiatives

1. Reliability of bulk power

In line with other technology-advanced countries, we are to establish an Abu Dhabi electric power reliability centre (EPRC).

The Centre will be under the control of the Bureau and will co-ordinate submissions from ADWEC, TRANSCO, and other UAE power and water production and utilities companies.

An annual forecast of Summer Reliability Assessment will be produced by the first quarter of every year. The Assessment will provide the Government with a detailed overview of the Sector's robustness, including demand forecasts, reserve margins and primary fuel supplies availability.

2. Variable generation

As the Emirate adopts many new generation strategies and seeks to diversify away from 'traditional only' generation, the need to integrate variable generation such as solar or wind power is important. Variable resources are fundamentally different to fossil-fuel resources in that their primary fuel (solar, wind, etc) is not storable (gas or oil are).

Therefore, TRANSCO and the distribution companies will be required to adopt a different approach to the control and operation of large-scale variable generation over the coming years.

The Bureau's role in this area is to ensure that suitable probabilistic models and control systems are established by TRANSCO, AADC and ADDC, and that grid distribution access codes are modified to reflect this new reality.

3. Carbon accounting

We intend to study the Sector from a carbon emission perspective. Initially, we will undertake a Scope I carbon survey of the RSB's activities and seek to expand this to other sector companies.

Scope I carbon accounting deals with the direct carbon (CO₂) generated by an organisation, such as energy or vehicle usage.

Understanding the key producing elements of carbon is an essential step in seeking to reduce CO₂ and other greenhouse gases emissions.

4. Supporting 2030

We intend to publish our 2030 strategy supporting plan which will mesh in with the Government's 2030 Strategic Vision. The plan will take account of new technologies such as nuclear power and renewable energy targets, smart grids and trends in modern water management techniques. It is a blue print for support but, like all plans, will need to react to changes in the Emirate and to the introduction of differing technologies.

The Plan will be reviewed annually.

5. Water usage

It is often printed that the UAE has a high per-capita water consumption. However, of the total water delivered to the transmission system less than 20 percent is 'Returned to Sewer' (RTS). In effect, this means the other 80 percent ends up on the ground, mainly through irrigation. Such low RTS values are not in line with our strategy of seeking to meet the Singapore water standards of RTS which are much higher.

For 2010, we will seek to fully understand and track all aspects of drinking water usage with a view to reducing waste wherever possible and looking at smarter irrigation systems.

6. Demand Side Management (DSM)

DSM provides a range of options for indirect load control (by customers reducing load for example) to load-cycle interruptions such as dynamic response using in-built devices for disconnecting large loads, such as air conditioning, at critical peak power times.

Therefore, DSM, smart grids and variable generation all have an impact on grid stability and generation expansion.

Currently, DSM research is being undertaken by the Executive Affairs Authority (EAA). However, given the importance of reducing peak-load quickly, the RSB will seek to fast-track two aspects of DSM namely:

1. Dynamic response
2. Peak reduction management

These two work-streams can be implemented by the Sector fairly quickly and still leave the EAA work unaffected.

Our goal in this area is to seek to "Shave" 250 MW off the system peak by the end of 2012. This would equate to a reduction in peak of some four percent.

7. Smart grids

Smart grids consist of a wide range of elements such as smart (electric) metering, wireless links, distributed or embedded generation and storage devices (e.g. capacity storage).

Like all complex systems, smart grids work well when fully integrated and we intend to work with all affected licence-holders to produce a range of operating and connection standards to be known as "Smart Grid Operating Codes and Standards"

A consultation document will be produced this year.

8. Smart metering trials

Over the past few years, both AADC and ADDC have been installing electronic meters, initially for automatic meter reading (AMR) purposes. However, the potential uses of these meters exceeds AMR and they could form the basis for a range of smarter solutions in terms of tariffs and power purchasing options – thereby driving down demand and system peaks.

Over the coming year we intend to sponsor two trials with the distribution companies.

1. Energy purchasing trials

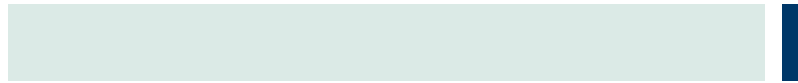
A sample number of volunteer customers will be provided with electronic displays to enable them to utilise “Time of Day” electricity pricing. For example, buying electricity in the evening would be cheaper than in the afternoon. Customers living in large premises will form the main sample. This work will build on the trials recently undertaken in Singapore.

2. Pre-payment schemes

The energy costs associated with flat occupancy tends to be fairly constant, given most air conditioning is central and paid by landlords. The “cost to serve” such customers by a distribution company are high, compared with a customer’s income.

