

OECD

Financial Planning Tool for Water Utilities

User Manual

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Used abbreviations and acronyms

CIP	Capital Investment Programme
CPI	Consumer price index
EECCA	Eastern Europe, Caucasus and Central Asia (region)
EUR	Euro (the currency of the European Monetary Union)
EURIBOR	European Interbank Offered Rate
FPTWU	Financial Planning Tool in Water Utilities
Input-TI	Input data - time independent
Input-TD	Input data - time dependant
Lcd	litres/capita/day
LCU	Local Currency Unit
LIBOR	London Interbank Offered Rate
MIBOR	Moscow Interbank Offered Rate
NPV	Net Present Value
P&L	Profit and Loss (accounts)
PPI	Producer price index
VAT	Value-added tax
WS/WW	Water supply / Wastewater
W&WW Demand	Water and Wastewater services demand
W1-W10	Investment projects - water supply
WW1-WW6	Investment projects - wastewater

1 Introduction

1.1 Purpose of the FPTWU Tool

The overall idea and objective behind the development of the Financial Planning Tool in Water Utilities (FPTWU) Tool is to assist the water utilities in the EECCA region in achieving medium to long-term operational and financial sustainability. Such objectives, can however, only be realised when water utilities are equipped with instruments for financial modelling, planning, and analysis. Thus, the FPTWU Tool has been developed as just such an instrument and serves as a Tool for water utilities when initiating financial planning in their companies.

More specific objectives of the FPTWU Tool are:

- to assist the Water Utility in improving their financial status and in introducing medium term financial planning into everyday operating practice;
- to improve the investment decision making process through the incorporation of potential investment projects into the general framework of the financial planning process;
- to improve operational performance of the Water Utility through better monitoring of relevant performance indicators e.g. water demand, operating costs, collection rates, etc.;
- to assist the establishment of efficient communication between water utilities and municipalities by ensuring that communication is based on factual and well-justified information, data, and analysis through the use of the Tool's outputs.

1.2 Target group

The primary target group for use of the FPTWU Tool is the financial planning department or financial planning specialists in water utilities within the EECCA region.

The Tool and its functions/properties can also be utilised by the economic, financial departments of municipalities. In particular, it can be used for revision and approval of water and wastewater tariffs as well as for of allocating mu-

municipal budget funds to water utilities. In such cases, however, the municipal department's role will be that of a "user" of the Tool. In other words, while Water Utility specialists will develop the Tool's output, through filling-in of the necessary input data, municipal specialists will utilise the Tool's output in order to provide a qualitative basis for their decision making.

1.3 Acknowledgments and disclaimer

The functionality of the first version of the FPTWU Tool has been tested using data from the Bishkek Water Utility.

1.4 Structure of the Manual

The User's Manual is structured as follows:

- **Chapter 1 - Introduction** presents the background and objectives for the development of the FPTWU Tool.
- **Chapter 2 - Water sector issues in EECCA countries and the FPTWU Tool**, briefly outlines the water sector issues hindering the development of the sector and the scope of the Tool in response to these issues.
- **Chapter 3 - Tool Installation and setup** presents the hardware and software requirements for the Tool to operate properly, and the installation instructions as well as the start-up procedures.
- **Chapter 4 - Guide to spreadsheets** provides a guide to the various spreadsheets contained in the workbook. The guide describes the purpose of the spreadsheet, its structure, explain whether the spreadsheet requires data input or whether it is a spreadsheet with only calculations, the main variables presented in the spreadsheet, their purpose and unit measures; and the purpose or functionalities of buttons located in the spreadsheets.
- **Chapter 5 - Data input requirements** provide an overview of the data input required for the spreadsheets "Input-TI" and "Input-TD". Most of the numerical data needed to perform the Tools calculations has to be entered here.
- **Chapter 6 - Tariff calculation module** describes in detail how the user can calculate water and wastewater tariffs for all consumer groups serviced by the Water Utility. The tariff calculation in this spreadsheet is not static (based on a predefined formula), but rather a dynamic process providing a range of user-defined scenarios. In developing the "Tariff Calculation" spreadsheets, specific methodological aspects and concepts of tariff settings in EECCA countries has been utilised.
- **Chapter 7 - Capital expenditure programme** allows the user to analyse different aspects related to the implementation of investment projects in the Water Utility. It consists of four separate spreadsheets and provides the

user a number of functionalities which allows the user to analyse various investment projects.

- **Chapter 8 - Taxation** allows the user to calculate taxes and charges payable by the Water Utility. The module calculates taxes on the basis of the specific taxation requirements in the country where Water Utility is located. Such specifics are defined by the user.
- **Chapter 9 - Financial statements** summarises in an overview form the financial forecast of the Water Utility by providing the following statements: Profit and Loss account, Balance spreadsheet, and Cash Flow statement.
- **Chapter 10 - Charts** allows the user to see the effects in a graphic form the resulting consequence following various interventions analysed. Four charts are presented in the model with the purpose of visualising the most important financial and operational variables.

2 Water sector issues in EECCA countries and the FPTWU Tool

2.1 Water and sanitation sector issues in EECCA

Municipal owners of municipal infrastructure and water utility operators are striving at providing appropriate solutions to their customers within their service areas. The sector is still progressing towards a modernised water sector but the development is hindered by a large number of factors. One of the main obstacles is the lack of funding sources. However, there are also a number of other issues which needs to be addressed for the sector to develop. These issues are summarised below. These are, however, general findings and may not relevant for all EECCA countries and may already have been addressed.

- Most municipalities and Water Utilities in EECCA countries do very little strategic planning within the water sector;
- Very few Water Utilities have developed corporate development or strategic business plans;
- The owners of communal service infrastructure, municipalities are usually responsible for rehabilitation, modernisation, and development of the infrastructure;
- The owner has to approve any investment decisions made by the Water Utility – even if the Water Utility has the financing available;
- Municipal investment planning for infrastructure is often discretionary and there are often no clear and transparent criteria for appraising and prioritising investment projects;
- Municipal and Water Utility planners have little experience with multi-year investment planning; and
- Lack of adequate regulation and tariff setting rules and procedures – implies that tariff setting often becomes a highly politicised process (due to affordability/social concerns).

The development of the FPTWU Tool is a response to some of these issues.

2.2 Scope of the FPTWU Tool

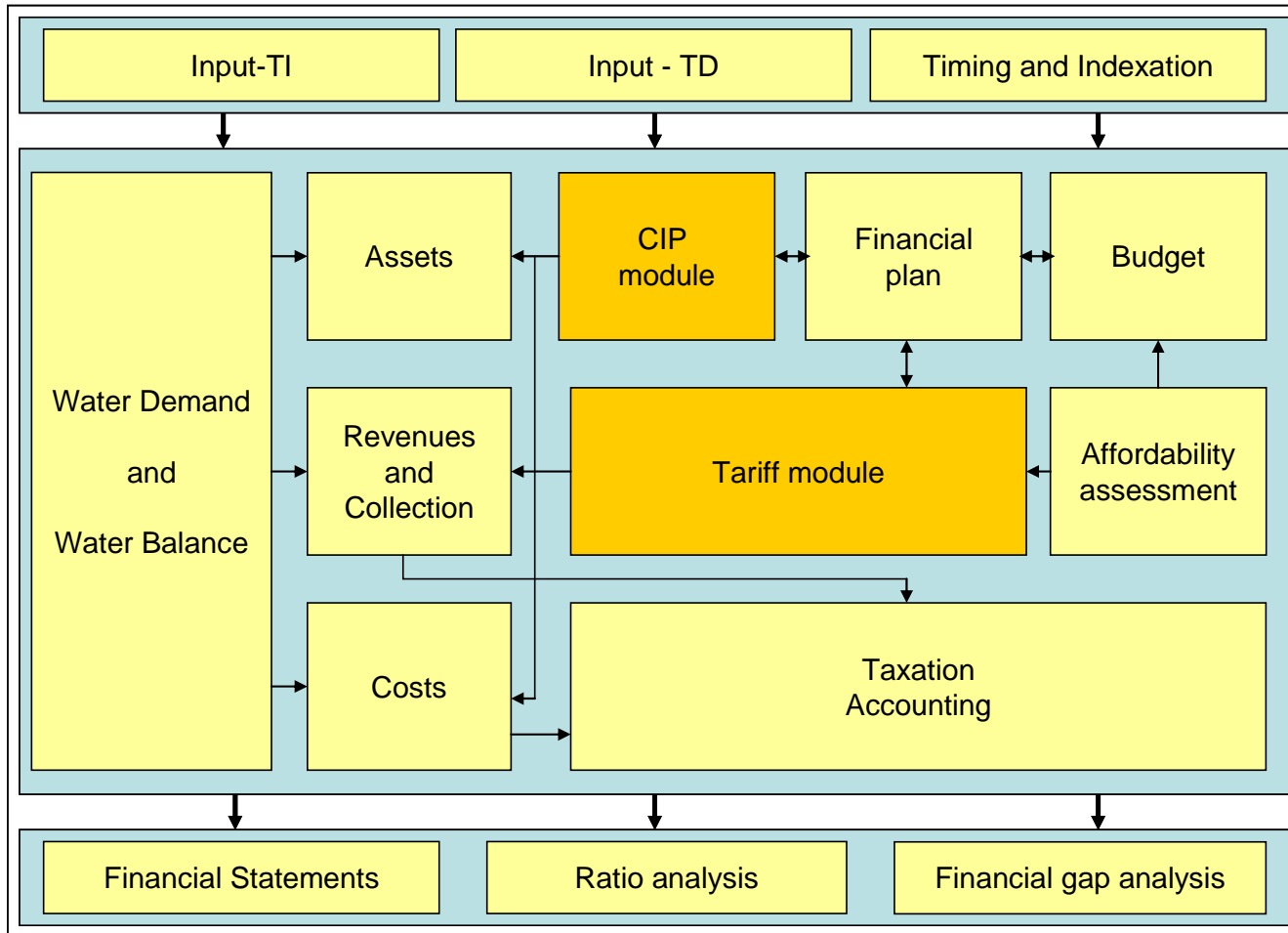
The overall purpose of developing the FPTWU Tool is to assist the water utilities in the EECCA region in reaching medium to long-term operational and financial sustainability. The development and implementation of the FPTWU Tool is expected to assist the water utilities in the EECCA countries to achieve the following specific goals:

- Improve the financial status of the water utilities;
- Assist in developing the practice of continuous medium term financial planning;
- Improve the basis for an informed investment decision making process;
- Achieve noticeable improvement in operational performance;
- Create a sound information background for effective communication between water utilities and municipalities through the use of the Tool's outputs, such as:
 - medium-term capital expenditure and maintenance and repair programmes;
 - tariff setting options over a short- to medium-term period, as well as options related to the decision-making process on allocation of municipal subsidies; and
 - financial plans for the funds needed from the municipality and/or other sources in order to finance the capital expenditure programme.

2.3 Structure of the FPTWU Tool

Figure 1 represents the FPTWU model structure. It shows the inter-linkages between different modules and worksheets and establishes a relative hierarchy of the model in the form of Input-Calculation-Output. In the following paragraphs, a brief description of the functionalities of each of the worksheets is provided.

Figure 1 Structure of the FPTWU Tool (financial model)



Input – TI: This spreadsheet is the input spreadsheet for all time independent assumptions. Cell C5 in this spreadsheet determines the selection of whether nominal or real variables are the basis for model calculations.

Input – TD: Inputs in this spreadsheet are time dependent in nature and are allocated to specific time periods within the various stages of the Water Utility life/production cycle.

Timing Flags: The Timing Flags spreadsheet utilises the model timing assumptions from the Input – TI spreadsheet. Specific timing flags (1 and 0) are set out for the periods.

Indexation: The Indexation spreadsheet calculates the indexation factor for each period.

Water Demand: Sets out the water consumption by different customer categories, the basis of which defines the water and wastewater demand for each period. The results of this spreadsheet calculation serve as the main input to the Water Balance calculation, but also for calculating the revenues of the Water Utility.

Water Balance: On the basis of the input from the Water Demand spreadsheet the Water Balance spreadsheet calculates the annual water balance; i.e. does the demand balance the supply of water.

Fixed Assets: This spreadsheet calculates the Fixed Asset and Depreciation totals for the whole period of the model.

Costs - water supply: This spreadsheet calculates the operational costs of the Water Utility related to water supply. The costs are calculated for each period on a cash receipts and Profit and Loss (P&L) basis. The main costs considered include operating costs (fixed and variable), maintenance costs, and energy consumption costs.

Costs - wastewater: This spreadsheet calculates the operational costs of the Water Utility related to wastewater. The costs are calculated for each period on a cash receipts and Profit and Loss (P&L) basis. The main costs considered include operating costs (fixed and variable), maintenance costs, and energy consumption costs.

Tariff calculations: Provide for the possibility to calculate tariffs and to make decisions concerning inclusion of different cost components into the tariff formula.

Revenues: This spreadsheet calculates the revenues from all customer groups. Revenue is calculated on a cash receipts and a P&L basis. A separate calculation for VAT is projected.

Collection: Provides analysis for the collection of the billed water tariffs by each customer group. The spreadsheet provides for the possibility to analyse

the debt from each customer group as well as it defines debt-write-off schedules.

VAT, Tax item selection, Taxation: Calculates the amount of Fees and Taxes payable on the financial results of the company as projected. The spreadsheet determines in what period and what proportion of the tax is payable taking into consideration losses carried forward.

Financing: Calculates the parameters related to borrowings of water utility, namely principal and interest repayments.

Financial Statements: In this worksheet the financial accounts of water utility are developed and represented by detailed profit and loss statement, cash flow statement, and balance sheet.

CIP module: The capital expenditure programme module allows for decisions to be made on individual investment projects. It also calculates the rate of return on each project, identifies the sets of mandatory and regular investments, provides the basis for analysis of the financing of the CIP programme and calculates the fixed asset additions and respective depreciation charges related to new investments.

Affordability: This worksheet calculates average household bill for water and wastewater services as percentage of average household income.

Summary and performance indicators, charts: This worksheets summarise key technical, financial, operational parameters of water company as well as calculate set of performance indicators for utility monitoring. The Charts are graphical presentation of the most important operational and financial indicators of water utility are shown.

Financing gap: In this worksheets analysis of the financial gap is calculated on the basis of cash in and cash out. The resulting gap is presented also graphically and possibility exists to close the financing gap via set of measures. .

3 Tool installation and setup

3.1 Hardware and software requirements

3.1.1 Hardware Requirements

In order to run the FPTWU Tool, the following minimum hardware equipment characteristics are recommended:

- Pentium processor, 200Mhz;
- 128 Mb RAM;
- 10–20 Mb hard-disk space (depending on input data amount);
- Screen resolution 1024x768;
- Microsoft compatible pointing device (mouse).

The FPTWU Tool will also run using hardware with lesser characteristics than specified above, however, in such cases spreadsheet updates and consequent calculations will be carried out at a slower rate and will impede the efficiency of the Tool.

3.1.2 Software Requirements

The Model is programmed in Microsoft Excel 2002. The user needs to have this software installed as well as Analysis ToolPack enabled. The overall software requirements are:

- Operating system Microsoft Windows 95/98/ME/2000/XP;
- Excel 97/2000 and above;
- English and Russian fonts for Windows.

3.2 FPTWU Tool installation

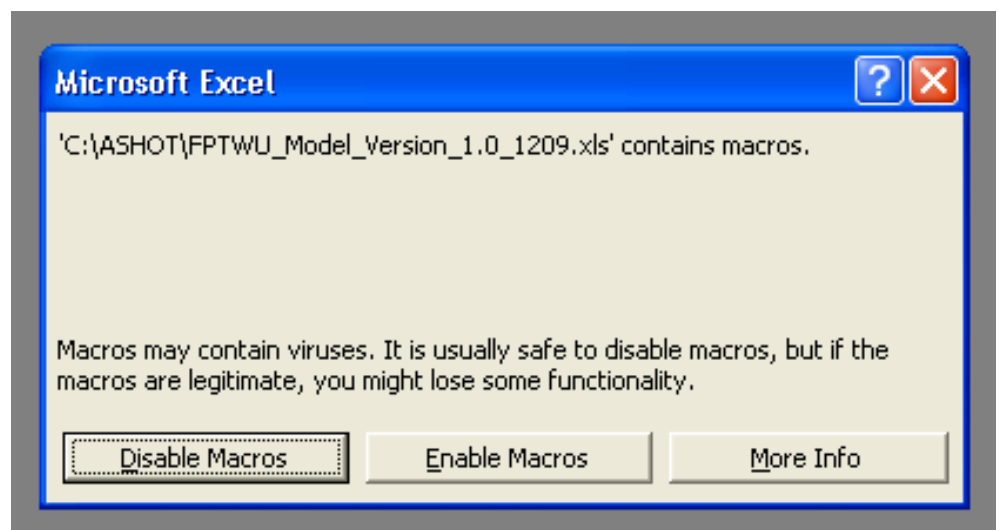
Since the Tool has been developed using Microsoft Excel environment, no specific installation procedure is required. However, it is suggested that the following steps are carried out:

1. Create a directory on your PC's hard disc and name it "FPTWU Tool";
2. In the directory "FPTWU Tool" create sub-directory "Model";
3. Copy the file " FPTWU_Model_Version_1.4.xls" into sub-directory "Model";
4. In the directory "FPTWU Tool" create sub-directory "Data";
5. Use sub-directory "Data" to store all the input data files.

3.3 FPTWU Tool start-up

To start up the FPTWU Tool you will follow these steps:

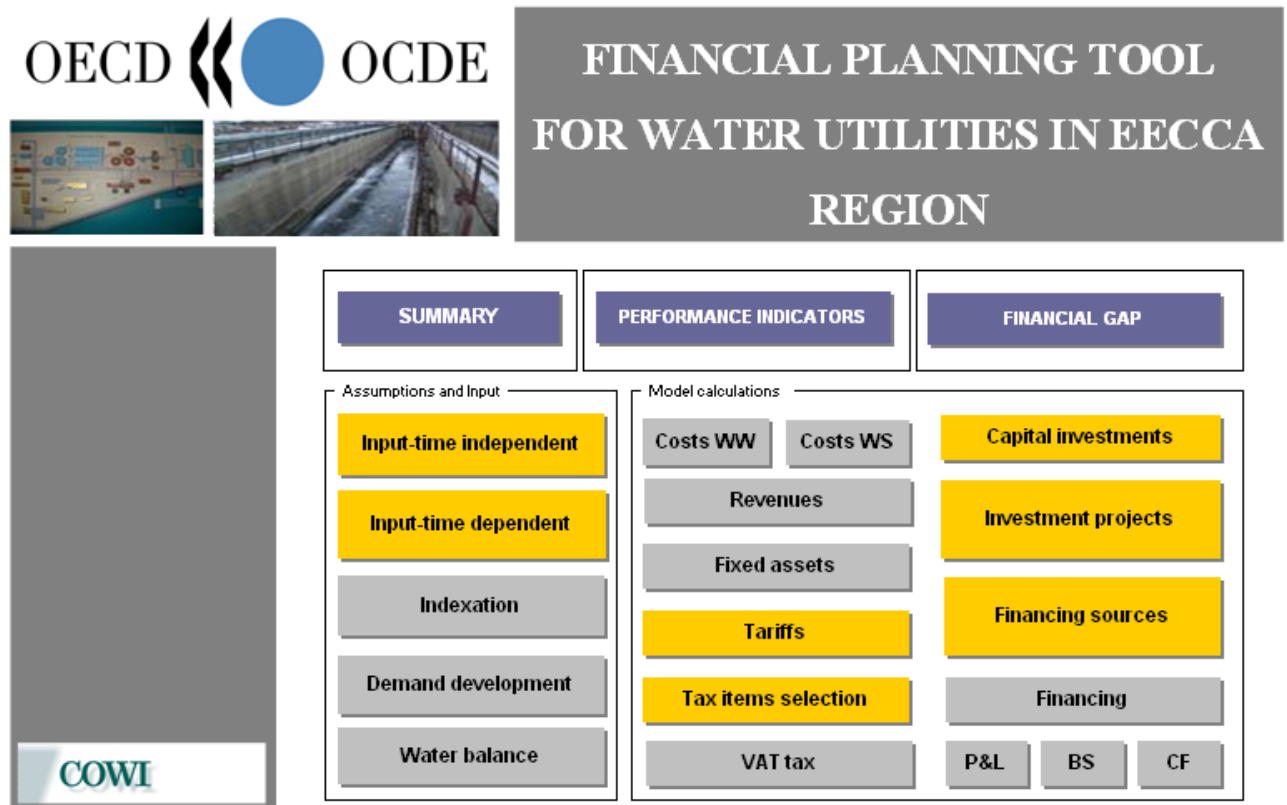
1. Start your Microsoft Excel programme;
2. Make sure that the "Analysis ToolPack" and "Analysis ToolPack-VBA" options are selected and if not select them (on the menu bar click "Tools", then "Add-ins" to see these options);
3. Go to directory "Model" and double-click the file "FPTWU_Model_Version_1.4.xls"
4. Depending on the setting at your computer, you might receive the following pop-up message:




It asks you whether you want to run macros in this file. Push the button "Enable Macros", since you will need them in order to work with the FPTWU Tool.

5. FPTWU Tool then will run and open the navigation screen as shown below:

Figure 2 FPTWU Tool menu, worksheet "Front Page"



6. Use the navigation screen and by pushing the respective buttons you will be directed to that particular worksheet/section of the FPTWU Tool.
7. Work with the worksheets as it is specified in the sections dedicated to each of the worksheet further below in this manual.
8. You can always get back to the navigation menu screen by pushing the button  which you will find on every worksheet of the Tool.
9. After you have made modifications in the tool, do not forget to save your work. Select from the Excel menu function "Save as..." and save your the file with the same name, but with a variant name and number, for example ""FPTWU_Model_Version_1.0_Bishkek_1.xls". The red text is the addition you need to make to standard file name. Thereafter just change the number "1" to save all future work with new variant numbers.

3.4 Specific Tool Features

Once the user has an understanding of the structure of the FPTWU Tool, the navigation between the various sheets of the model is not difficult. The main navigation sheet is called "Front Page" (Figure 2). Buttons are placed on each sheet to facilitate easy return to this page. In general, a "Back" button is located on each sheet. Activating this button will take the user directly to the main navigation sheet.

While working procedures are reasonably straightforward, the user should be aware of some specific features of the Tool.

!! ATTENTION!! Data input:

!! Data can be entered only into cells labelled with yellow colour. Do not enter data in any other model cells as it will introduce calculation error.

Entering data. Data shall only be entered in cells highlighted with yellow colour. At no circumstance data can be entered in other cells. This will damage logic of formula calculations and lead to wrong results.

Nominal price analysis. The Tool is pre-programmed to make a nominal price analysis. However, it is possible to switch between nominal and real calculations by using cell C5 in the sheet "Input-TI".

Original file. Note that the original file is coming with a set of data inputs. Any changes that are made to the data in the model and subsequently saved will result in the loss of the original file results. Therefore, it is advisable, after loading the FPTWU Tool to a computer, to save it again under a different name—thereby maintaining the original file's calculation results.

3.5 How to get started

1. Start your Microsoft Excel programme;
2. Go to directory "Model" and double-click the file "FPTWU_Model_Version_1.4.xls"
3. Use "Front Page" menu to get to "Input-TI" worksheet;
4. Using guidance and information in this manual input all the required data and assumptions in that worksheet;
5. Using the button "Back" in "Input-TI" worksheet get back to the menu page;
6. Use "Front Page" menu to get to "Input-TD" worksheet;
7. Using guidance and information in this manual input all the required data and assumptions in that worksheet;

8. Using the button "Back" in "Input-TD" worksheet get back to the menu page;
9. Use "Front Page" menu to get to "Tariff Calculation" worksheet;
10. Using guidance and information in this manual select whether you want to enter your own tariff level or you want the model to calculate it for you. If you want the model to calculate it for you select which cost components you area allowed to include in tariff base ;
11. Using the button "Back" in "Tariff Calculation" worksheet get back to the menu page;
12. Use "Front Page" menu to get to "Tax items selection" worksheet;
13. Using guidance and information in this manual select which fees and taxes you will have to pay, the base for calculation of fees and taxes, and rate of fees and taxes ;
14. Using the button "Back" in "Tax items selection" worksheet get back to the menu page;
15. Use "Front Page" menu to get to capital expenditure module (4 worksheets highlighted red);
16. Using guidance and information in this manual input all the required data and assumptions in these worksheet by this defining which investments you want to undertake and what sources of financing you want to use for that ;
17. Using the button "Back" get back to the menu page;
18. Use "Front Page" menu to get to "Financing Gap" worksheet and review the financial surplus or deficit of your company;
19. Use the button " Show the Graph of Gap" to see the results graphically.
20. Use buttons in "Financial Gap" graphical presentation worksheet to revise tariffs and investments in order to adjust financial surplus or gap, if necessary.
21. Use "Front Page" menu to get to "Summary and key ratios" worksheet and review the main financial and operational indicators of your company;
22. Use the buttons " See Graph" to see the results graphically.

4 Guide to Spreadsheets

The purpose of this section of the User Manual is to provide a guide to all spreadsheets contained in the FPTWU Tool. This guide will provide the user with a handy and quick method to complete each spreadsheet. The guide will describe:

- the purpose of the spreadsheet;
- its structure;
- explain whether the spreadsheet requires data input or whether it is a spreadsheet with only calculations;
- the main variables presented in the spreadsheet, their purpose and unit measures; and
- the purpose or functionalities of buttons located in the spreadsheets.

The order in which the spreadsheets are presented follows the order in which they appear in the FPTWU Tool workbook.


All spreadsheets are described without exception. Some of the spreadsheets, however, are described in greater detail somewhere else in this Manual under specifically dedicated parts or items. In such cases, a brief description of the spreadsheets purpose is provided and reference is made to a specific section in the Manual with supplementary details on functionality, structure, and variables. All other spreadsheets are described in this section following the structure presented above.

4.1 Summary and key ratios

The purpose of the spreadsheet "Summary and key ratios" is to present an overview of the most important figures from the FPTWU Tool. It consists of five sections:

- Key operating figures - summarising on an annual basic key operating parameters of the Water Utility, such as number of connections, coverage rate, water production, water losses, etc;

- Summary of financial statements - presenting the main figures from financial accounts;
- Key financial ratios - calculating major financial ratios indicating the financial situation of the Water Utility;
- Tariffs - presenting development over time of water and wastewater tariffs; and
- Investments - presenting investments into water and wastewater related assets on an annual basis.

For each of the above sections in the spreadsheet, with the exception of the Investments Section, key figures are also presented in a graphical form. In order to see the graphics of selected variable's development over time, the user must click once on the button  in the respective section of the summary spreadsheet. The following variables are presented in graphical form:

- Total sales;
- Total operating costs;
- Net cash inflow/outflow;
- Household water tariff development;
- Household wastewater tariff development;
- Connection rates of households to water and wastewater systems separately for multi-storey building households and the private housing sector;
- Operating margin; and
- Profit margin.

All the values in this spreadsheet are automatically calculated and do not require input from the user.

Figure 3 shows part of the spreadsheet with the summary of Key Operating Figures.

Figure 3 Extract from the "Summary and key ratios" spreadsheet showing summary of the Key Operating Figures

KEY OPERATING FIGURES	SEE GRAPH					
Population in service area						
multi-storey buildings	number	343,740	343,740	343,740	343,740	343,740
private housing sector	number	429,171	429,171	429,171	429,171	429,171
Number of people connected to water supply						
multi-storey buildings	number	250,000	253,117	258,180	263,343	268,610
private housing sector	number	282,630	284,394	287,238	290,111	293,012
Number of subscribers connected to water supply						
multi-storey buildings	number	83,333	84,372	86,060	87,781	89,537
private housing sector	number	94,210	94,798	95,746	96,704	97,671
Number of people connected to wastewater system						
multi-storey buildings	number	205,398	206,680	208,747	210,834	212,943
private housing sector	number	240,000	240,750	241,953	243,163	244,379
Number of subscribers connected to wastewater system						
multi-storey buildings	number	68,466	68,893	69,582	70,278	70,981
private housing sector	number	80,000	80,250	80,651	81,054	81,460
Connection rate - water supply						
multi-storey buildings, water	%	73%	74%	75%	77%	78%
private housing sector, water	%	66%	66%	67%	68%	68%
Connection rate - wastewater						
multi-storey buildings, wastewater	%	60%	60%	61%	61%	62%
private housing sector, wastewater	%	56%	56%	56%	57%	57%
Metered households						
multi-storey buildings	number	38,274	38,274	38,274	38,274	40,524
private housing sector	number	17,006	17,006	17,006	17,006	17,756
multi-storey buildings	%	45.9%	45.4%	44.5%	43.6%	45.3%
private housing sector	%	18.1%	17.9%	17.8%	17.6%	18.2%
Number of personnel	number	2,152	2,152	2,152	2,152	2,152
Total water production	000' m3	181,188	182,458	177,406	168,615	160,440
Total water losses	000' m3	135,969	136,821	131,429	122,468	114,118

4.2 Performance indicators

The purpose of the spreadsheet "Performance indicators" is to provide for the possibility of monitoring activities of water utility over time. Performance indicators typically include set of variables indicating financial healthiness of water company, technical conditions of water and sanitation infrastructure, and levels of services provided to customers.

Large number of potentially usable performance indicators exists. One problem could be in over-using them. Water utilities that have too many such indicators will find themselves trying to achieve set of objectives, which are difficult to be reached together or even set of conflicting objectives. Therefore, careful selection of performance indicators is important for such tool to prove useful in monitoring activities of the company.

Current Tool uses selected number of such performance indicators, namely:

Financial indicators

- Working ratio
- Revenue collection from households (absolute)
- Revenue collection per capita for registered subscriber - households
- Revenue collection from other customers (absolute)
- Revenue collection from budget organisations (absolute)
- Collection ratio dynamics - population
- Full cost-recover for share of households - water
- Full cost-recover for share of households - wastewater
- Collection ratio - population

- Collection ratio - other customers
- Collection ratio - budget organisations
- Operating margin
- Profit margin
- Current ratio
- Ratio of account receivable to total sales
- Ratio of account payable to total sales
- Debt to asset
- Debt to equity

Technical and operating indicators

- Share of registered subscribers with water meters
- multi-storey buildings
- private housing sector
- Average water consumption per capita for subscribers with water meters
- Ratio of metered water billed to total water billed - households
- Ratio of metered water billed to total water billed - other customers
- Ratio of metered water billed to total water billed - budget organisations
- Average daily production of water per registered inhabitant
- Personnel per 1000 subscribers
- Personnel per 1000m³ produced
- Connection rate, multi-storey buildings, water
- Connection rate, private sector, water
- Connection rate, multi-storey buildings, wastewater
- Connection rate, private sector, wastewater

Figure below provides snapshot of the "Performance indicators" spreadsheet.

PERFORMANCE INDICATORS		2005	2006
FINANCIAL INDICATORS			
Working ratio	ratio	0.24	0.41
Operating margin	%	38%	30%
Profit margin	%	-8%	-8%
Current ratio	ratio	4.9	7.2
Revenue collection from households (absolute)	000' LCU	5,613,196	4,627,005
Revenue collection per capita for registered subscriber - households	LCU	10,539	8,608
Revenue collection from other customers (absolute)	000' LCU	854,984	744,874
Revenue collection from budget organisations (absolute)	000' LCU	3,747	1,249
Full cost-recover for share of households - water	%	100%	100%
Full cost-recover for share of households - wastewater	%	100%	100%
Collection ratio - population	ratio	100%	100%
Collection ratio - other customers	ratio	100%	100%
Collection ratio - budget organisations	ratio	100%	100%
Ratio of account receivable to total sales	ratio	0.03	0.00
Ratio of account payable to total sales	ratio	0.00	0.00
Debt to asset	%	2%	5%
Debt to equity	%	2%	5%

4.3 Financial gap

The purpose of the spreadsheet "Financial Gap" is to calculate the net financial gap or net financial surplus of the Water Utility. It is calculated as a difference between the Sources of Cash and the Uses of Cash.

To calculate the total value for Sources of Cash, variables, calculated somewhere else within the model, are summed-up using:

- Receipts from residential sector;
- Receipts from non-residential sector;
- Receipts of budgetary subsidies;
- Loan disbursements;
- Grant allocations.

To calculate the total value for Uses of Cash, variables, calculated somewhere else within the model, are summed-up using:

- Operating costs;
- Investment costs;
- Tax payments and fees;
- Loan repayments.

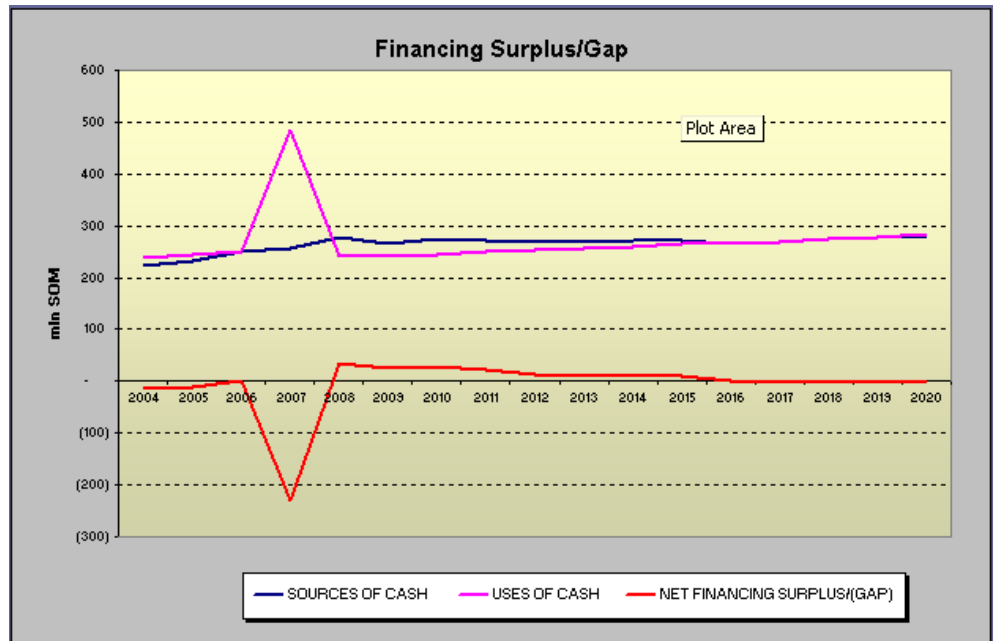
The Net Financial Surplus or Gap is then calculated as the absolute difference between these two values. The calculation is conducted on an annual basis and, thereafter, aggregated into annual values. Figure 4 presents a snapshot of the Financial Gap spreadsheet.