Therefore, we intend to work with one of the companies to install pre-paid meters in a number of premises (flats). The trial will last for at least a year and will provide an opportunity to look to install pre-paid meters, as a norm, in high-rise buildings.

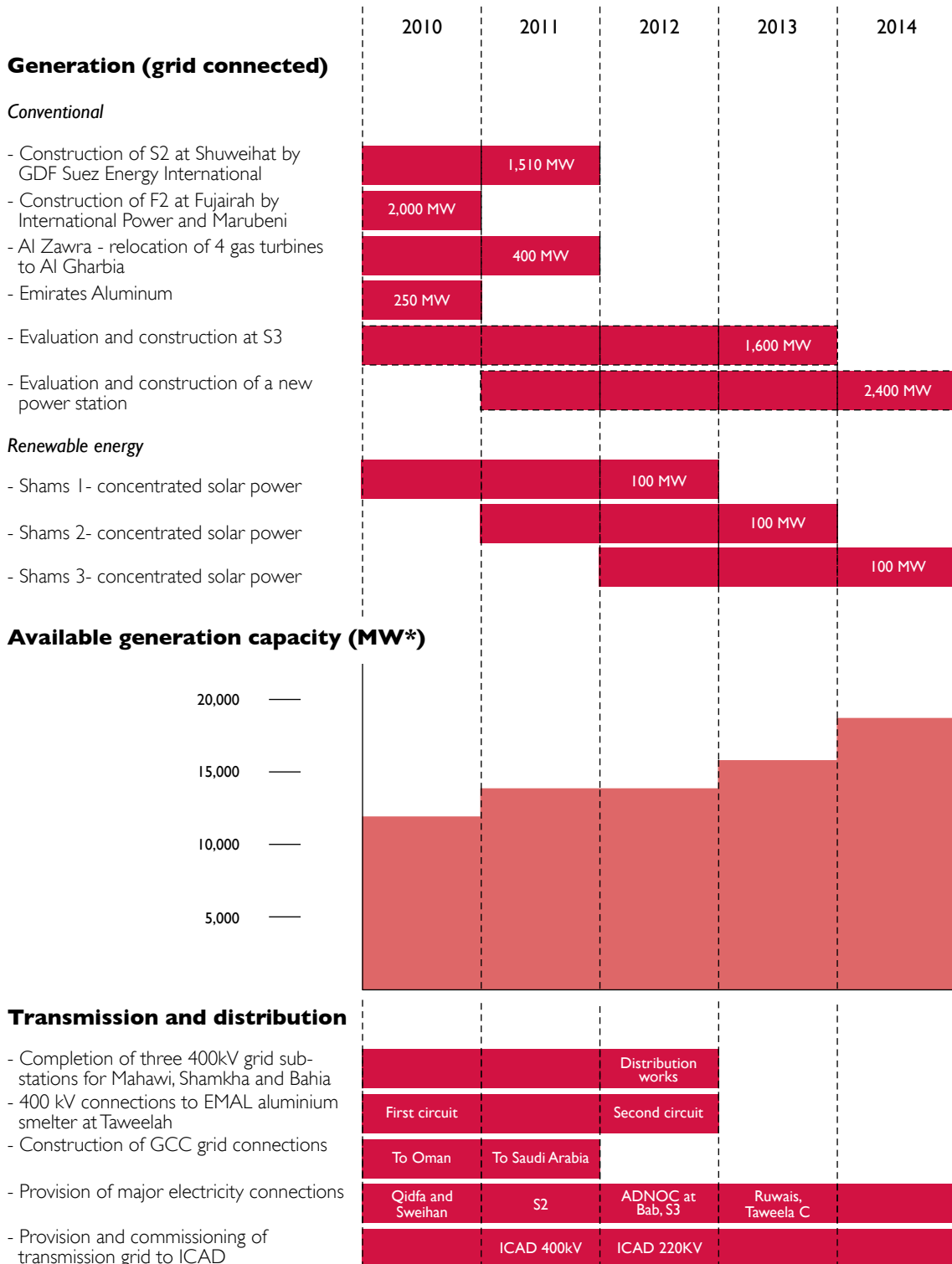
PART 2



Five-year timelines

Five-year timelines

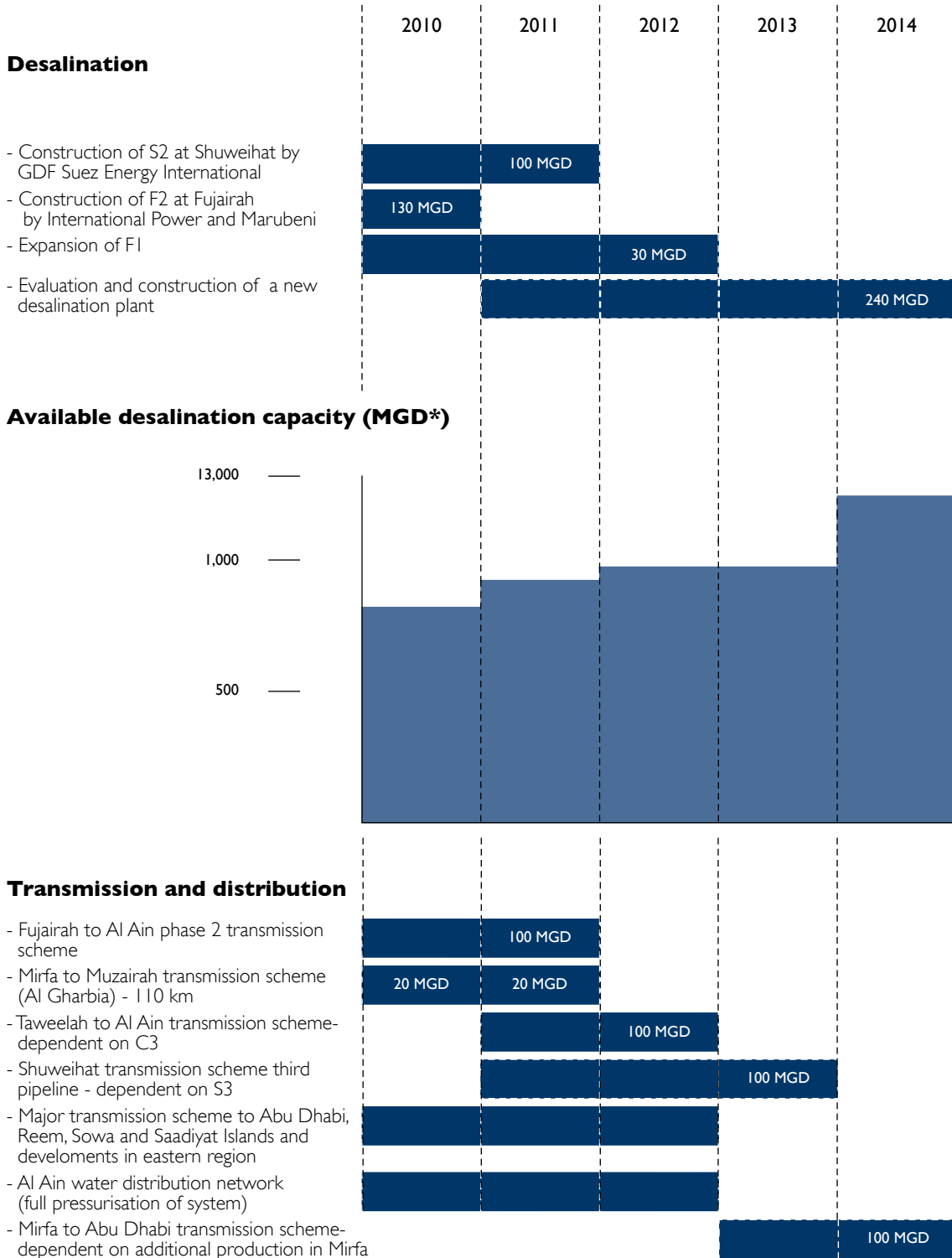
Electricity



All figures approximate
 * MW = megawatt

Sources: ADWEC – Statement of Future Capacity Requirements 2009 - 2030
 TRANSCO's 2009 Five-year Planning Statement (2010 – 2014)