Figure 4 Calculation of the Financial Gap

FINANCIAL PLANNING TOOL																						
Back																						
FINANCIAL GAP		31-12-2004	31-12-2005	31-12-2006	31-12-2007	31-12-2008																
		Historical	Historical	Historical	Forecast	Forecast																
SOURCES OF CASH																						
Receipts from residential sector	000' LCU	300.318	351.642	491.870	390.959	331.851																
Receipts from non-residential sector	000' LCU	181.542	277.018	295.956	367.557	299.185																
Receipts of budgetary subsidies	000' LCU	-	-	-	-	-																
Loan disbursements	000' LCU	-	-	-	466	466																
Grant allocations	000' LCU	-	-	-	-	-																
Total	000' LCU	481.860	628.660	787.825	758.983	631.503																
USES OF CASH																						
Operating costs	000' LCU	573.900	474.280	638.892	673.133	710.620																
Investment costs	000' LCU	-	-	-	2.330	2.330																
Tax payments and fees	000' LCU	(91.520)	(53.320)	(77.045)	(66.347)	(70.113)																
Bad debt write-off	000' LCU	-	-	-	-	-																
Loan repayments	000' LCU	-	-	-	43.750	38.281																
Total	000' LCU	482.380	420.960	561.847	652.866	681.118																
NET FINANCING SURPLUS/(GAP)		(520)	207.700	225.978	106.117	(49.615)																
Show the Graph of Gap																						
		<table border="1"> <thead> <tr> <th>Gap evaluation</th> <th>2004</th> <th>2005</th> <th>2006</th> </tr> </thead> <tbody> <tr> <td>NET FINANCING SURPLUS/(GAP)</td> <td>(520)</td> <td>207.700</td> <td>225.978</td> </tr> <tr> <td>SOURCES OF CASH</td> <td>481.860</td> <td>628.660</td> <td>787.825</td> </tr> <tr> <td>USES OF CASH</td> <td>482.380</td> <td>420.960</td> <td>561.847</td> </tr> </tbody> </table>					Gap evaluation	2004	2005	2006	NET FINANCING SURPLUS/(GAP)	(520)	207.700	225.978	SOURCES OF CASH	481.860	628.660	787.825	USES OF CASH	482.380	420.960	561.847
Gap evaluation	2004	2005	2006																			
NET FINANCING SURPLUS/(GAP)	(520)	207.700	225.978																			
SOURCES OF CASH	481.860	628.660	787.825																			
USES OF CASH	482.380	420.960	561.847																			

Calculated surplus or gap values are also presented graphically for quick assessment. In order to see the graph, the user must click the button **Show the Graph of Gap** located at the bottom of the spreadsheet. Once activated the following graphical presentation of the surplus/gap will appear:

Figure 5 Financial Surplus/Gap graph



All the values in the "Financial Gap" spreadsheet are automatically calculated and do not require input from the user. The spreadsheet uses, as its input variable, values calculated somewhere else in the model and does not require any data input in "Input-TI" and "Input-TD" spreadsheets.

4.4 Data input module - Input-TI and Input-TD

The purpose of the spreadsheets "Input-TI" and "Input-TD" is to allow the user the ability to enter historical data as well as future assumptions which can then be used in model calculations.

A detailed review of these spreadsheets is provided in section 5.

4.5 Timing flags

The purpose of the spreadsheet "Timing flags" is to define time frameworks for the entire model and to determine (calculate) specific model period lengths, and assign them an appropriate name. This spreadsheet uses "1"s and "0"s to indicate, or "flag" the specific model period. Hence, the term "timing flags" is used.

The model is built up on an annual basis and this spreadsheet defines:

- each of the year for the entire model period;
- names of each year in the format Day-Month-Year, where Day is the last day of the last month of each year in the current year;
- historical years and forecasted (future years);

- total number of years in the model;

Figure 6 shows a snapshot of the "Timing flags" spreadsheet.

Figure 6 Timing Flags spreadsheet

FINANCIAL PLANNING TOOL					
Back					
TIMING FLAGS				31-12-2004 Historical	31-12-2005 Historical
End of first period	Date	31 dec 2004			
Model period length	Month	12			
Number of month per year	Months	12			
Number of days per year	Days	365			
Number of years				1	1
Days per period	Days		365		365
Historical data period length	Periods	3	1		1
MODEL TIMELINE					
Period number	year		1		2
Period marking	Text		Historical		Historical
Periods from start of the model	Number		0		1
Period end date	Date		31-12-2004		31-12-2005
NOTE: pink cell I21 refers to an INDICATIVE ZERO for iterative calculations of model periods USER DOES NOT INPUT ANY DATA ON THIS WORKSHEET					

All the values in the "Timing flags" spreadsheet are automatically calculated and do not require input from the user. The user will have to enter all necessary data in the "Input-TI" spreadsheet in order to generate a calculation of all timing flags in this spreadsheet.

4.6 Indexation

The purpose of the spreadsheet "Indexation" is to calculate values for different indices that are used throughout the model.

Five different indices are calculated in the spreadsheet. These are:

- Consumer price index (CPI);
- Producer price index (PPI);
- Wage index, calculated as CPI + estimated real wage increase;
- Energy index;
- Chemicals and other material price index calculated as CPI + estimated real price increase for chemicals and other material.

On Figure 7 a snapshot of Indexation spreadsheet is provided.

Figure 7 Indexation spreadsheet

FINANCIAL PLANNING TOOL		31-12-2004	31-12-2005	31-12-2006	31-12-2007	31-12-2008	31-12-2009
Back		Historical	Historical	Historical	Forecast	Forecast	Forecast
INDEXATION							
Indexation related calculations							
3	Period number	1	2	3	4	5	6
4	Length of period	1	1	1	1	1	1
11	Base date and periods from base date to first period	31-12-2004					
12	Period number from 01 January 2004	0	2	3	4	5	6
13	Years from 1 Jan 2004	0	2	3	4	5	6
15	Annual inflation rate - CPI	0,0%	0,0%	0,0%	5,0%	5,0%	5,0%
16	Annual inflation rate - PPI	0,0%	0,0%	0,0%	5,0%	5,0%	5,0%
17	Wages applicable inflation rate	0,0%	0,0%	0,0%	5,5%	5,5%	5,5%
18	Energy applicable inflation rate	0,0%	0,0%	0,0%	1,0%	1,0%	1,0%
19	Chemicals and other material applicable inflation rate	0,0%	0,0%	0,0%	5,8%	5,8%	5,8%
21	Number of Months in Period	12					
22	Number of Months in Year	12					
23	Number of days in year	365					
24	Number of periods in year	1					
26	Year number	0	2	3	4	5	6
27	Index review dates	01-01-2005			1,00	1,00	1,00
28	Cumulative Number of Index Reviews				1,00	2,00	3,00
Applicable Indexes							
31	CPI	1,0000	1,0000	1,0000	1,0500	1,1025	1,1576
32	PPI	1,0000	1,0000	1,0000	1,0500	1,1025	1,1576
33	Wage Index	1,0000	1,0000	1,0000	1,0550	1,1130	1,1742
34	Energy Index	1,0000	1,0000	1,0000	1,0100	1,0201	1,0303
35	Chemicals and other material index	1,0000	1,0000	1,0000	1,0575	1,1183	1,1828

To calculate the above mentioned indices, the user will have to enter data in the "Input-TD" spreadsheet, at historical and forecasted inflation levels, as well as estimated data on real price increases.

All indices are calculated at/on the base date, which in the current version of the model is set at 01 January 2004. This date, however, could be modified by the user, in which case all the indices are re-calculated to a new base date.

Table 1 Indices and cost items to which they are applied

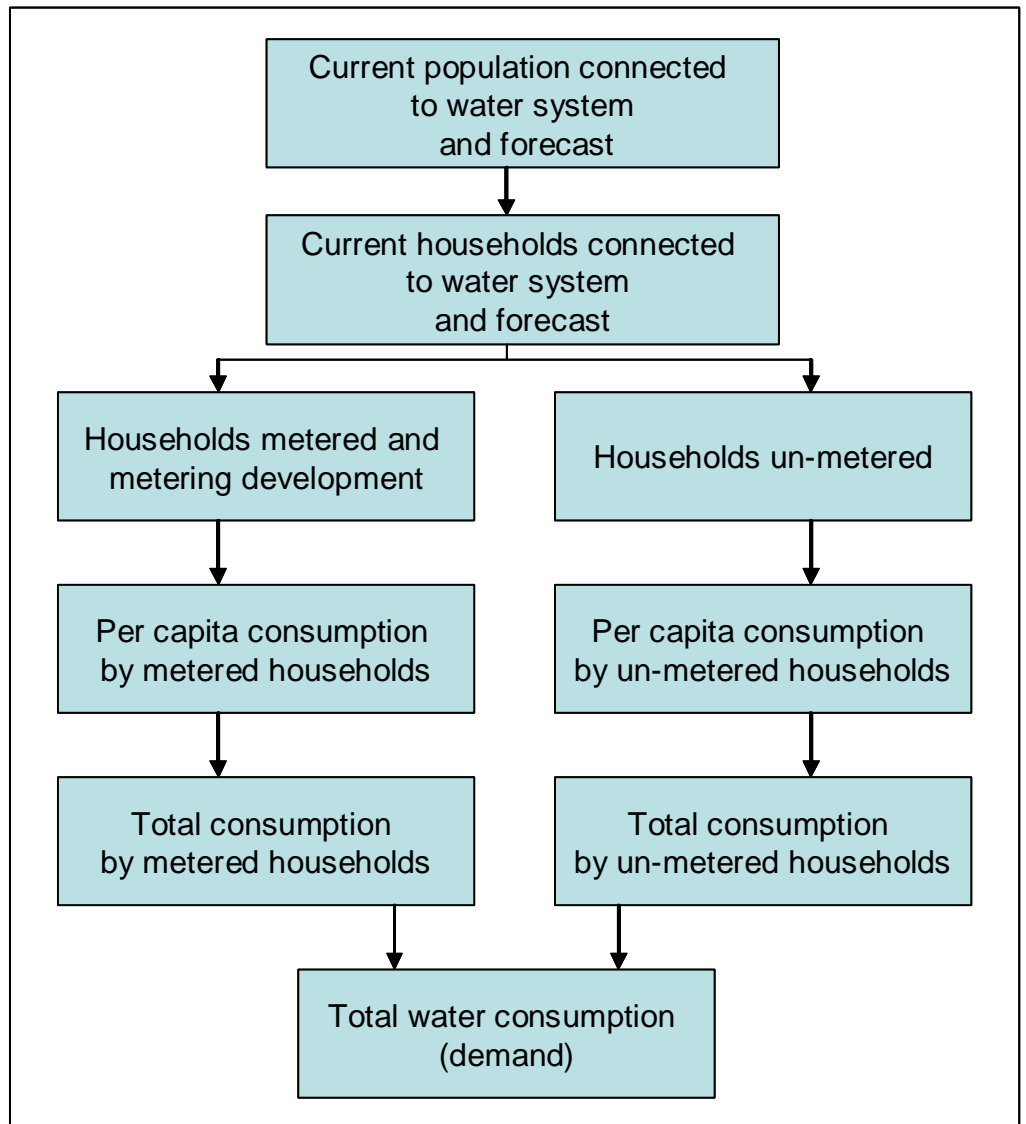
Index	Cost items to which the current index is applied
Consumer price index (CPI)	Fuel cost, Cost of purchased water, Other costs
Producer price index (PPI)	Cost of spare parts, material for maintenance cost
Wage index	Staff cost
Energy index	Electricity cost
Chemicals and other material price index	Chemicals and other material for water and wastewater treatment costs,

4.7 Water demand and wastewater discharges

The purpose of the spreadsheet "W&WW Demand" is to calculate the demand for water and total wastewater discharges. The values are calculated in total as well as for each customer group. All the cells in this spreadsheet are automatically generated calculations and do not require any data input. However, a substantial amount of data needs to be entered by the user in "Input-TI" and "Input-TD" spreadsheets in order to perform all calculations in this spreadsheet.

Figure 8 shows the logical sequence of formulas used to calculate water demand.

Figure 8 Logical sequence of water demand calculation



1. On the basis of existing data on the population connected to the water network, and any planned extension or future coverage, (current and forecasted population/households connected in multi-storey buildings and/or private housing sector) a calculation is made.
2. Using simplified average measures/figures on the number of persons per household, the total number of connected households is derived.
3. All households connected to water system are split into two categories - metered and un-metered, using data inserted/entered by the user in the "Input-TD" spreadsheet.

4. In the next step, per capita water consumption levels are assigned to individuals in metered and un-metered households, as water consumed per capita per day (lcd). For metered households, the user will enter per capita consumption data based on actual water meter reading in the "Input-TD" spreadsheet. For un-metered households the user will enter per capita consumption data based on norms in the "Input-TD" spreadsheet.
5. Finally, using the per capita consumption data, the number of people per household and the total number of households, the current and forecasted water consumption levels (demand) is calculated.

A similar procedure is used in order to calculate wastewater discharge levels. Figure 9 below shows a part of the "W&WW Demand" spreadsheet used to calculate water and wastewater demand levels according to the procedure described.

Figure 9 Snapshot of "W&WW Demand" spreadsheet with calculation of water and wastewater levels according to above described procedure

FINANCIAL PLANNING TOOL							
Back							
WATER CONSUMPTION AND WASTEWATER DISCHARGE			31-12-2005	31-12-2006	31-12-2007	31-12-2008	31-12-2009
			Historical	Historical	Forecast	Forecast	Forecast
MULTISTORY BUILDINGS							
Total population	Number		625.100	602.400	596.376	596.376	596.376
Connected to water supply system	Number		574.000	539.943	539.943	539.943	539.943
Connected to wastewater system	Number		540.476	504.600	504.600	504.600	504.600
Connection rate - water supply	%		92%	90%	91%	91%	91%
Connection rate - wastewater	%		86%	84%	85%	85%	85%
Water Demand - multi-storey buildings							
Connected households	Number		229.600	215.977	215.977	215.977	215.977
metered	Number		213.800	214.366	214.366	214.366	214.366
un-metered	Number		15.800	1.611	1.611	1.611	1.611
Connected population	Number		574.000	539.943	539.943	539.943	539.943
metered	Number		534.500	535.915	535.915	535.915	535.915
un-metered	Number		39.500	4.028	4.028	4.028	4.028
Water consumption	000 m3		32.291	32.451	32.422	32.422	32.422
metered	000 m3		31.931	32.108	32.080	32.080	32.080
un-metered	000 m3		361	343	343	343	343
Per capita water consumption	lcd		164	165	165	165	165
metered	lcd		164	164	164	164	164
un-metered	lcd		25	233	233	233	233
Wastewater Discharge - multi-storey buildings							
Connected households	Number		216.190	201.840	201.840	201.840	201.840
metered water households	Number		213.800	199.000	199.000	199.000	199.000
un-metered water households	Number		2.390	2.840	2.840	2.840	2.840
Connected population	Number		540.476	504.600	504.600	504.600	504.600
metered water households	Number		534.500	497.500	497.500	497.500	497.500
un-metered water households	Number		5.976	7.100	7.100	7.100	7.100
Wastewater discharge	000 m3		31.985	30.411	30.384	30.384	30.384
metered water households	000 m3		31.931	29.806	29.780	29.780	29.780
un-metered water households	000 m3		55	605	604	604	604
Per capita wastewater discharge	lcd		162	165	165	165	165

In the same spreadsheet, the water demand and wastewater discharge levels are calculated for non-household customer groups. The following groups are considered:

- Industry;
- Budget organisations;

- Commercial entities; and
- District heating providers.

Calculations for non-household groups are based on the data entered by the user in the "Input-TD" spreadsheet regarding the actual current volumes of water consumption, wastewater discharges, as well as the estimated percentage change (increase/decrease) in such consumption over time. The split between non-household customers into metered and un-metered is also provided. Figure 10 shows a part of the "W&WW Demand" spreadsheet used to calculate water and wastewater demand levels for non-household group of customers.