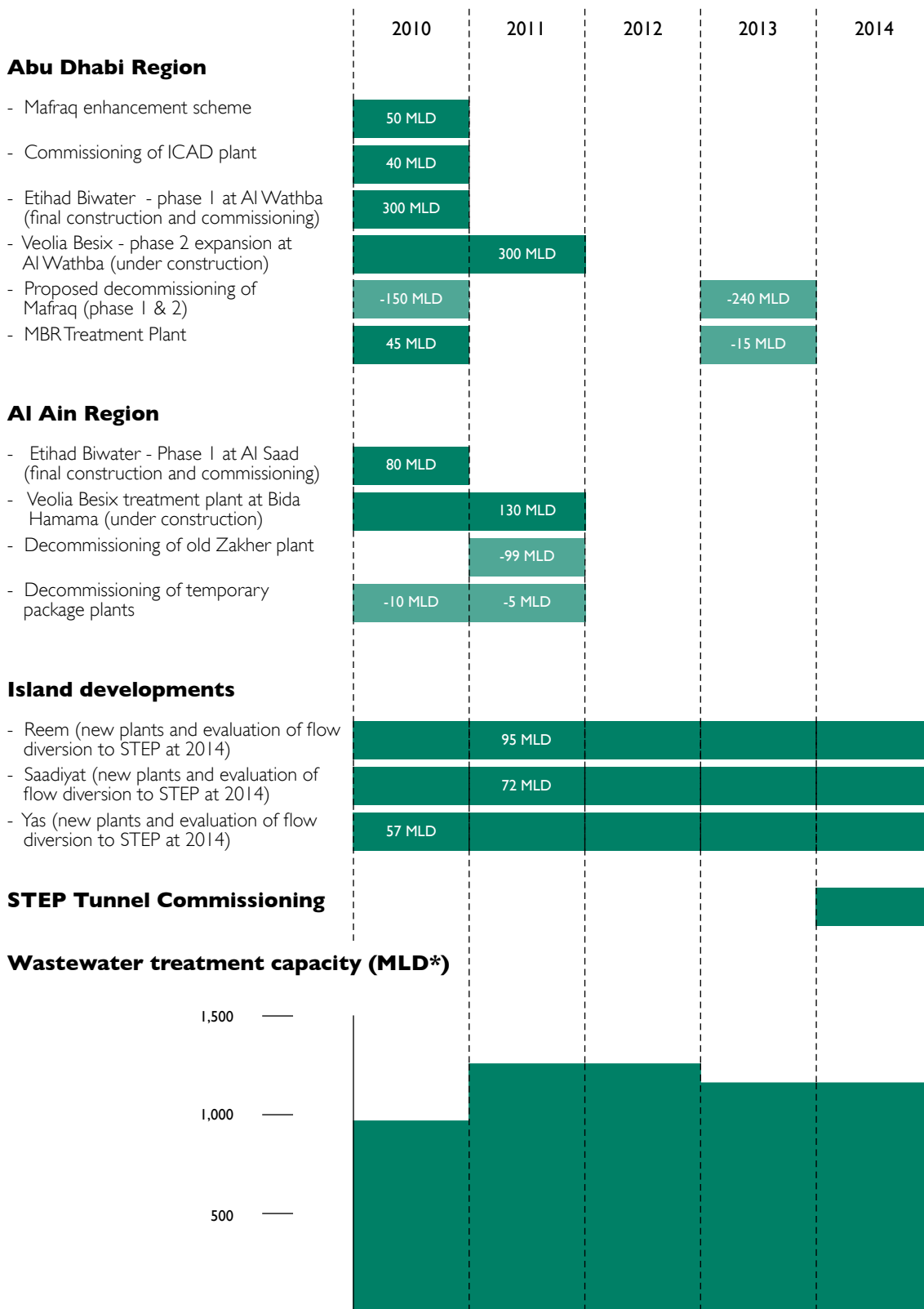
Drinking water



All figures approximate
 *MGD = million gallons per day

Sources: ADWEC – Statement of Future Capacity Requirements 2008 - 2030
 TRANSCO's 2009 Five-year Planning Statement (2010 – 2014)

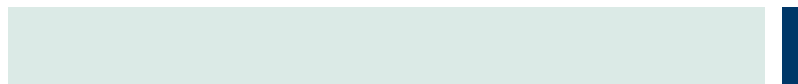
Wastewater



All figures approximate
 *MLD = megalitre per day

Source: ADSSC's Five-year Planning Statement 2008 and 2009

PART 3



Directional Targets

Directional Targets

The targets listed below are directed at licence holders and will be encouraged using our supervisory powers as defined in law.

1. Improve OPEX performance

AADC, ADDC

Both distribution companies have much to do in order to drive their operational expenditure (OPEX) so as to be in line with more acceptable global performance measures.

Therefore, we are seeking substantial improvements in two areas: 'cost per customer' and 'cost per unit delivered'. Our view is that both companies could reduce their costs by 30 percent in real terms over the next four years.

2. Payment schemes to customers

AADC, ADDC

Offering a range of payment options benefits both customers and distribution companies as it makes paying bills easier. It reflects a distribution company's commitment to customer service.

In 2009, both distribution companies introduced two new payment options using credit cards: online and phone payment. This adds to the existing payment options (in person at service centres, by post and through banks) and compliments the existing payment arrangements available to customers experiencing payment difficulties.

We aim to focus the distribution companies' efforts for 2010 on expanding bill payment centres to everyday places such as supermarkets, post offices and service stations and bill smoothing payment arrangements, such as payment cards.

3. Full pressurisation of water network

AADC

At present, some 30 percent of AADC's customers and 10 percent of ADDC's customers receive an intermittent supply of potable water. Full pressurisation, to a minimum head of 12.5m, in a water network is necessary to ensure compliance with water quality requirements and to provide wholesome and continuous supplies of water. The present need for ground and roof storage will be greatly reduced, or eliminated for some building types, when full pressurisation is achieved. This will in turn maintain the high quality of water delivered within the building.

Full pressurisation is therefore a critical area for network system improvement and should be met by the end of 2012.

4. Complete all MDEC interface metering

TRANSCO, AADC, ADDC

The Meter and Data Exchange Code (MDEC) defines the minimum standards for interface metering between licensees. Compliance with this code has been a requirement since 1999. Licensees have been slow to upgrade their metering systems and there still remains some nine percent of electricity meters and 35 percent of water meters which still do not meet the standard as defined in MDEC.

We will seek to ensure all interface metering between licensees is to MDEC standard.

5. Leakage reduction

AADC, ADDC

Understanding water loss and unaccounted for water remains a challenging area for distribution companies but provides an opportunity to improve the performance of their network systems and save a valuable resource. Accurate and comprehensive flow metering on distribution input and consumption volumes on a zonal basis is a pre-requisite to understanding leakage.

AADC and ADDC are required to report on water losses using the International Water Association (IWA) template. Once losses are understood and accurately measured, active leakage control measures can be implemented and the volume of leakage reduced.

An acceptable level of leakage for the age, type and design of this network system is set at 10% on the distribution input volume. This shall be achieved by the end of 2012.

6. Remove water transmission constraints

TRANSCO

Transmission constraints have existed in TRANSCO's network for many years: the outcome is chiefly observed in the intermittent water supply service in Al Ain.

Transco shall re-enforce the transmission system at key locations such that all supply constraints for current and future demands are removed by the end of 2011.

7. New supply licence for ADWEC

With the change in law following the issue of Law No (9) of 2009, the Bureau can, subject to terms, issue supply licences to other entities operating in the Sector.

Therefore, we foresee a position whereby ADWEC (the Single Buyer) could be issued a supply licence, allowing them to sell directly to major customers connected to the transmission system. Currently, the system is cumbersome in that only distribution companies sell to customers. This also applies to large users who are not connected to a distribution company's network.

We will seek to ensure the above is completed before the end of 2010.

PART 4



Annual work streams

Annual work streams

Customer support

Customer Metering Regulations

A review of the application of the Customer Metering Regulations 2003 will be carried out. It will focus on the need for a policy on remote meter reading (AMR meters) and prepayment tariffs (including facilities for automatic disconnection / re-connection).

Customer service licence conditions

In 2009, the Bureau led a Customer Services Working Group, which included participants from both distribution companies. Its purpose was to address outstanding deliverables under distribution and supply licences, e.g. to prepare and issue a Code of Practice on Disconnection for Non-Payment. We will continue this collaborative approach in 2010 to ensure compliance with all customer-focused licence conditions.

Regulatory guidelines for new connections

Many issues and concerns have been raised due to poor clarity in, and standards for, the design of connections to distribution networks. These include network boundary issues, asset ownership and handover; metering and operational control, and require clear guidelines and standardisation of connection types. In addition, the distribution companies have made little progress towards implementing the methodology of connection charges we proposed in our 2008 consultation document. We will therefore issue a regulatory guideline which will define the principles, methods and steps to be taken when making new connections.

Strengthen and monitor customer service standards

An independent audit of the distribution companies' compliance with the guaranteed customer service standards was completed in 2009. The scope of the audit covered internal processes for the recording and reporting of data to the Bureau, as set in the standards, together with their level of performance against the standards.

Following a review of the auditors' report and consultation with the affected companies, we intend to provide assistance with the development and enhancement of existing internal processes. This should provide for more accurate reporting to the RSB on the companies performance against the standards.

We will also implement any consequent amendments to the Code of Practice on Guaranteed and Overall Service Standards plus continue to monitor the companies' performance in this area.

Production

Efficiency Improvement Project - ECPC plant modification

In 2009, ECPC undertook a project to improve plant efficiency by recovering further heat at the exhaust of the Heat Recovery Steam Generator (HRSG), to supply low-pressure steam that could be used at the desalination plant. We will study this project, its objectives and potential advantages, and establish whether such a modification could benefit other IWPPs.

Electronic Dispatch Logging (EDL)

TRANSCO has introduced a mechanism whereby instructions to generation/desalination units are sent electronically instead of being given by telephone. We will review the implementation of EDL at a selected site and establish how effective such a system is at both ends, i.e. at the plant and at TRANSCO.