Figure 10 Snapshot of "W&WW Demand" spreadsheet with calculation of water and wastewater levels for non-household groups of customers

FINANCIAL PLANNING TOOL						
Back						
WATER CONSUMPTION AND WASTEWATER DISCHARGE			31-12-2005	31-12-2006	31-12-2007	31-12-2008
			Historical	Historical	Forecast	Forecast
NON-HOUSEHOLD WATER DEMAND						
Industrial water consumption	000 m3					
metered	000 m3		6.291	6.291	6.291	6.291
un-metered	000 m3		-	-	-	-
Budgetary organisations	000 m3					
metered	000 m3		2.647	2.647	2.647	2.647
un-metered	000 m3		-	-	-	-
Commercial units	000 m3					
metered	000 m3		-	-	-	-
un-metered	000 m3		-	-	-	-
Water for district heating	000 m3					
metered	000 m3		6.908	6.908	6.908	6.908
un-metered	000 m3		-	-	-	-
NON-HOUSEHOLD WASTEWATER DISCHARGE						
Industrial wastewater discharge	000 m3					
metered	000 m3		6.291	6.291	6.291	6.291
un-metered	000 m3		-	-	-	-
Budgetary organisations	000 m3					
metered	000 m3		2.647	2.647	2.647	2.647
un-metered	000 m3		-	-	-	-
Commercial units	000 m3					
metered	000 m3		-	-	-	-
un-metered	000 m3		-	-	-	-
Water from district heating	000 m3					
metered	000 m3		6.908	6.908	6.908	6.908
un-metered	000 m3		-	-	-	-
TOTAL WATER DEMAND						
Household water demand	000 m3		36.581	37.173	37.135	37.135
metered			34.447	35.147	35.113	35.113
un-metered			2.133	2.026	2.022	2.022
Industrial water consumption	000 m3		6.291	6.291	6.291	6.291
metered			6.291	6.291	6.291	6.291

After calculating the individual water consumption levels and wastewater discharge levels for each customer group, the total current water consumption levels and future water demand levels are calculated. Similarly, total current wastewater discharge levels and future wastewater discharge levels are calculated. The total figures are also split into metered and un-metered fractions. The total figures are then used as input in the other spreadsheets in the model.

4.8 Water balance

The purpose of the "Water Balance" spreadsheet is to calculate water production requirements. This calculation is carried out using the water demand pro-

jections in the "W&WW Demand" spreadsheet as well as additional data entered in data input spreadsheets by the user on the:

- split of total water production into surface water and groundwater;
- volumes of own water consumption at the utility;
- volumes of water purchased from outside;
- levels of water losses as percentage of the total water for pumping into distribution network.

Using the current and forecasted levels of water demand and all entered data, the total water production requirement is calculated. Figure 11 shows the water balance calculation spreadsheet.

Figure 11 Water balance calculation

FINANCIAL PLANNING TOOL					
Back					
WATER BALANCE		31-12-2004	31-12-2005	31-12-2006	31-12-2007
		Historical	Historical	Historical	Forecast
Calculation of water balance					
Water production	000 m3	83.139	89.038	90.132	85.676
Surface	000 m3	82.308	88.148	89.230	84.819
Ground	000 m3	831	890	901	857
Own consumption of water	000 m3	1.949	1.660	1.767	1.680
Water purchased	000 m3	-	-	-	-
Water for Distribution Network	000 m3	81.191	87.378	88.364	83.996
Water losses	000 m3	32.476	34.951	35.346	31.015
Meter error - domestic	000 m3	4.971	6.269	5.413	5.407
Meter error - non-domestic	000 m3	792	792	792	792
Illegal - domestic	000 m3	-	-	-	-
Illegal - non-domestic	000 m3	-	-	-	-
Water sold	000 m3	48.714	52.427	53.019	52.981
DETAILED WATER LOSS CALCULATION					
Distribution- input	m3/year	81.191	87.378	88.364	83.996
Sold -Billed Water	m3/year	48.714	52.427	53.019	52.981
Sold -Billed Authorised	m3/year	48.714	52.427	53.019	52.981
Billed Metered Auth.Cons.	m3/year	46.721	50.293	50.993	50.959
Domestic	m3/year	30.875	34.447	35.147	35.113
Non-Domestic	m3/year	15.846	15.846	15.846	15.846
Billed Unmetered Auth.Cons.	m3/year	1.994	2.133	2.026	2.022
Domestic	m3/year	1.994	2.133	2.026	2.022
Non-Domestic	m3/year	-	-	-	-
Unbilled & authorised (NR/W)	m3/year	1.949	1.660	1.767	1.680

4.9 Fixed assets

The purpose of this chapter is to calculate values of fixed assets on the balance of water utility as well as the amounts of respective depreciation. All calculations are conducted separately for water assets and wastewater assets.

No data entry into this worksheet is necessary and cell values are derived on the basis of defined formulas. However, substantial amount of data input is required in Input-TD worksheet in order for this sheet to be able to conduct all its calculations. Particularly, the historical values for all water utility assets needs to be entered by user in Input-TD sheet as described in section 5.1.

Figure 12 Fixed asset calculation

FINANCIAL PLANNING TOOL							
Back							
FIXED ASSETS		31-12-2004	31-12-2005	31-12-2006	31-12-2007	31-12-2008	31-12-2009
		Historical	Historical	Historical	Forecast	Forecast	Forecast
Asset category 3 - Machinery and Equipment							
Period - beginning gross value	000' LCU	223.469	236.231	242.498	248.219	248.219	248.219
Investments	000' LCU	-	-	-	-	-	-
Disposals	000' LCU	-	-	-	-	-	-
Period end - gross value	000' LCU	236.231	242.498	248.219	248.219	248.219	248.219
Depreciation	000' LCU	-	-	-	23.581	23.581	23.581
Accumulated depreciation	000' LCU	110.360	119.227	127.984	151.565	175.146	198.727
Period end - net book value	000' LCU	125.871	123.271	120.235	96.654	73.073	49.492
Asset category 4 - Transmission lines/pipes							
Period - beginning gross value	000' LCU	-	-	-	-	-	-
Investments	000' LCU	-	-	-	-	-	-
Disposals	000' LCU	-	-	-	-	-	-
Period end - gross value	000' LCU	-	-	-	-	-	-
Depreciation	000' LCU	-	-	-	-	-	-
Accumulated depreciation	000' LCU	-	-	-	-	-	-
Period end - net book value	000' LCU	-	-	-	-	-	-
Asset category 5 - Other							
Period - beginning gross value	000' LCU	500	526	611	666	666	666
Investments	000' LCU	-	-	-	-	-	-
Disposals	000' LCU	-	-	-	-	-	-
Period end - gross value	000' LCU	526	611	666	666	666	666
Depreciation	000' LCU	-	-	-	57	57	57
Accumulated depreciation	000' LCU	269	338	394	451	508	566
Period end - net book value	000' LCU	257	273	272	215	157	100
TOTAL FIXED ASSETS - WASTEWATER							
Period - beginning gross value	000' LCU	289.407	301.086	307.442	313.441	313.441	313.441
Investments	000' LCU	-	-	-	-	-	-
Disposals	000' LCU	-	-	-	-	-	-
Period end - gross value	000' LCU	301.086	307.442	313.441	313.441	313.441	313.441
Depreciation	000' LCU	-	-	-	25.336	25.336	25.336
Accumulated depreciation	000' LCU	146.675	157.376	167.888	193.224	218.560	243.895
Period end - net book value	000' LCU	154.411	150.066	145.553	118.205	94.881	69.546

Figure 12 above shows part of the "Fixed assets" worksheet. The entire assets are broken down into five major asset categories:

- Asset category 1 - Buildings;
- Asset category 2 - Constructions;
- Asset category 3 - Machinery and Equipment;
- Asset category 4 - Transmission lines/pipes;
- Asset category 5 - Other.

For each category the following breakdown in the worksheet is made and respectively, each variable calculated in the "Fixed assets" worksheet:

- Period - beginning gross value;

- Investments;
- Disposals;
- Period end - gross value;
- Depreciation;
- Accumulated Depreciation;
- Period end - net book value.

4.10 Costs

The purpose of this worksheet is to calculate all costs associated with water utility operations in the course of providing water and wastewater services. Costs are calculated separately for water-related activities and for wastewater-related activities.

The following cost items are calculated for water-related activities:

- Electricity cost;
- Cost of fuel equivalent;
- Cost of spare parts for water system;
- Cost of chemicals and material for water treatment;
- Cost of purchased water;
- Maintenance cost;
- Staff and office costs allocated to water services;
- Other (not accounted in any category above) costs allocated to water services;

The following cost items are calculated for wastewater-related activities:

- Electricity cost;
- Cost of fuel equivalent;
- Cost of spare parts for wastewater system;
- Cost of chemicals and material for wastewater treatment;
- Cost of wastewater outsourced for treatment;

- Maintenance cost;
- Staff and office costs allocated to wastewater services;
- Other (not accounted in any category above) costs allocated to wastewater services.

Figure 13 below shows the snapshot of the screen for the cost calculation worksheet.

Figure 13 Cost calculation worksheet

FINANCIAL PLANNING TOOL							
Back							
COSTS			31-12-2004	31-12-2005	31-12-2006	31-12-2007	31-12-2008
			Historical	Historical	Historical	Forecast	Forecast
Gas consumption equivalent - water supply, including CIP effect	m ³ /1000m ³ of water produced		63,6	85,2	62,9	62,9	62,9
Gas consumption - water supply	m ³		5.283.900	7.585.200	5.668.200	5.387.980	5.116.133
Gas price	LCU/m ³		1,09	1,00	2,14	2,16	2,18
Cost	000' LCU		5.759	7.585	12.130	11.646	11.169
Fuel							
Fuel consumption equivalent - water supply, excluding CIP effect	l/1000 m ³ of water produced		18,1	18,0	17,0	17,0	17,0
Fuel consumption equivalent - water supply, including CIP effect	l/1000m ³ of water produced		18,1	18,0	17,0	17,0	17,0
Fuel consumption - water supply	l		1.500.750	1.601.100	1.534.500	1.458.639	1.385.044
Fuel price	LCU/l		8,80	8,80	12,00	12,12	12,24
Cost of fuel	000' LCU		13.207	14.030	18.414	17.679	16.955
Spare parts							
Share of spare parts to water	%		80%	80%	80%	80%	80%
Total nominal cost of spare parts for water system	000' LCU		1.930	2.634	2.143	2.250	2.339
Chemicals and other material for water treatment costs							
Surface water for treatment	000 m ³		82.308	88.148	89.230	84.819	80.539
Ground water for treatment	000 m ³		831	890	901	857	814
Unit cost of material for surface water treatment, excluding CIP effect	LCU/m ³		0,02	0,02	0,03	0,03	0,03
Unit cost of material for surface water treatment, including CIP effect	LCU/m ³		0,02	0,02	0,03	0,03	0,03
Unit cost of material for ground water treatment, excluding CIP effect	LCU/m ³		0,20	0,05	0,20	0,20	0,20
Unit cost of material for ground water treatment, including CIP effect	LCU/m ³		0,20	0,05	0,20	0,20	0,20
Total cost of material for treatment	000' LCU		1.850	2.104	3.006	3.022	3.034
Cost of purchased water							
Total water purchased	000 m ³		-	-	-	-	-
Price of water	LCU/m ³		0,00	0,00	0,00	0,00	0,00
Total cost of purchased water	000' LCU		-	-	-	-	-
Maintenance costs							
Water related real term maintenance cost, excluding CIP effect	000' LCU		203.475	217.880	231.593	231.593	231.593
Water related real term maintenance cost, including CIP effect	000' LCU		203.475	217.880	231.593	231.593	231.593
Water related nominal term maintenance cost	000' LCU		203.475	217.880	231.593	244.909	258.991

4.11 Tariff calculation

The purpose of this spreadsheet is to provide a calculation on tariffs applicable to various customer groups for water and wastewater services respectively. A detailed description of the structure, functionalities, and procedures for working with this spreadsheet are described in section 6.

4.12 Revenues and collection

The purpose of this worksheet is to calculate amount of sales in monetary term generated by water utility from its water and wastewater related activities. The calculation is primarily based on figures derived for:

- Water consumption levels and wastewater discharge levels by different customer groups ("W&WW Demand" worksheet);

- Tariff levels per m³ of consumed services ("Tariff Calculation" worksheet);
- Several assumptions from data input sheets, for example, assumptions on the level of full-cost tariff recovery limits for households.

Sales figures are derived separately for water and wastewater services for each of the following customer group:

- Residential sector;
- Industry;
- Budgetary organisations;
- Commercial units;
- District heating providers.

Calculations are conducted for each category as:

- including VAT tax (value-added tax);
- excluding VAT tax.

Figure 14 below demonstrates upper part of the sales (revenue) calculation worksheet.

Figure 14 Revenue calculation worksheet

FINANCIAL PLANNING TOOL							
Back							
REVENUES							
			31-12-2004 Historical	31-12-2005 Historical	31-12-2006 Historical	31-12-2007 Forecast	31-12-2009 Forecast
SALES, VOLUMES							
Water							
Water sales to residential sector	000 m3		32.868	36.581	37.173	37.135	
Water sales to industry	000 m3		6.291	6.291	6.291	6.291	
Water sales to budgetary organisations	000 m3		2.647	2.647	2.647	2.647	
Water sales to commercial units	000 m3		-	-	-	-	
Water sales to district heating providers	000 m3		6.908	6.908	6.908	6.908	
Total water billed	000 m3		48.714	52.427	53.019	52.981	
Wastewater							
Wastewater sales to residential sector	000 m3		29.143	32.687	31.263	31.235	
Wastewater sales to industry	000 m3		6.291	6.291	6.291	6.291	
Wastewater sales to budgetary organisations	000 m3		2.647	2.647	2.647	2.647	
Wastewater sales to commercial units	000 m3		-	-	-	-	
Wastewater sales to district heating providers	000 m3		6.908	6.908	6.908	6.908	
Total wastewater billed	000 m3		44.989	48.533	47.109	47.081	
SALES INCLUDING VAT, 000' LCU							
Water							
Water sales to residential sector	000' LCU		222.150	241.778	257.432	178.185	
Water sales to industry	000' LCU		44.645	52.391	54.895	88.747	
Water sales to budgetary organisations	000' LCU		18.785	22.044	23.097	26.672	
Water sales to commercial units	000' LCU		-	-	-	-	
Water sales to district heating providers	000' LCU		49.024	57.529	60.279	69.608	
Total sum of privileges and exemptions	000' LCU		-	-	-	-	
Total water billed	000' LCU		334.604	373.741	395.702	363.212	
Wastewater							
Wastewater sales to residential sector	000' LCU		158.480	86.053	180.323	126.084	
Wastewater sales to industry	000' LCU		41.052	19.874	43.543	71.105	
Wastewater sales to budgetary organisations	000' LCU		17.273	8.362	18.321	21.370	
Wastewater sales to commercial units	000' LCU		-	-	-	-	

At the bottom part of the same worksheet the expected proceeds from budget is calculated. It takes into account two budget resource flows:

- related with compensation of inter-tariff difference for households;
- related with specific payment privileges for certain customer groups;

Figure 15 below shows that part of the revenue calculation worksheet.

Figure 15 Bottom part of the "Revenue" worksheet with calculation of expected proceeds from budget

FINANCIAL PLANNING TOOL							
Back							
REVENUES							
			31-12-2004 Historical	31-12-2005 Historical	31-12-2006 Historical	31-12-2007 Forecast	31-12-2009 Forecast
Wastewater tariff for district heating providers	LCU/m3		6,53	3,16	6,92	8,07	8,57
Budget resources, excluding VAT							
Budget compensation for inter-tariff difference	000' LCU		-	-	-	202.846	214.116
Budget compensation for privileges and exemptions	000' LCU		-	-	-	-	223.142
Total budget resources committed	000' LCU		-	-	-	202.846	214.116
Budget resources, including VAT							
Budget compensation for inter-tariff difference	000' LCU		25.616	20.235	27.519	234.756	247.808
Budget compensation for privileges and exemptions	000' LCU		-	-	-	-	258.272
Total budget resources committed	000' LCU		25.616	20.235	27.519	234.756	247.808

4.13 Collection

Sales (billing) and actually collected monetary proceeds from different customer groups can sometimes be substantially different from each other. This worksheet is developed with the purpose to take into account such difference.

Its main function is very simple. It basically takes the total sales figures from the "Revenue" worksheet and applies collection ratio assumptions in "Input-TD" worksheet to get actual collected cash in each period.

As in the "Revenue" sheet, all calculations here are conducted separately for water and wastewater, for each customer group, and including or excluding VAT.

Part of the payment for the current year's billing that has not been received is then treated as receivables to be attempted to be recovered in future periods or to be written-off as bad debt, depending on applicability of such option in local conditions.