Plant maintenance regime

In order to ensure a secure and uninterrupted power system, regular plant maintenance is essential. We will review the maintenance regime and procedures of a selected power plant to identify the benefits and disadvantages of such a programme. We will also explore potential improvements that could maximise reliability and availability.

Review of Economic Dispatch

TRANSCO has an obligation under its licence to ensure the economic dispatch of production plants in the Emirate. This means that they should be dispatched in such a way as to minimise the costs (including fuel costs) paid by the single buyer (ADWEC) to the production companies under the power and water purchasing agreements (PWPAs), taking account of factors such as plant availability and transmission constraints.

Given that production costs in 2008 amounted to AED 7 billion, even a small improvement in the efficiency of the dispatch decisions could have a significant impact on sector costs. The review will also examine the efficiency of the dispatch process in circumstances where gas supply constraints require production plants to operate on back-up fuel.

Electricity

Capital expenditure (capex) on network performance

The reliability of transmission and distribution networks is monitored by key performance indicators, which are externally audited and linked to the price controls. We will consult on a new procedure which will require companies to make specific expenditure provisions for targeted network performance improvement programmes.

Demand forecasting procedures implementation

Following consultation on the Bureau's proposed demand forecasting procedures in 2009, we will work with the sector companies to implement improved processes to address weaknesses and inaccuracy in demand forecasts. This will be based on demand assessment data collected in 2009.

Design standard for 22kV systems (protection)

Distribution companies are developing a number of 22kV networks and, given their large capacity, special consideration needs to be given to security designs. We will propose an enhanced security standard for 22kV networks using 'unit' protection in a consultation document. This design standard will eventually be issued as an Annex to the Distribution Code.

Electricity Wiring Regulations – training and registration

This training began in 2009, and we will continue to monitor the courses being conducted by two training companies. We will also oversee examinations and issue Registration Certificates for electrical engineers, whose names are recorded in the Bureau's database and listed on our website.

High voltage (HV) assets - operational training

Currently there is little or no control of the competency level of staff responsible for operating HV assets in customers' premises (e.g. factories, shopping malls, district cooling plants). We will identify a suitable training programme and issue requirements for staff to be authorised to operate and maintain HV assets.

Transmission Code amendment - Renewables

The Transmission Code will be reviewed to address requirements for the connection and operation of embedded generation, particularly renewables, which operate on base load and cannot contribute to reserve capacity requirements. This work will be undertaken through the Transmission Code Review Panel.

Additional work streams

- Audit of TRANSCO's operational procedures
- Review of existing HV customer connections
- TRANSCO's and distribution companies' five-year planning statements
- Protection Systems Review – distribution
- Distribution Planning & Design Standards

Health, safety and environment

ADSSC review

During 2009, an external organisation performed a Health and Safety Review and produced a comprehensive report with prioritised recommendations. The Bureau (HSE and Wastewater teams) will monitor the implementation by the Abu Dhabi Sewerage Services Company (ADSSC) of the recommendations in the report.

Health and safety management and operational reviews: TRANSCO, ADDC and AADC

We intend to undertake a review of licence holders practices and procedures relating to health and safety management, and identify areas for improvement. These reviews will compare licensees' performance against utility best practice, and will allow the development of a list of recommendations leading to improvements in performance.

Personal Protective Equipment Regulations

Reviews of recent accidents in Sector companies highlighted the inconsistent use of personal protective equipment (PPE), both by company employees and contractors. Although the Sector's Safety Rules require the use of PPE, they lack detailed guidance on specific job requirements and the specification of equipment. We will work with licensees to develop PPE Regulations for the Sector; which will define the quality and selection of such equipment, and its use in protecting all employees and contractors.

Streetworks and Access Regulations – Code of Practice

The Sector's network companies have assets located underground in public and private areas throughout the Emirate. Licensees have developed various procedures with the relevant government agencies to address the issues associated with permitting network companies to gain access to their assets for operational purposes.

During 2010, we will consult with all licence holders and the relevant agencies before finalising and issuing a Streetworks and Access Regulations Code of Practice for the Sector.

Drinking water

Bio-fouling control at seawater intakes – detailed research

An internal bio-fouling control study in 2009 recommended that further assessment of alternative bio-fouling control methodologies should be carried out by an experienced external consultant or research body. Recommendations on the feasibility, cost and benefits of alternative bio-fouling control solutions for the UAE will be published in due course.

Chlorination system evaluation

The Report on the Bromate Source and Reduction Study advised that better management controls are required for the chlorination systems from the production plants to the customer, in order to ensure that the formation of Bromate is minimised and that levels comply with the Regulations. The Bureau commenced with an audit of the chlorination management systems in October 2009. Efficiency evaluation will be a critical element in the process of maintaining the reduction of Bromate formation throughout the supply chain.

Fire-fighting Management Systems

In 2009, the Urban Planning Council (UPC) sought the Bureau's involvement in implementing a world-standard fire-fighting management system across the Emirate, and in particular for the mega developments envisaged in their "Plan Abu Dhabi 2030".

We have undertaken preparatory investigations in outsourcing a study to specialised consultants. In collaboration with the UPC and the Civil Defence, it is envisaged that the project will progress in two stages: firstly a study of current practices and recommendations for improvement, and secondly implementation of the recommended options.

Water quality: total dissolved solids

Following post-treatment modifications to remove seawater blending (which was found to contribute to Bromate formation) at the production facilities, there was a reduction in the natural levels of total dissolved solids (TDS). The Bureau intends to investigate the feasibility of meeting the TDS prescribed value in the Water Quality Regulations.

Water supplied by commercial tankers

A considerable number of consumers receive their potable drinking water supplies by road tanker. This can be for a variety of reasons and purposes. Road tankers are owned and operated by private and commercial entities, some leased to the distribution companies for designated contracts, and some operating privately. We intend to explore all the issues concerning tankered water supplies with all stakeholders and implement a safe, secure and efficient system which safeguards the needs of all legitimate consumers.

Additional work streams

- Compliance with Water Quality and Management
- Compliance with Water Supply Regulations

Wastewater

Grey water

A number of developers in the Emirate are considering the use of grey water technologies for localised treatment and reuse of wastewater from baths, showers, washbasins and washing machines. We consider grey water collection, treatment and reuse as regulated activities requiring a licence.

Therefore, in the interests of public health and environmental protection, water quality for reuse purposes will be subject to the Recycled Water and Biosolids Regulations, to be published in 2010. Accordingly, we will conduct a review of the impact of grey water treatment, considering issues such as available technologies, Emirate practice, quality risks, licensing issues and impact upon downstream infrastructure. This project may lead to field-based studies and sampling programmes which will provide a greater understanding of the risks associated with the use of recycled water.

Issue Regulations on Trade Effluent Control, Recycled Water and Biosolids

Following a public consultation in 2009, we will revise the draft Regulations as appropriate and issue the final Regulations during 2010.

The Trade Effluent Control Regulations will set a framework for the safe, economic and sustainable collection, treatment and disposal of industrial wastewater produced in the Emirate.

The Recycled Water and Biosolids Regulations will set quality standards and provide guidance for treated sewage effluent or recycled water and biosolids reused in the Emirate. This work plan project will also involve work with licensees to develop reporting requirements and compliance programmes.

Recycled water sampling programme

Following recommendations from the interim Regulations Review Panel, we intend to manage a project to monitor the quality of recycled water from the point of production to the point of use. The project will run for a 12-week period; its aim is to discover whether there is any degradation in water quality throughout the network. The final draft of the Recycled Water and Biosolids Regulations will incorporate the findings of this project.

Additional work streams

- Sector Codes
- Security Standards
- Wastewater licence application process review

Economics

Interruptible tariffs for customers

Due to the extreme UAE summer climate, and the associated widespread use of air conditioning, the Sector experiences very high peak electricity demand in the summer in comparison to annual average electricity demand. As it is peak demands that drive the need for additional investment in electricity production and transmission capacity, significant benefits can be derived from providing customers with an incentive to reduce their power demands during system peaks.

One means of providing such incentives is via “interruptible tariffs”, whereby industrial customers who have some flexibility within their production processes can be provided with payments or refunds or lower tariffs during off-peak periods in return for allowing the system operator to reduce or interrupt their electricity demand during system peaks. We intend to develop this approach more.

Annual review of Large-User Tariff

Customers with demand in excess of 1 MW are entitled to apply to the distribution companies (AADC or ADDC) for a large-user tariff. Such tariffs are required to be cost-reflective, and are subject to the approval of the Bureau. The Bureau has agreed with the distribution companies a time-of-day tariff to be made available to all large users connecting directly to the transmission system. As in previous years, during 2010 the Bureau will review this tariff against out-turn costs for 2009 and against projected BST and TUoS charges for 2010, to confirm the tariff continues to be cost-reflective.