Figure 16 Collection sheet snapshot

FINANCIAL PLANNING TOOL					
Back					
BILLING AND COLLECTION			31-12-2004	31-12-2005	31-12-2006
			Historical	Historical	Historical
SALES EXCLUDING VAT, 000' LCU					
Water					
Water sales to residential sector	000' LCU		222.150	241.778	257.432
Water sales to industry	000' LCU		44.645	43.659	45.746
Water sales to budgetary organisations	000' LCU		18.785	18.370	19.248
Water sales to commercial units	000' LCU		-	-	-
Water sales to district heating providers	000' LCU		49.024	47.941	50.232
Total water billed	000' LCU		334.604	351.747	372.657
Wastewater					
Wastewater sales to residential sector	000' LCU		158.480	86.053	180.323
Wastewater sales to industry	000' LCU		34.210	16.562	36.286
Wastewater sales to budgetary organisations	000' LCU		14.394	6.969	15.268
Wastewater sales to commercial units	000' LCU		-	-	-
Wastewater sales to district heating providers	000' LCU		37.565	18.186	39.845
Total wastewater billed	000' LCU		244.650	127.770	271.721
RESIDENTIAL COLLECTIONS					
TOTAL BILLED	000' LCU		380.631	327.830	437.755
Receivables - period end	000' LCU		122.415	142.965	157.312
For collection	000' LCU		380.631	450.246	580.720
Collection	000' LCU		300.318	351.642	491.870
Bad debt	000' LCU		-	-	-
Accumulated bad debt	000' LCU		-	-	-
Booked receivables	000' LCU		122.415	142.965	157.312
NON-RESIDENTIAL COLLECTIONS					
TOTAL BILLED	000' LCU		198.624	151.687	206.624
Receivables - period end	000' LCU		117.524	115.067	121.792
For collection	000' LCU		198.624	269.211	321.691
Collection	000' LCU		181.542	277.018	295.956
Bad debt	000' LCU		-	-	-
Accumulated bad debt	000' LCU		-	-	-

4.14 Taxation

The purpose of this spreadsheet is to provide the user with the possibility to determine which fees and taxes are to be paid by the Water Utility and calculate those fees and tax payments. A detailed description of the structure, functionalities, and procedures for working with this spreadsheet are described in section 8 Taxation.

4.15 Financing

The purpose of this worksheet is to calculate all variables related with financing water utility activities through different types of credit. As it is described in section 5.1, user has a possibility to decide himself whether credit financing will be used to fund investment activities he wants to implement at the water utility. If he selects to have credits (loans), then this worksheet "Financing" automatically take the total amount of the loan decided by user and calculates all the related interest and principal repayments.

At the upper part of the worksheet terms of five types of the loan, specified by user in input sheet Input-TI, is replicated (see Figure 17).

Figure 17 Upper part of "Financing" worksheet with loan terms

FINANCIAL PLANNING TOOL		
Back		
FINANCING		
Payment periods		
Loan 1 payment period	Years	15
Loan 1 grace period	Years	3
Loan 2 payment period	Years	8
Loan 2 grace period	Years	0
Loan 3 payment period	Years	15
Loan 3 grace period	Years	3
Loan 4 payment period	Years	15
Loan 4 grace period	Years	3
Loan 5 payment period	Years	15
Loan 5 grace period	Years	3
Funding costs		
LOAN 1		
Base rate	%	1,00%
Margin	%	1,00%
LOAN 2		
Base rate	%	3,00%
Margin	%	2,00%
LOAN 3		
Base rate	%	1,00%
Margin	%	1,00%
LOAN 4		
Base rate	%	1,00%
Margin	%	1,00%
LOAN 5		
Base rate	%	1,00%
Margin	%	1,00%

User has the possibility to select between types of loan at the same time. This worksheet then calculates all repayment values for both of the loans separately (see Figure 18)

It is important to note that payment period is entered as agreed with bank. The grace period, however, is entered starting from the first forecast year. Say, if the first forecast year is 2006 and the loan starts beginning of 2008 with grace period of 3 years then for the model input purposes the grace period needs to be entered as 5 years (2006-2010).

Figure 18 Loan calculations in "Financing" worksheet

FINANCIAL PLANNING TOOL										
Back										
FINANCING				31-12-2004	31-12-2005	31-12-2006	31-12-2007	31-12-2008	31-12-2009	31-12-2010
				Historical	Historical	Historical	Forecast	Forecast	Forecast	Forecast
Loan 2 repayment schedule	% of total			0,00%	0,00%	0,00%	12,50%	12,50%	12,50%	12,50%
Loan 3 repayment schedule	% of total			0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	6,67%
Loan 4 repayment schedule	% of total			0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	6,67%
Loan 5 repayment schedule	% of total			0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	6,67%
Loan 1 cash drawdown	000' LCU	5.794	-	-	-	466	466	466	466	466
water related	000' LCU	5.794	-	-	-	466	466	466	466	466
wastewater related	000' LCU	-	-	-	-	-	-	-	-	-
Loan 1, total cumulative	000' LCU	24.970	-	-	-	466	932	1.398	1.864	1.864
water related	000' LCU	24.970	-	-	-	466	932	1.398	1.864	1.864
wastewater related	000' LCU	-	-	-	-	-	-	-	-	-
Loan 2 cash drawdown	000' LCU	350.000	-	-	-	-	-	-	-	-
water related	000' LCU	-	-	-	-	-	-	-	-	-
wastewater related	000' LCU	350.000	-	-	-	-	-	-	-	-
Loan 2, total cumulative	000' LCU	1.400.000	-	-	-	-	-	-	-	-
water related	000' LCU	-	-	-	-	-	-	-	-	-
wastewater related	000' LCU	1.400.000	-	-	-	-	-	-	-	-
Loan 3 cash drawdown	000' LCU	5.794	-	-	-	466	466	466	466	466
water related	000' LCU	5.794	-	-	-	466	466	466	466	466
wastewater related	000' LCU	-	-	-	-	-	-	-	-	-
Loan 3, total cumulative	000' LCU	24.970	-	-	-	466	932	1.398	1.864	1.864
water related	000' LCU	24.970	-	-	-	466	932	1.398	1.864	1.864
wastewater related	000' LCU	-	-	-	-	-	-	-	-	-
Loan 4 cash drawdown	000' LCU	5.794	-	-	-	466	466	466	466	466
water related	000' LCU	5.794	-	-	-	466	466	466	466	466
wastewater related	000' LCU	-	-	-	-	-	-	-	-	-
Loan 4, total cumulative	000' LCU	24.970	-	-	-	466	932	1.398	1.864	1.864
water related	000' LCU	24.970	-	-	-	466	932	1.398	1.864	1.864
wastewater related	000' LCU	-	-	-	-	-	-	-	-	-
Loan 5 cash drawdown	000' LCU	5.794	-	-	-	466	466	466	466	466
water related	000' LCU	5.794	-	-	-	466	466	466	466	466

4.16 Capital expenditure planning spreadsheets

The purpose of this spreadsheet is to allow the user to select investment projects to be implemented at the Water Utility, to take into account the effect of such investments on the Water Utility's running costs and financial standing, and to evaluate the overall effect of new investments on the financial position of the water company. A detailed description of the structure, functionalities, and procedures for working with this spreadsheet are described in a section below.

4.17 Financial statements

The purpose of this spreadsheet is to construct an overview of the financial situation of the Water Utility by providing the following statements: Profit and Loss Account, Balance spreadsheet, and Cash Flow Statement.

4.18 Affordability analysis

The purpose of this spreadsheet is to calculate how much of the monthly bill for water and wastewater for households constitutes each person's average monthly income. Firstly, the average amount of billed water and wastewater per person is calculated. Next, the monthly water and wastewater bill per person is calculated based on the average per capita consumption volumes and calculated tariffs. Finally, the monthly bill is compared to the average monthly per capita income for five income groups (quintiles).

Figure 19 Affordability levels calculation

FINANCIAL PLANNING TOOL							
Back							
AFFORDABILITY			31-12-2004 Historical	31-12-2005 Historical	31-12-2006 Historical	31-12-2007 Forecast	31-12-2008 Forecast
19	Water tariff for residential customers	LCU/m ³	6,76	6,61	6,93	4,80	5,05
20	Wastewater tariff for residential customers	LCU/m ³	5,44	2,63	5,77	4,04	4,28
MONTHLY WATER BILL							
Water bill							
25	metered	LCU	30,2	32,3	34,3	23,7	25,0
26	un-metered	LCU	13,5	16,6	36,8	25,5	26,8
Wastewater bill							
29	metered water households	LCU	23,4	12,5	27,5	19,2	20,4
30	un-metered water households	LCU	4,7	2,0	40,9	28,6	30,4
31					0,006		
32	Total monthly bill						
33	metered	LCU	53,6	44,8	61,7	42,9	45,3
34	un-metered	LCU	18,2	18,6	77,8	54,1	57,1
MONTHLY INCOME BY QUINTILES							
37	Average monthly per capita income - 1st quintile	LCU	2.391,0	3.275,0	4.486,0	4.486,0	4.575,7
38	Average monthly per capita income - 2nd quintile	LCU	1.913,0	2.620,0	3.589,0	3.589,0	3.660,8
39	Average monthly per capita income - 3rd quintile	LCU	1.530,0	2.096,0	2.871,0	2.871,0	2.928,4
40	Average monthly per capita income - 4th quintile	LCU	1.224,0	1.677,0	2.297,0	2.297,0	2.342,9
41	Average monthly per capita income - 5th quintile	LCU	980,0	1.342,0	1.838,0	1.838,0	1.874,8
MONTHLY BILL INCLUDING VAT AS % OF INCOME IN A GIVE QUINTILE							
1st quintile							
46	metered households	%	2,2%	1,4%	1,4%	1,0%	1,0%
47	un-metered households	%	0,8%	0,6%	1,7%	1,2%	1,2%
2nd quintile							
50	metered households	%	2,8%	1,7%	1,7%	1,2%	1,2%
51	un-metered households	%	1,0%	0,7%	2,2%	1,5%	1,6%

In order to carry out the calculations in this module, the user will need to enter data on the average per capita income and estimated percentage change in income over a period of time. Figure 19 above shows the snapshot of the Affordability Levels Calculation spreadsheet.

Once the affordability levels have been calculated they need to be assessed and compared with generally accepted limits. No specific limitation on the level of tariffs can be provided/set, as local conditions may vary from country to country or, even from city to city. However, for the EECCA area, based on the practical experience, the level of 3-4% of annual income paid for all water and wastewater related services is considered to be an affordability limit.

The FPTWU Tool does not provide for adjustment of tariffs automatically, should the affordability limit stated here be exceeded. Users will need to consider the affordability limit in regard to the local situation and revise tariffs if necessary, or provide local budget support to households with especially severe affordability problems.

5 Data input requirements

This section provides an overview of the data input required for the spreadsheets “Input-TI” and “Input-TD”. Most of the numerical data needed to perform the Tools calculations has to be entered here.

5.1 Time independent data entry - Input-TI

The “Input-TI” spreadsheet is divided into 11 different "time independent" input data categories. The relevant heading identifies each of these input categories. Table 2 provides an overview of the 11 categories.

Table 2 *Input-TI spreadsheet data categories*

Input data category	Used in spreadsheet or calculation of
TIMING	Timing flags
TAXATION ASSUMPTIONS	Tax calculation Tariff calculation VAT
DEPRECIATION RATES	Fixed Assets CIP_Investments
FINANCING ASSUMPTIONS	Financing
TECHNICAL ASSUMPTIONS	W&WW Demand
OTHER	CIP_Own Input
UNIT COSTS	Costs
INDEXATION ASSUMPTIONS	Indexation
STAFF COST DATA	Costs
STAFF NUMBERS DATA	Costs
MANUAL DATA INPUT SELECTOR	General

There are two cells marked in yellow for each variable which requires data input (see Figure 20). This is because the data in the first cell will be used for carrying out nominal calculations, while the data in the second (right-hand) cell will be used for real term calculations.

Switching between real and nominal calculations is done by selecting "1" or "0" in cell C5. Depending on the selection, either the left yellow coloured cell value or right yellow coloured cell value will be copied into column C, and will thereafter be used for all model calculations. Please note that most of the variables entered will be the same in both cells and only inflation data in the yellow cells will differ.

Figure 20 There are two yellow cells for each variable that need data input

FINANCIAL PLANNING TOOL				
Back				
Select NOMINAL/REAL case		1	1	2
Case in use		NOMINAL	NOMINAL	REAL
1. TIMING				
End of first period	Date	31Mar 2005	31/03/2005	31/03/2005
Model period length	Month	3	3	3
Number of month per year	Months	12	12	12
Number of days per year	Days	365	365	365
First year in the modelling period	year	2005	2005	2005
Historical data period length	Periods	4	4	4
2. TAXATION ASSUMPTIONS				
Income tax rate				
Income tax rate on water and wastewater income	%	20% Applicable rate	20%	20%
VAT tax				
VAT on income receipts - population	%	20% Applicable rate	20%	20%
VAT on income receipts - industry	%	20% Applicable rate	20%	20%
VAT on income receipts - budget entities	%	20% Applicable rate	20%	20%
VAT on income receipts - commerces	%	20% Applicable rate	20%	20%
VAT on income receipts - district heating	%	20% Applicable rate	20%	20%
VAT tax rate on expenditure	%	20% Applicable rate	20%	20%
VAT payments	months	1 Payment frequenc	1	1
3. DEPRECIATION RATES				
Asset category 1 - Buildings	%, annual rate	1.50% Straight line	1.50%	2.20%
Asset category 2 - Constructions	%, annual rate	2.00% Straight line	2.00%	2.20%
Asset category 3 - Machinery and Equipment	%, annual rate	3.00% Straight line	3.00%	5.00%
Asset category 4 - Transmission lines/pipes	%, annual rate	2.00% Straight line	2.00%	6.00%
Asset category 5 - Other	%, annual rate	5.00% Straight line	5.00%	30.00%
Asset category 5 - Other, period 1	%, annual rate for period 1	30.00% Accelerated	30.00%	30.00%
Asset category 5 - Other, period 2	%, annual rate for period 2	20.00% Accelerated	20.00%	20.00%
Asset category 5 - Other, period 1	years	5 Accelerated	5	5
Asset category 5 - Other, period 2	years	15 Accelerated	15	15
Select depreciation method	1=accelerated, 0=straight line	1 Accelerated	1	0

5.1.1 Timing

Data in this section are defined by the user and determine the time frame and the period/duration of the model.

Figure 21 Timing data entry section

1. TIMING				
End of first period	Date	31Mar 2005	31/03/2005	31/03/2005
Model period length	Month	3	3	3
Number of month per year	Months	12	12	12
Number of days per year	Days	365	365	365
First year in the modelling period	year	2005	2005	2005
Historical data period length	Periods	4	4	4

The following variables are included in this category and need to be entered by the user in the unit measures/measurements specified in Table 3.

Table 3 Variables in the category

Input parameter	Unit measure
End of first period	Date, indicates the end of the first year in the model
Model period length	Month, indicates the number of month in a year
Number of month per year	Months, indicates the number of month in a year
Number of days per year	Days, indicates the number of days in a year
First year in the modelling period	Year, indicates the year when the model starts
Historical data period length	Periods, indicates the number of historical periods/years in a year

5.1.2 Taxation assumptions

In this section the user is asked to enter the taxation assumptions applicable to the Water Utility. The current rate of taxation, in accordance with local legislation, needs to be entered here. Two types of tax rates will have to be defined - the rate of income tax and data on VAT tax payments. The table below provides an overview of the variables required for this section.

Table 4 Taxation variables

Input parameter	Unit measure
Income tax rate on water and wastewater income	%, defines the percentage of income before tax to be paid by utility as income tax
VAT tax rate on income receipts	%, defines the percentage of VAT on receipts
VAT tax rate on expenditure	%, defines the percentage of VAT on expenditure
VAT payments	months, determines frequency of VAT payments settlement in months

5.1.3 Depreciation

In this section the user is asked to enter data on the depreciation of the fixed assets. All assets are assumed to depreciate following a straight line depreciation schedule. The asset category "Other" can also be depreciated on accelerated basis by selecting corresponding option. The annual rate of depreciation needs to be entered by the user in the respective cells, see examples in Figure 22.

Figure 22 Depreciation input section

3. DEPRECIATION RATES				
Asset category 1 - Buildings	% annual rate	1.50% Straight line	1.50%	2.20%
Asset category 2 - Constructions	% annual rate	2.00% Straight line	2.00%	2.20%
Asset category 3 - Machinery and Equipment	% annual rate	3.00% Straight line	3.00%	5.00%
Asset category 4 - Transmission lines/pipes	% annual rate	2.00% Straight line	2.00%	6.00%
Asset category 5 - Other	% annual rate	5.00% Straight line	5.00%	30.00%
Asset category 5 - Other, period 1	% annual rate for period 1	30.00% Accelerated	30.00%	30.00%
Asset category 5 - Other, period 2	% annual rate for period 2	20.00% Accelerated	20.00%	20.00%
Asset category 5 - Other, period 1	years	5 Accelerated	5	5
Asset category 5 - Other, period 2	years	15 Accelerated	15	15
Select depreciation method	1= accelerated, 0=straight line	1 Accelerated	1	0

Table 5 below provides an overview of the variables required for the Depreciation section.

Table 5 Depreciation input variables

Input parameter	Unit measure
Asset category 1 - Buildings	% annual rate, defines the annual rate of depreciation of this asset category
Asset category 2 - Constructions	% annual rate, defines the annual rate of depreciation of this asset category
Asset category 3 - Machinery and Equipment	% annual rate, defines the annual rate of depreciation of this asset category
Asset category 4 - Transmission lines/pipes	% annual rate, defines the annual rate of depreciation of this asset category
Asset category 5 - Other	% annual rate, defines the annual rate of depreciation of this asset category

The depreciation rates are entered on an annual basis. However, as the model is built on a annual basis, the annual rate is adjusted to a annual level before being applied to the asset value.

5.1.4 Financing assumptions

In this section, the user will have to enter data on financing terms for loans and working capital, if needed. Two types of loans are generally specified in the model in order to reflect varying loan conditions. Before entering this data, as shown in Figure 23, the user will need to carry out a brief investigation of the market for terms of available short and long-term credit financing.

Figure 23 Financing assumptions

FINANCIAL PLANNING TOOL				
Back				
Select depreciation method	1= accelerated, 0= straight line	0 Straight line	0	0
4. FINANCING ASSUMPTIONS				
<i>Repayment periods</i>				
Loan 1				
repayment	Years	15	15	15
grace period	Years	3	3	3
Loan 2				
repayment	Years	8	8	8
grace period	Years	0	0	0
Loan 3				
repayment	Years	15	15	15
grace period	Years	3	3	3
Loan 4				
repayment	Years	15	15	15
grace period	Years	3	3	3
Loan 5				
repayment	Years	15	15	15
grace period	Years	3	3	3
<i>Funding costs</i>				
Loan 1				
base rate	%	1,00%	1%	1%
margin	%	1,00%	1,0%	1%
Loan 2				
base rate	%	3,00%	3%	3%
margin	%	2,00%	2%	2%
Loan 3				
base rate	%	1,00%	1%	1%
margin	%	1,00%	1,0%	1%
Loan 4				
base rate	%	1,00%	1%	1%

The table below provides an overview of the variables required for entering input in this section on Financing assumptions.

Table 6 Financing assumptions

Input parameter	Unit measure
Loan repayment period	Years, number of years over which the loan principle is repaid
Loan grace period	Years, number of years for which the repayment of loan principal is postponed
Base rate	%, base rate for loan interest payment typically linked to EURIBOR or LIBOR rates
Margin	%, margin over the base rate

5.1.5 Technical assumptions

Most of the technical parameters are time dependant, however, some of these are difficult to update on an annual basis or are subject to little or no variation during the year and can be treated as time-independent. This section allows the user to enter any technical assumptions.

Table 7 provides an overview of the variables required for entering input in the section on Technical assumptions.

Table 7 *Technical assumptions*

Input parameter	Unit measure
Current water loss level	% of water for distribution, defines what part of the total water pumped into the network is lost
Length of water pipes network	km, to enter data on total length of the water pipe network
Length of wastewater pipe network	km, to enter data on total length of the wastewater pipe network
Surface water share in total water production	%, defines which percentage of water production comes from surface water sources

5.1.6 Other

In this section two specific assumptions are entered:

- discount rate;
- base date for discounting.

Table 8 provides an overview of the variables required for entering input in the section on Other assumptions.

Table 8 *Other assumptions*

Input parameter	Unit measure
Discount rate - for NPV calculation	%, the user enters the discount rate which will be used for cash flow discounting and reflects local risk
Base date to which cash flows will be discounted	Date, specific date to which all the cash flows are to be discounted

5.1.7 Unit cost assumptions

Most of the unit cost parameters will vary with time, however, as in the case of technical assumptions, some are especially difficult to update on an annual basis or vary little during the year, these can be treated as time-independent. This section allows the user to enter unit cost assumptions.

Table 9 provides an overview of the variables required for entering input in the section on Unit cost assumptions.

Table 9 Unit cost assumptions

Input parameter	Unit measure
International price of electricity - upper limit for price increase	LCU/KWh, the user needs to investigate and enter here international price of a unit of energy, which is then used as the upper limit for the local price of electricity increase.
Local price of purchased water	LCU/m ³ , price of m ³ of water if it is to be purchased from outside provider
Local price of outsourced wastewater treatment	LCU/m ³ , price of m ³ of wastewater if it is outsourced to be treated externally

5.1.8 Indexation assumptions

In this section two specific assumptions are entered:

- Indexation base date;
- Selector for switch between nominal or real calculations.

Table 10 provides overview of the variables required for entering input in the section on Indexation assumptions.

Table 10 Indexation assumptions

Input parameter	Unit measure
Indexation base date	Date, the specific date which will be used as a reference base date for all the relevant variables indexation
Nominal/Real	1 or 0, if 1 the calculations are nominal term, if 0 the calculations are real term

5.1.9 Staff costs and staff numbers data

In this section the user will have to enter data on the initial (starting) number of staff of each category provided, as well as the total salary cost related to that specific staff category. The information is then used in the Costs spreadsheet to calculate the developments in the number of staff and developments in the cost of each staff category. The following staff categories are selected:

- Administration and Management;
- Service personnel;
- Workers;

- Auto service personnel.

Figure 24 Staff costs and number data

	A	B	C	D	E	F
1	FINANCIAL PLANNING TOOL FOR WATER UTILITIES IN EECCA REGION			Back		
2						
3						
4						
87	STAFF COST DATA					
88	Administration and Management	000' LCU	10,545	Annual Cost	10,545	10,545
89	Service personnel	000' LCU	7,354	Annual Cost	7,354	7,354
90	Workers	000' LCU	18,497	Annual Cost	18,497	18,497
91	Autoservice personnel	000' LCU	8,265	Annual Cost	8,265	8,265
92						
93	Office Costs	% of staff costs	5,00%		5,00%	5,00%
94	Administrative costs	% of staff costs	5,00%		5,00%	5,00%
95						
96	STAFF NUMBERS DATA					
97	Administration and Management	Number	179		179	179
98	Service personnel	Number	200		200	200
99	Workers	Number	564		564	564
100	Autoservice personnel	Number	197		197	197
101						

Table 11 provides an overview of the variables required for entering input in the section on Staff costs and staff numbers.

Table 11 Staff costs and staff numbers

Input parameter	Unit measure
Administration and Management	000' LCU, in this cell the annual cost of salary for this specific staff category needs to be entered
Service personnel	000' LCU, in this cell the annual cost of salary for this specific staff category needs to be entered
Workers	000' LCU, in this cell the annual cost of salary for this specific staff category needs to be entered
Auto service personnel	000' LCU, in this cell the annual cost of salary for this specific staff category needs to be entered
Administration and Management	Number, the total number of people in this staff category
Service personnel	Number, the total number of people in this staff category
Workers	Number, the total number of people in this staff category
Auto service personnel	Number, the total number of people in this staff category
STAFF AND OFFICE COST WATER/WASTEWATER SPLIT PERCENTAGE	% to be allocated to water, the share of the total staff and office costs that will be accounted as part of the total water cost. The residual will be accounted as part of the total wastewater cost.

5.1.10 Manual data input selector

The purpose of this section can be explained by an example:

- In spreadsheet "Input-TD" row 12, the user is asked to enter the total population in the service area for selected historical periods.
- On the basis of the historical data and the estimated population growth rate the model can calculate the total population in the area for all model periods.
- It is possible, that, for some reason, the 'total population' figures calculated by the model are un-satisfactory for the user.
- In cases such as this, it is possible to select YES=1 in cells E107 and F107, and the model's calculation on forecasted population will then be blocked and the user is able to enter his own figures on the population for each period in the spreadsheet "Input-TD" row 12.

All other manual data entry selectors work in the same manner with respect to the individual variables shown in Figure 25.

Figure 25 Manual data entry section

11. MANUAL DATA INPUT SELECTOR			
Use manual input for Population in multi-storey buildings	YES=1, NO=0	-	
Use manual input for Population in private sector	YES=1, NO=0	-	
Use manual input for Population connected to water network in multi-storey buildings	YES=1, NO=0	-	
Use manual input for Population connected to water network in private sector	YES=1, NO=0	-	
Use manual input for Population connected to wastewater system in multi-storey buildings	YES=1, NO=0	-	
Use manual input for Population connected to wastewater system in private sector	YES=1, NO=0	-	
Use manual input for Water Metered multi-storey building households	YES=1, NO=0	-	
Use manual input for Water Metered private sector households	YES=1, NO=0	-	
Use manual input for Multi-storey building households connected to wastewater system and with metered water	YES=1, NO=0	-	
Use manual input for private sector households connected to wastewater system and with metered water	YES=1, NO=0	-	

5.2 Time dependent data entry - Input-TD

The "Input-TD" spreadsheet is divided into 8 different "time dependent" data categories. Table 12 provides an overview of the 8 categories.

Table 12 Input-TD spreadsheet data categories

Input data category	Used in spreadsheet or calculation of
MACROECONOMIC DATA	W&WW Demand Affordability
INFLATION	Indexation Costs

Input data category	Used in spreadsheet or calculation of
SERVICE LEVEL DATA	W&WW Demand Tariff Calculation
WATER CONSUMPTION and WASTEWATER DISCHARGE ASSUMPTIONS	W&WW Demand Tariff Calculation
TECHNICAL ASSUMPTIONS	W&WW Demand Water Balance Costs
FIXED ASSETS	Fixed Assets
HUMAN RESSOURCE DEVELOPMENT PLAN/STAFF CHANGES	Costs
OTHER	Tariff Calculation Collection Financial Statements

There are cells marked in yellow for each variable and for each year of the entire period of the model. These cells require data input (see *Figure 26*).

Figure 26 There are yellow cells for each variable and each year which require data input

FINANCIAL PLANNING TOOL		31-12-2004	31-12-2005	31-12-2006	
Back		Historical	Historical	Historical	
INPUT - TIME DEPENDANT					
MACROECONOMIC DATA					
9	Population growth rate	%	-1,34%	-1,34%	-1,34%
10	Population in multi-storey buildings	Number	624.500	625.100	602.400
11	Population in private sector	Number	98.375	99.278	101.251
12	Number of people per household	Number	2,5	2,5	2,5
13	Average per capita income, 1st quintile	LCU/c/month	2.391	3.275	4.486
14	Average per capita income, 2nd quintile	LCU/c/month	1.913	2.620	3.589
15	Average per capita income, 3rd quintile	LCU/c/month	1.530	2.096	2.871
16	Average per capita income, 4th quintile	LCU/c/month	1.224	1.677	2.297
17	Average per capita income, 5th quintile	LCU/c/month	980	1.342	1.838
18	Percentage change in monthly income per capita	%	0%	0%	0%
INFLATION					
20	Inflation rate in LCU (annual average) - CPI	%			
21	Inflation rate in LCU (annual average) - PPI	%			
22	variation in wages over/below CPI inflation rate	%			
23	Energy price inflation rate	%			
24	Chemicals and other material price increase over PPI inflation rate	%			

5.2.1 Macroeconomic data

Data in this section is entered by the user and presents (represents) the most common macroeconomic population related data. Figure 27 below shows a snapshot of the spreadsheet with macroeconomic data input.

Figure 27 Macroeconomic data entry section

FINANCIAL PLANNING TOOL		31-12-2004	31-12-2005	31-12-2006	
Back		Historical	Historical	Historical	
INPUT - TIME DEPENDANT					
MACROECONOMIC DATA					
9	Population growth rate	%	-1,34%	-1,34%	-1,34%
10	Population in multi-storey buildings	Number	624.500	625.100	602.400
11	Population in private sector	Number	98.375	99.278	101.251
12	Number of people per household	Number	2,5	2,5	2,5
13	Average per capita income, 1st quintile	LCU/c/month	2.391	3.275	4.486
14	Average per capita income, 2nd quintile	LCU/c/month	1.913	2.620	3.589
15	Average per capita income, 3rd quintile	LCU/c/month	1.530	2.096	2.871
16	Average per capita income, 4th quintile	LCU/c/month	1.224	1.677	2.297
17	Average per capita income, 5th quintile	LCU/c/month	980	1.342	1.838
18	Percentage change in monthly income per capita	%	0%	0%	0%
INFLATION					
20	Inflation rate in LCU (annual average) - CPI	%			
21	Inflation rate in LCU (annual average) - PPI	%			
22	variation in wages over/below CPI inflation rate	%			
23	Energy price inflation rate	%			
24	Chemicals and other material price increase over PPI inflation rate	%			

The following variables are included in this category and need to be entered by the user in the unit measures specified in Table 13.

Table 13 Macroeconomic data variables

Input parameter	Unit measure
Real GDP growth, annual	%, the user need to identify annual actual and forecasted GDP growth rate and enter it here on a annual basis
Population growth rate, annual	%, the user need to identify annual actual and forecasted population growth rate and enter it here on a annual basis
Population in multi-storey buildings	Number, the actual number of people living in multi-storey buildings
Population in private sector	Number, actual number of people living in private housing sector
Number of people per household	Number, averaged across all households actual and forecasted number of people per household
Average per capita income	LCU/per person/month, average statistical income per person in the given area where the Water Utility operates
Percentage change in monthly income per capita	%, forecasted change in the level of average personal income

5.2.2 Inflation assumptions

In this section the user is asked to enter inflation assumptions applicable to different parameters. Inflation rates are estimated and forecasted on an annual basis but are entered in the yellow coloured cells in this section on an annual basis.

The following variables are included in this category and need to be entered by the user in the unit measures specified in Table 14.

Table 14 *Inflation variables*

Input parameter	Unit measure
Annual Inflation rate in LCU (annual average) - CPI	%, the user need to estimate the annual CPI inflation level and input it in each yellow cell on a annual basis
Annual Inflation rate in LCU (annual average) - PPI	%, the user need to estimate the annual PPI inflation level and input it in each yellow cell on a annual basis
Annual variation in wages over/below CPI inflation rate	%, the user need to estimate the annual real wage change level and input it in each yellow cell on a annual basis
Energy price inflation rate	%, the user need to estimate the annual energy related inflation level and input it in each yellow cell on a annual basis
Chemicals and other material price increase over PPI inflation rate	%, the user need to estimate the annual real changes in chemicals and other water and wastewater treatment material inflation level and input it in each yellow cell on a annual basis

5.2.3 Service level data

In this section the user is asked to enter data related on water and wastewater service levels provided to its customer by the utility. Some of the variables entered in this section are entered for historical period only. Others are entered for each period for the duration of the model.

All service level data is presented separately for multi-storey building households, for households in the private housing sector, and for the non-household sector as demonstrated in Figure 28.

Figure 28 Service level data section in Input-TD

FINANCIAL PLANNING TOOL					
Back					
INPUT - TIME DEPENDANT			31-12-2004 Historical	31-12-2005 Historical	31-12-2006 Historical
Population connected to water network	Number		85.773	84.624	83.491
Population connected to wastewater system	Number		32.918	37.034	39.105
Water Metered private housing sector	Number		19.114	21.258	22.309
Of which, private housing sector connected to wastewater system and with metered water	Number		19.114	21.258	22.309
SERVICE LEVEL DATA - NON-HOUSEHOLD					
Industry number of water connections	Number		5.001	5.539	5.908
Budget organisations number of water connections	Number		236	245	245
Commercial entities number of water connections	Number				
District heating providers number of water connections	Number		405	377	377
Industry number of wastewater connections	Number		5.001	5.539	5.908
Budget organisations number of wastewater connections	Number		236	245	244
Commercial entities number of wastewater connections	Number				
District heating providers number of wastewater connections	Number		405	377	377
WATER CONSUMPTION ASSUMPTIONS					
Water consumption - metered multi-storey	m3		28.465.255	31.930.636	32.107.958
Water consumption - metered private	m3		2.409.268	2.516.848	3.038.658
Water consumption - un-metered multi-storey (NORM)	m3		476.099	360.630	342.983
Water consumption - un-metered private (NORM)	m3		1.517.815	1.772.588	1.682.952

Table 15 provides an overview of the variables required for entering input in this section.