Economic level of leakage

While it is impractical to eliminate all leakage on water distribution networks, the level of leakage should be expected to be relatively low where the water distribution network is of a high standard. In order to determine the “economic” level of leakage (ELL), it is necessary to balance the costs of water loss through leakage against the cost of leakage reduction efforts and investments. We therefore intend to develop a methodology, to calculate the ELL for AADC and ADDC. This can in turn be used in future years to set targets for reductions in leakage and will be completed once our Water Usage (1.5) project is finished.

Additional work streams

- Approval of 2009 BST Exceptional Charges and 2011 BST Leaflet
- Approval of 2011 TUoS Charges Statement
- Approval of ADWEC's 2010 Seven-Year Statement
- Cost benchmarking dataset review and annual report
- Monitoring Mechanism for Water Transmission Constraints
- Review of 2010 AIS and TA Reports
- ADWEC price control (PC4 Period)
- PC3 – Network companies CAPEX efficiency review
- Economic price of embedded renewable energy
- Development of DSM Financing Mechanism

Objectives

The primary objectives of the Bureau are established in Law No (2) of 1998. They are:-

- To ensure, so far as it is practicable for it to do so, the continued availability of potable water for human consumption and electricity for use in hospitals and centres for the disabled, aged and sick.

Overall objectives are:-

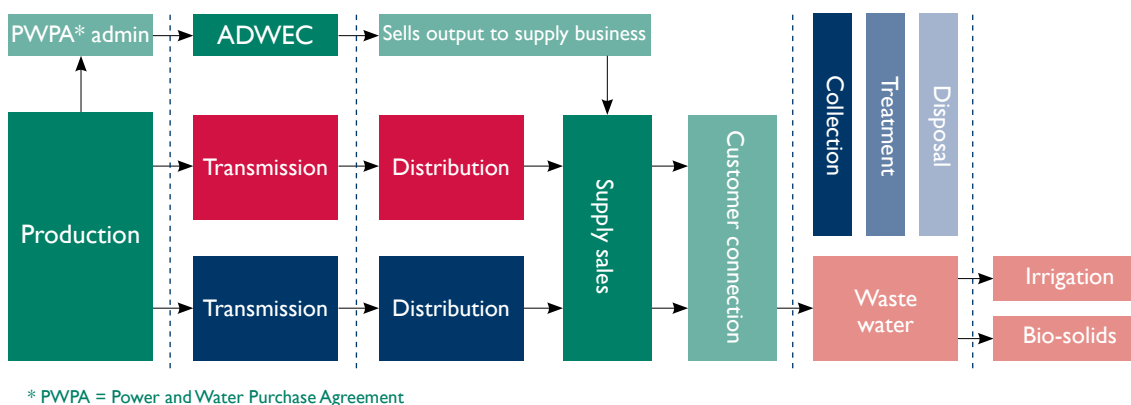
- To apply sound economic and technical regulation and supervision to all licence holders throughout the Emirate of Abu Dhabi's water, wastewater and electricity sector.
- Ensuring full licensee compliance with all licence conditions, regulations, codes and other documents in force.
- Establishing sound documented management procedures for all Bureau functions.
- Ensuring the welfare and development of all Bureau staff in order to enable them to meet the objectives given in this work plan.
- Representing the interests of all stakeholders in the water, wastewater and electricity sector; especially customers.

The above recognise the issue of Law No (2) of 1998 and its amendments in Law No (19) of 2007 and Law No (9) of 2009, concerning the Regulation of the Water and Electricity Sector in the Emirate of Abu Dhabi.

In addition, the Wastewater Sector is subject to Law No (17) of 2005 concerning the establishment of the Abu Dhabi Sewerage Services Company, as amended by Law No (18) of 2007, Law No (12) of 2008 and Law No (12) of 2009; and Law No (2) of 1998 as amended.

Sector structure

The structure is illustrated in terms of its supply chain components and Regulated Activities and all companies undertaking the activities shown are in possession of a licence issued by the Bureau.



Production of power and water is mainly in private hands and connects directly to the strategic transmission company (TRANSCO) to enable the efficient movement of bulk supplies of water and electricity to major demand and load centres throughout the Emirate. All water and power output is purchased by a single buyer, the Abu Dhabi Water and Electricity Company (ADWEC).

The distribution and supply (sale) of water and electricity to customers is undertaken by distribution companies who are in possession of a distribution and supply licence. Currently, there are two distribution companies in the sector: Al Ain Distribution Company (AADC) which covers the old municipality region of Al Ain and Abu Dhabi Distribution Company (ADDC) which covers the old municipality region of Abu Dhabi including Al Gharbia (the Western Region).

The wastewater collection network and treatment plants are predominantly owned and operated by the Abu Dhabi Sewerage Services Company (ADSSC), with disposal of treated sewage effluent (TSE) to irrigation companies.



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