Table 15 Service level input variables

Input parameter	Unit measure	Historical data entry or All periods
SERVICE LEVEL DATA - MULTISTORY BUILDINGS		
Population connected to water network	Number, actual number of people connected to the water system	Historical
Population connected to wastewater system	Number, actual number of people connected to the wastewater system	Historical
Water Metered multi-storey building households	Number, actual number of people connected to the water system and with water meters	Historical
Of which, multi-storey building households connected to wastewater system and with metered water	Number, actual number of people connected to the wastewater system and with water meters	Historical
SERVICE LEVEL DATA - PRIVATE HOUSING SECTOR		
Population connected to water network	Number, actual number of people connected to the water system	Historical
Population connected to wastewater system	Number, actual number of people connected to the wastewater system	Historical
Water Metered private housing sector	Number, actual number of people connected to the water system and	Historical

	with water meters	
Of which, private housing sector connected to wastewater system and with metered water	Number, actual number of people connected to the wastewater system and with water meters	Historical
SERVICE LEVEL DATA - NON-HOUSEHOLD		
Industry number of water connections	Number, actual and forecasted number of industrial water connections	All periods
Budget organisations number of water connections	Number, actual and forecasted number of water connections for budget organisations	All periods
Commercial entities number of water connections	Number, actual and forecasted number of water connections for commercial entities	All periods
District heating providers number of water connections	Number	
Industry number of wastewater connections	Number	
Budget organisations number of wastewater connections	Number	
Commercial entities number of wastewater connections	Number	
District heating providers number of wastewater connections	Number	

5.2.4 Water consumption and wastewater discharge assumptions

In this section user will be asked to input data for household and non-household customer group's water consumption and wastewater discharge information. The Figure 29 below present snapshot of this section in Input-TD spreadsheet.

Figure 29 Water and wastewater consumption and discharge assumptions

	A	B	C	D	E	F	G
1							
2	FINANCIAL PLANNING TOOL FOR WATER UTILITIES IN EECCA REGION		Back				
3							
4							
5	INPUT - TIME DEPENDANT				31 mar 2004	30 jun 2004	30 sep 2004
6					Historical	Historical	Historical
48	WATER CONSUMPTION ASSUMPTIONS						
49	Water consumption rate - metered multistory	led			220	220	220
50	Water consumption rate - metered private	led			200	200	200
51	Water consumption rate - un-metered multistory (NORM)	led			310	310	310
52	Water consumption rate - un-metered private (NORM)	led			310	310	310
53							
54	WASTEWATER DISCHARGE ASSUMPTIONS						
55	Wastewater discharge rate - metered water multistory households	led			198	198	198
56	wastewater/water ratio	%			90%	90%	90%
57	Wastewater discharge rate - metered water private households	led			160	160	160
58	wastewater/water ratio	%			80%	80%	80%
59	Wastewater discharge rate - un-metered water multistory households (NORM)	led			280	280	280
60	Wastewater discharge rate - un-metered water private households (NORM)	led			280	280	280
61							
62	NON-HOUSEHOLD WATER CONSUMPTION						
63	Industrial water consumption	000 m3			1500	1500	1500
64	Budgetary organisations	000 m3			2.200	2.200	2.200
65	Commercial units	000 m3			350	350	350
66	Water for district heating	000 m3			7.000	7.000	7.000
67							
68	Industrial water consumption, metering rate	%			80%	80%	80%
69	Budgetary organisations, metering rate	%			10%	10%	10%
70	Commercial units, metering rate	%			80%	80%	80%
71	Water for district heating, metering rate	%			90%	90%	90%
72							
73	Industrial water consumption variation	%					
74	metered	%			0%	0%	0%
75	un-metered	%			0%	0%	0%
76	Budgetary organisations water consumption variation	%					
77	metered	%			0%	0%	0%
78	un-metered	%			0%	0%	0%
79	Commercial units variation	%					
80	metered	%			0%	0%	0%
81	un-metered	%			0%	0%	0%
82	Water for district heating variation	%					

Water consumption data are broken down into two categories:

- Water consumption rate for metered households - average consumption rate according to water meter reading;
- Water consumption rate for un-metered households - consumption rates established by norms;

All data are to be entered separately for multi-storey building households and for households in private housing sector.

Wastewater discharge data are also broken down into two categories:

- Wastewater discharge from households with metered water;
- Wastewater discharge from households with un-metered water;

All data for wastewater discharge are also to be entered separately for multi-storey building households and for households in private housing sector.

Table below provides overview of the variables required for input in this section of Financing assumptions.

Table 16 Water consumption and wastewater discharge input data

Input parameter	Unit measure
Water consumption rate - metered	lcd, per capita per day water consumption data for metered households, all periods
Water consumption rate - un-metered	lcd, per capita per day water consumption data for un-metered households, all periods
Wastewater discharge rate - metered water	lcd, per capita per day wastewater discharge data for water metered households, all periods
Wastewater discharge rate - un-metered water	lcd, per capita per day wastewater discharge data for water metered households, all periods
Wastewater/water ratio	%, ratio of wastewater to water
Industrial water consumption	000 m ³ , only historic data on actual water consumption levels by this customer group
Budgetary organisations	000 m ³ , only historic data on actual water consumption levels by this customer group
Commercial units	000 m ³ , only historic data on actual water consumption levels by this customer group
Water for district heating	000 m ³ , only historic data on actual water consumption levels by this customer group
Industrial water consumption variation	%, for all years, estimated percentage change (increase/decrease) in water consumption volumes by this consumer group
Budgetary organisations water consumption variation	%, for all years, estimated percentage change (increase/decrease) in water consumption volumes by this consumer group
Commercial units variation	%, for all years, estimated percentage change (increase/decrease) in water consumption volumes by this consumer group
Water for district heating variation	%, for all years, estimated percentage change (increase/decrease) in water consumption volumes by this consumer group
Industrial wastewater discharge	000 m ³ , only historic data on actual wastewater discharge levels by this customer group
Budgetary organisations	000 m ³ , only historic data on actual wastewater discharge levels by this customer group
Commercial units	000 m ³ , only historic data on actual

	wastewater discharge levels by this customer group
Water for district heating	000 m ³ , only historic data on actual wastewater discharge levels by this customer group
Industrial wastewater discharge variation	%, for all years, estimated percentage change (increase/decrease) in wastewater discharge volumes by this consumer group
Budgetary organisations wastewater discharge variation	%, for all years, estimated percentage change (increase/decrease) in wastewater discharge volumes by this consumer group
Commercial units variation	%, for all years, estimated percentage change (increase/decrease) in wastewater discharge volumes by this consumer group
Water for district heating variation	%, for all years, estimated percentage change (increase/decrease) in wastewater discharge volumes by this consumer group

5.2.5 Technical assumptions

Most of the technical parameters are time dependant and the purpose of this section is for the user to enter such technical assumptions for further use in model calculations. Data requirement in this section is extensive; hence it has been split into sub-group.

Tables below provide overview of the variables required for input in Technical assumptions section for some sub-group of required data. Data requirement and unit measure specification is similar for other sub-groups.

Table 17 Technical assumptions, Water and wastewater consumption assumptions

Input parameter	Unit measure
Own consumption of water	% of water for distribution, amount of water used for Water Utility needs
Water purchased	000 m ³ , volume of water purchased from outside provider
Net infiltration	% of wastewater for treatment, net calculation of infiltration waters into sewage system
Wastewater outsourced for treatment	000 m ³ , volume of wastewater outsource for treatment

Table 18 *Technical assumptions, Electricity consumption assumptions*

Input parameter	Unit measure
Total electricity consumption	000' kWh/year, historical energy consumption data annual
Portion of total electricity consumption used for water supply	%, which share of total energy consumption was used for water needs
Variation in amount of electricity consumed per m ³ of water	%, estimated change in the amount of energy consumed per m ³ of water produced
Variation in amount of electricity consumed per m ³ of wastewater	%, estimated change in the amount of energy consumed per m ³ of wastewater treated
Electricity consumption for own needs	000' KWh/year, own energy consumption
Expected increase/decrease in electricity consumption for own needs	%, percentage change in own energy consumption for future years
Electricity price	LCU/KWh, current and estimated electricity price per KWh
Electricity price variations (apart from indexation)	% annual, expected changes in price of electricity

Table 19 *Technical assumptions, Fuel consumption assumptions*

Input parameter	Unit measure
Total fuel gas consumption	m ³ /year, total fuel consumption in historical periods
Unit water fuel gas consumption variation	%, estimated percentage changes in the unit fuel consumption
Share of total fuel gas consumption to water	%, percentage of fuel spend for water needs
Fuel gas price	LCU/m ³ , price of the fuel gas for all years
Fuel gas price variations (apart from indexation)	% annual, estimated increase or decrease in the price of the fuel gas

Further sections of technical assumption data entry module require input of:

- Materials or chemicals consumption assumptions
- Spare parts consumption assumptions
- Maintenance consumption assumptions

- Assumptions on unit cost of pipe replacement or new pipe extension works

5.2.6 Fixed assets

In this section user will have to enter historical data on Water Utility assets. The following parameters will be required:

- Period - beginning gross value;
- Investments;
- Disposals;
- Period end - gross value;
- Depreciation;
- Accumulated Depreciation;
- Period end - net book value.

All data input requirement are for historical periods and the following asset category information is required:

- Buildings;
- Constructions;
- Machinery and Equipment;
- Transmission lines/pipes;
- Other.

5.2.7 Human resource development plan

User is asked to indicate for every updating period changes in the number of staff in specific staff categories. The user will have to enter for each year:

- number of newly employed personnel;
- number of personnel lay-off;

Following categories of staff are distinguished:

- Administration and Management;
- Service personnel;

- Workers;
- Auto service personnel.

All entries are in numbers.

5.2.8 Other time dependant data input assumptions

In this section range of other time dependant data not linked to any sub-category is to be entered:

Table below provides overview of the variables required for input in this section of Other assumptions.

Table 20 Other assumptions

Input parameter	Unit measure
PORTION OF THE TARIFF BASE CHARGED TO HOUSEHOLDS, WATER	% of full-cost recovery tariff
PORTION OF THE TARIFF BASE CHARGED TO HOUSEHOLDS, WW	% of full-cost recovery tariff
TOTAL SUM OF PRIVILEGES AND EXEMPTIONS, WATER	000' LCU
TOTAL SUM OF PRIVILEGES AND EXEMPTIONS, WASTEWATER	000' LCU
MARK-UP ON TARIFF, WATER, INDUSTRY	% to non-residential customers
MARK-UP ON TARIFF, WATER, BUDGETARY ORG.	% to non-residential customers
MARK-UP ON TARIFF, WATER, COMMERCIAL UNITS	% to non-residential customers
MARK-UP ON TARIFF, WATER, DISTRICT HEATING	% to non-residential customers
MARK-UP ON TARIFF, WW, INDUSTRY	% to non-residential customers
MARK-UP ON TARIFF, WW, BUDGETARY ORG.	% to non-residential customers
MARK-UP ON TARIFF, WW, COMMERCIAL UNITS	% to non-residential customers
MARK-UP ON TARIFF, WW, DISTRICT HEATING	% to non-residential customers
RESIDENTIAL SECTOR RECEIVABLES	000' LCU
NON-RESIDENTIAL SECTOR RECEIVABLES	000' LCU
BUDGET SECTOR RECEIVABLES	000' LCU
COLLECTION RATIO ASSUMPTION, RESIDENTIAL	% for collection

COLLECTION RATIO ASSUMPTION, NON-RESIDENTIAL	% for collection
RATIO OF PAID IN/COMMITTED SUBSIDIES	% for collection
BAD DEBT PROVISION	% annual billing
MARGIN	% of costs eligible for tariff base
MARGIN FOR HOUESHOLDS	% of full-cost recovery tariff
MARGIN FOR INDUSTRY	% of full-cost recovery tariff
MARGIN FOR BUDGETARY ORGANISATIONS	% of full-cost recovery tariff
MARGIN FOR COMMERCIAL ENTITIES	% of full-cost recovery tariff
MARGIN FOR DISTRICT HEATING PROVIDERS	% of full-cost recovery tariff
EQUITY (share capital+retained earning)	000' LCU

6 Tariff calculation module

The purpose of the FPTWU Tool's spreadsheet titled "Tariff Calculation" is to calculate water and wastewater tariffs for all consumer groups serviced by the Water Utility.

6.1 Methodology

The tariff calculation in this spreadsheet is not static (based on a predefined formula), but rather a dynamic process providing a range of user-defined scenarios:

- The user is able to define which cost components the Water Utility is able/entitled to include in the tariff calculation base.
- It is possible to define individual margins or mark-ups on the calculated tariff level for each customer group.
- All cost components related to Water Utility activities are split into "fixed costs" (independent of the volume of water produced and the volume of the wastewater received for treatment) and "variable costs" (directly linked to the water and wastewater volumes), allowing the user of the FPTWU Tool to calculate and set two-tier tariffs, depending on whether a particular Water Utility wishes to introduce different tariffs.
- An "on-off" switch is provided, which allows the user to switch off model calculations on water and wastewater tariffs and to enter tariff levels for each customer group *manually*. This possibility provides the user with an amount of flexibility in conducting a range of different tariff related scenario analysis, for example, if the user wishes to assess what tariff levels would be required in order to support specific investment programmes.

In developing the "Tariff Calculation" spreadsheets, specific methodological aspects and concepts of tariff settings in EECCA countries has been utilised. In the following section these methodological considerations are briefly described in order to provide the user with a brief background. Thereafter a detailed description of the various spreadsheet functionalities is provided.

6.2 Tariff formulas and structures

6.2.1 Tariff formulas

Municipal utilities providing water, wastewater, heating and other communal services are characterised as local natural monopolies. As such, they pose a dilemma: on one hand their natural monopoly status allows them to exploit cost advantages, on the other, the position of being a sole provider of services gives them the possibility of abusing market power in the form of overstated service prices. Due to this contradiction, municipal utilities were always seen as potential subject for regulation.

In the context of municipal utilities, diverse regulatory forms exist, each related to a specific price formula used to determine user charges:

- cost plus design - allows to recover the costs of operation with a limited profit margin;
- rate of return - modification of the cost plus approach, where limits are imposed on the rate of return on the invested capital;
- price cap - sets a ceiling on the price to be charged to customers and the ceiling is fixed for a specific period of time after which it can be revised;
- yardstick formula - costs allowed to be included into the tariff base are benchmarked on the basis of the costs of peer group of water utilities.

The Cost plus approach is the one most widely used in the EECCA countries. Operators are allowed to recover operational costs with a very limited profit margin - if any. Although relatively simple for all parties involved, the cost plus mechanism has several deficiencies as far as economic efficiency and proper incentives for utility managers is concerned. However, due to its widespread use in the region as well as the limited metering system which restricts the use of other approaches, the cost plus formula has been used as the basis for tariff calculations in the FPTWU Tool.

Most of the tariff formulas applied and the regulatory mechanisms chosen presume the ability of the user to properly assess cost elements. On this basis, the cost recovery of the Water Utility and further/additional user charges will be determined. As practice demonstrates, however, this is not a trivial task. Eligible costs are treated differently in different countries, sometimes reflecting specific regulatory mechanism in place and, frequently, resulting from political pressure applied to achieve low tariffs for consumers. It is, therefore, essential to determine a list of eligible cost elements to be included in the cost calculations for the water utilities. The approach used in this Tool is to provide a certain amount of flexibility and allow the user to define what the appropriate level of cost recovery is in his utility. The FPTWU Tool allows the user to select cost categories from the following categories specified in the model:

- Operating costs including staff and office costs;
- Maintenance costs;
- Depreciation;
- Investment costs;
- Interest payments and other financial costs;
- Profit Margin;

Occasionally, profit margins could be generated by increasing tariffs for specific customer groups. The Tool allows for this flexibility, namely in selecting individual margins for each customer group.

6.2.2 Tariff structures

The main types of tariff designs can be classified into following categories:

- uniform tariff scheme;
- two-part tariff scheme;
- progressive and regressive block tariff system.

Under a **uniform tariff** all groups of customers are charged the same unit price for services provided. Unit price determination in this case is frequently based, not only on existing capacities and actual consumption, but also on planned sales and production costs. A system, based on normative consumption indicators was, and still is, commonly utilised in many EECCA countries. The clear disadvantage of uniform tariff based on norms is that it provides no incentive for these customers to a more rational use of resources. The primary reason for using this scheme, however, is usually insufficient metering and accounting for actual consumption patterns.

A more progressive **two-part tariff scheme** includes typically a "fixed" charge and a "variable" charge component. The "fixed" component is intended to recover expenses such as customer service, billing and collection, debt service, fractions of capital costs, operating/administrative expenses. This charge is set as equal for all customers and does not depend on the actual consumption of services. The "variable" charge is directly linked to the amount of services consumed and has several benefits. The most important benefit is that it provides the consumer with an incentive for rationing water consumption. In addition, the variable component allows accounting for the seasonal variation in consumption patterns and excess consumption during so called peak times. But, of course, a two-part system requires that an effective metering system is in place. This type of tariff setting is not used in EECCA countries, although some water utilities are experimenting with its introduction.

Finally, the **block tariff scheme** defines rates for specific amounts of services provided (blocks of services). Thereafter, each consequent block of services (for example a specific amount of water consumed) can be charged a higher (progressive) or a lower (regressive) rate. Block tariffs are effective where there are significantly different consumption patterns between consumer groups. Such pricing arrangement is basically a modification of volumetric charges of

the two-part tariff system and has the advantage of inducing incentives for resource conservation (rational consumption). This type of tariff setting is not used in EECCA countries.

The FPTWU Tool primarily works with the volumetric tariff. However, in the "Tariff Calculation" spreadsheet a split between fixed and variable costs is provided and the two-tier tariff structure is calculated per household or non-household connection.

6.3 Data input for "Tariff Calculation" spreadsheet

Data input requirements for this spreadsheet are rather limited as the tariffs are calculated based on the Water Utility costs and water demand and wastewater discharge data derived within the model. However, there is still certain amount of data which needs to be entered by the user. Such data can be split into data entered in the "Input-TI" and "Input-TD" spreadsheets and data entered directly in "Tariff Calculation" spreadsheet. The following tables present a list of this data and its specifications.

6.3.1 Tariff calculation data input in "Input-TI" and "Input-TD"

The data required for the tariff calculation needs to be entered in the spreadsheets "Input-TI" and "Input-TD" and is shown in Table 21.

Table 21 Data input required for tariff calculation in "Input-TI" and "Input-TD"

Input Variable	Spreadsheet	Units	Purpose
PORTION OF THE TARIFF BASE CHARGED TO HOUSEHOLDS, WATER and WASTEWATER	Input - TD	% of full-cost recovery tariff	Specifies the portion of the calculated tariff that is allowed to be charged to households.
MARK-UP ON TARIFF, WATER FOR EACH CUSTOMER GROUP	Input - TD	% to non-residential customers	Specifies any mark-up on top of the calculated water tariff to be charged to specific customer group. This mark-up is charged in excess of the existing utility profit margin for a given customer group. Can be left as "0" if no such mark-up is necessary or allowed in the given Water Utility.
MARK-UP ON TARIFF, WASTEWATER FOR EACH CUSTOMER GROUP	Input - TD	% to non-residential customers	Specifies any mark-up on top of the calculated wastewater tariff to be charged to specific customer group. This mark-up is charged in excess of the existing utility profit margin for given customer group. Can be left as "0" if no such mark-up is necessary or allowed in the given utility.
MARGIN ON TARIFF, WATER FOR EACH CUSTOMER	Input - TD	% to non-residential customers	Specifies profit margin on top of the calculated water tariff to be charged to specific customer group. This mark-up is charged in excess of the existing utility profit margin for given customer group. Can be left as "0" if no such

GROUP			mark-up is necessary or allowed in the given utility.
MARK-UP ON TARIFF, WASTEWATER	Input - TD	% to non-residential customers	Specifies profit margin on top of the calculated wastewater tariff to be charged to specific customer group. This mark-up is charged in excess of the existing utility profit margin for given customer group. Can be left as "0" if no such mark-up is necessary or allowed in the given utility.

6.3.2 Tariff calculation data input in the "Tariff Calculation" spreadsheet

The data required for the tariff calculation needs to be entered in the spreadsheet "Tariff Calculation" and is shown in Table 22.

Table 22 Data input required for tariff calculation in "Tariff Calculation" spreadsheet

Input Variable	Spreadsheet	Units	Purpose
MANUAL WATER TARIFF ENTRY (selection and tariff levels for each customer group)	Tariff Calculation	YES=1, NO=0 LCU/m3	By selecting YES=1, NO=0 model tariff calculation are disabled and the user enters his own tariff levels for each customer group Tariff levels are entered in specified unit of LCU/m3
MANUAL WASTEWATER TARIFF ENTRY (selection and tariff levels for each customer group)	Tariff Calculation	YES=1, NO=0 LCU/m3	By selecting YES=1, NO=0 model tariff calculation are disabled and the user enters his own tariff levels for each customer group Tariff levels are entered in specified unit of LCU/m3
WATER COST CATEGORY SELECTOR FOR INCLUSION INTO TARIFF BASE	Tariff Calculation	YES=1, NO=0	By selecting YES=1 the user specifies that this cost category will be included into water tariff base (will be recovered through water tariff). By selecting NO=0 the user specifies that this cost category will not be included.
WASTEWATER COST CATEGORY SELECTOR FOR INCLUSION INTO TARIFF BASE	Tariff Calculation	YES=1, NO=0	By selecting YES=1 the user specifies that this cost category will be included into wastewater tariff base (will be recovered through wastewater tariff). By selecting NO=0 the user specifies that this cost category will not be included.

6.4 How the tariff calculation module works

In order to facilitate the work with the "Tariff Calculation" spreadsheet it is important to understand the underlying logic of the calculations:

- The spreadsheet aggregates the cost components separately for water and wastewater with a simultaneous split between **fixed costs** (independent of the water production or the wastewater received for treatment) and **variable costs** (directly dependent on water and wastewater volumes). The sample spreadsheet is shown in Figure 30 below.

Figure 30 Cost components are split between fixed and variable

FINANCIAL PLANNING TOOL						
Back						
TARIFF CALCULATION			31-12-2004 Historical	31-12-2005 Historical	31-12-2006 Historical	31-12-2007 Forecast
TOTAL WASTEWATER	000' LCU		293.580	163.324	328.066	345.543
WATER						
Electricity Cost						
Fixed	000' LCU		1.825	1.802	1.778	1.980
Variable	000' LCU		57.466	56.608	54.359	57.541
Gas Cost						
Variable	000' LCU		5.759	7.585	12.130	11.646
Fuel Cost						
Variable	000' LCU		13.207	14.090	18.414	17.679
Spare parts						
Fixed	000' LCU		1.930	2.634	2.143	2.250
Chemicals and other material for water treatment costs						
Variable	000' LCU		1.850	2.104	3.006	3.022
Cost of purchased water						
Variable	000' LCU		-	-	-	-
Maintenance cost						
Fixed	000' LCU		203.475	217.880	231.593	244.909
Other costs						
Fixed	000' LCU		-	-	-	-
Variable	000' LCU		-	-	-	-
Staff Costs						
Fixed	000' LCU		41.664	41.664	41.664	43.955
Office Costs						
Fixed	000' LCU		2.083	2.083	2.083	2.198

- Each of the cost components is then aggregated for potential inclusion into the tariff calculation base (see Figure 31). This procedure is the most common practise in the EECCA countries. As already mentioned earlier the following cost categories are distinguished:
 - Operating costs including staff and office costs;
 - Maintenance costs;
 - Depreciation;
 - Investment costs;
 - Interest payments and other financial costs;
 - Margin.

Figure 31 Costs categories for inclusion into tariff base

FINANCIAL PLANNING TOOL				
Back				
TARIFF CALCULATION			31/03/2005 Historical	30/06/2005 Historical
WATER RELATED COSTS				
Electricity Cost	000' LCU		219,364	187,101
Fuel Cost	000' LCU		126,401	126,401
Spare parts	000' LCU		500	500
Chemicals and other material for water treatment costs	000' LCU		2,999	2,999
Cost of purchased water	000' LCU		18,153	18,153
Maintenance cost	000' LCU		42,959	42,959
Other costs	000' LCU		91,194	91,194
Staff Costs	000' LCU		291,944	291,944
Office Costs	000' LCU		29,194	29,194
TOTAL	000' LCU		822,708	790,446
WASTEWATER RELATED COSTS				
Electricity Cost	000' LCU		32,778	27,958
Fuel Cost	000' LCU		18,888	18,888
Spare parts	000' LCU		500	500
Chemicals and other material for wastewater treatment costs	000' LCU		1,498	1,498
Wastewater treatment outsourcing	000' LCU		-	-
Maintenance costs	000' LCU		6,419	6,419
Other costs	000' LCU		13,627	13,627
Staff Costs	000' LCU		32,438	32,438
Office Costs	000' LCU		3,244	3,244
TOTAL	000' LCU		109,392	104,571

- In the next step the user will have to define which of the cost categories are to be included in the tariff calculation (see Figure 32). This is done by using selection options which are marked in yellow near each of the cost categories, independently for water and wastewater. This procedure basically ensures that the user can replicate the local regulation on cost recovery levels, while still having the flexibility to analyse other scenarios on future developments.

Figure 32 Selection of cost categories to be included into tariff base

FINANCIAL PLANNING TOOL				
Back				
TARIFF CALCULATION			31/03/2005 Historical	30/06/2005 Historical
WATER - selection of costs to be included into tariff base - SELECT "1" IF THE COST COMPONENT IS ALLOWED TO BE INCLUDED INTO TARIFF CALCULATIONS				
Operating costs including staff and office costs	YES=1, NO=0	1		
Maintenance costs	YES=1, NO=0	1		
Depreciation	YES=1, NO=0	1		
Investment cost	YES=1, NO=0	0		
Interest payments and other financial costs	YES=1, NO=0	0		
Margin	YES=1, NO=0	0		
WASTEWATER - selection of costs to be included into tariff base - SELECT "1" IF THE COST COMPONENT IS ALLOWED TO BE INCLUDED INTO TARIFF CALCULATIONS				
Operating costs including staff and office costs	YES=1, NO=0	1		
Maintenance costs	YES=1, NO=0	1		
Depreciation	YES=1, NO=0	1		
Investment cost	YES=1, NO=0	0		
Interest payments and other financial costs	YES=1, NO=0	0		
Margin	YES=1, NO=0	0		

- On the basis of specified cost categories the FPTWU Tool then calculates the tariffs for water and wastewater separately for each customer/consumer groups. This is done for both including and excluding the VAT as shown on Figure 33.

Figure 33 Model calculates tariff for each customer group and separately for water and wastewater

FINANCIAL PLANNING TOOL				
Back				
TARIFF CALCULATION			31/03/2005	30/06/2005
			Historical	Historical
MANUAL WATER TARIFF ENTRY - DISTRICT HEATING		YES=1, NO=	0	20.00
MODEL CALCULATED TARIFFS				
<i>Tariffs shown below are calculated automatically by the Tool using cost-recovery assumptions</i>				
Total water billed		000 m3	11,331	11,331
Total water costs for tariff calculation		000 LCU	1,331,048	1,298,785
Full-cost recovery+margin water tariff		LCU/m3	117.47	114.63
Full-cost recovery+margin water tariff or margin for Households		LCU/m3	117.47	114.63
Full-cost recovery+margin water tariff or margin for Industry		LCU/m3	117.47	114.63
Full-cost recovery+margin water tariff or margin for Budgetary organisations		LCU/m3	117.47	114.63
Full-cost recovery+margin water tariff or margin for Commerce		LCU/m3	117.47	114.63
Full-cost recovery+margin water tariff or margin for District heating		LCU/m3	117.47	114.63
Full-cost recovery+margin+VAT water tariff		LCU/m3	140.97	137.55
Full-cost recovery+margin water tariff or margin for Households+VAT		LCU/m3	140.97	137.55
Full-cost recovery+margin water tariff or margin for Industry+VAT		LCU/m3	140.97	137.55
Full-cost recovery+margin water tariff or margin for Budgetary organisations+VAT		LCU/m3	140.97	137.55
Full-cost recovery+margin water tariff or margin for Commerce+VAT		LCU/m3	140.97	137.55
Full-cost recovery+margin water tariff or margin for District heating+VAT		LCU/m3	140.97	137.55
Total wastewater billed			4,856	4,856
Total wastewater costs for tariff calculation			165,874	161,053
Full-cost recovery+margin wastewater tariff		LCU/m3	34.16	33.16
Full-cost recovery+margin wastewater tariff or margin for Households		LCU/m3	34.16	33.16
Full-cost recovery+margin wastewater tariff or margin for Industry		LCU/m3	34.16	33.16
Full-cost recovery+margin wastewater tariff or margin for Budgetary organisations		LCU/m3	34.16	33.16
Full-cost recovery+margin wastewater tariff or margin for Commerce		LCU/m3	34.16	33.16
Full-cost recovery+margin wastewater tariff or margin for District heating		LCU/m3	34.16	33.16

5. If the user wishes to analyse different tariff levels and their impact on the financial standing of the Water Utility. The tariffs manual entry section of the spreadsheet can be used. The user needs to select YES=1 or NO=0, indicating whether the user would like to enter tariff data manually or not (see Figure 34). If the model calculation is disabled the user will have to enter tariff data into the yellow marked cells. This data will then be used in all subsequent model calculations.

Figure 34 Manual tariff entry section of tariff calculation spreadsheet

FINANCIAL PLANNING TOOL				
Back				
TARIFF CALCULATION			31/03/2005	30/06/2005
			Historical	Historical
MANUAL TARIFF ENTRY MODULE				
SELECT "1" IF YOU WANT TO INPUT WATER AND WASTEWATER TARIFF LEVELS YOURSELF (please note model calculated tariffs will be ignored)				
MANUAL WATER TARIFF ENTRY	YES=1, NO=	0	96.00	96.00
MANUAL WATER TARIFF ENTRY - HOUSEHOLDS	YES=1, NO=	0	96.00	96.00
MANUAL WATER TARIFF ENTRY - INDUSTRY	YES=1, NO=	0	96.00	96.00
MANUAL WATER TARIFF ENTRY - BUDGETARY ORGANISATIONS	YES=1, NO=	0	96.00	96.00
MANUAL WATER TARIFF ENTRY - COMMERCIAL ENTITIES	YES=1, NO=	0	96.00	96.00
MANUAL WATER TARIFF ENTRY - DISTRICT HEATING	YES=1, NO=	0	96.00	96.00
MANUAL WASTEWATER TARIFF ENTRY	YES=1, NO=	0	20.00	20.00
MANUAL WATER TARIFF ENTRY - HOUSEHOLDS	YES=1, NO=	0	20.00	20.00
MANUAL WATER TARIFF ENTRY - INDUSTRY	YES=1, NO=	0	20.00	20.00
MANUAL WATER TARIFF ENTRY - BUDGETARY ORGANISATIONS	YES=1, NO=	0	20.00	20.00
MANUAL WATER TARIFF ENTRY - COMMERCIAL ENTITIES	YES=1, NO=	0	20.00	20.00
MANUAL WATER TARIFF ENTRY - DISTRICT HEATING	YES=1, NO=	0	20.00	20.00

6.5 Calculation of the applicable tariff by customer groups

As already stated in the above sections, the tariff calculation procedures are almost entirely automated and calculated by the model. Hence the concrete procedure for working with this module is relatively simple and can be guided as follows:

1. By using the cost category selector the user defines which cost items are to be included into the tariff base (recovered through tariffs).
2. The model will then calculate the tariff for each customer group and use these tariffs in the further model calculations.
3. If the user wishes to use specific tariff levels, select "1" in the manual tariff selection section and input tariff levels in the appropriate yellow cells as shown in the specific Table 21 and Table 22.
4. If the user wishes to add an additional profit margin or an additional tariff mark-up on top of the calculated tariff the user can use the data input entries in the spreadsheets "Input-TI" and "Input-TD" and enter margin and mark-up data in the format specified in tables Table 21 and Table 22.

6.6 Two-tier tariff calculation

The FPTWU Tool works primarily with volumetric tariffs. However, in the "Tariff Calculation" spreadsheet a split between fixed and variable costs is provided. Based on this split the two-tier tariff structure is calculated per household or non-household connection.

The calculation is fully automated, so that no additional input is required from the user. However, due to the lack of meters in the region, the information needed for optimal use of the tariff calculation spreadsheet is limited. Hence, while the user could review a potential two-tier tariff in the model, it is not utilised in the FPTWU Tool for development of diverse scenarios.

Figure 35 Calculation of two-part tariff

FINANCIAL PLANNING TOOL				
Back				
TARIFF CALCULATION			31/03/2005 Historical	30/06/2005 Historical
CALCULATION OF THE TWO PART TARIFFS				
Total fixed water related cost	000' LCU		418,608	416,341
Total variable water related cost	000' LCU		404,100	374,104
Total fixed wastewater related cost	000' LCU		52,170	51,831
Total variable wastewater related cost	000' LCU		58,720	54,238
Allocation of fixed water costs between customer groups				
Households	000' LCU		363,598	361,629
Industry	000' LCU		35,393	35,201
Budget organisations	000' LCU		19,618	19,511
Commercial entities	000' LCU		-	-
District heat providers	000' LCU		-	-
Allocation of fixed wastewater costs between customer groups				
Households	000' LCU		39,203	38,949
Industry	000' LCU		7,445	7,396
Budget organisations	000' LCU		5,522	5,486
Commercial entities	000' LCU		-	-
District heat providers	000' LCU		-	-

7 Capital expenditure programme

The capital expenditure programme module allows the user to analyse different aspects related to the implementation of investment projects in the Water Utility. It consists of four separate spreadsheets and provides the following main functionalities:

- Selection of the specific investment projects separately for water related activities and wastewater related activities from the list of pre-defined investment projects to be implemented or, in other words, to be assessed using the FPTWU Tool;
- Input of the selected project investment costs and the flexibility to spread such costs over a number of years to be decided by the user;
- Allocation of investment costs between different financing sources;
- Calculation of the fixed asset additions as a result of new investments;
- Definition of own investment project, not included into a pre-defined list of projects, and identification of all related costs and benefits; and the
- Calculation of the effects of all selected investment projects on the Water Utility's technical, operational, and financial standing.

7.1 Structure of the Capital Investment Programme (CIP) module

The CIP module consists of four separate spreadsheets linked to each other to form an investment selection and calculation module. Those spreadsheets are:

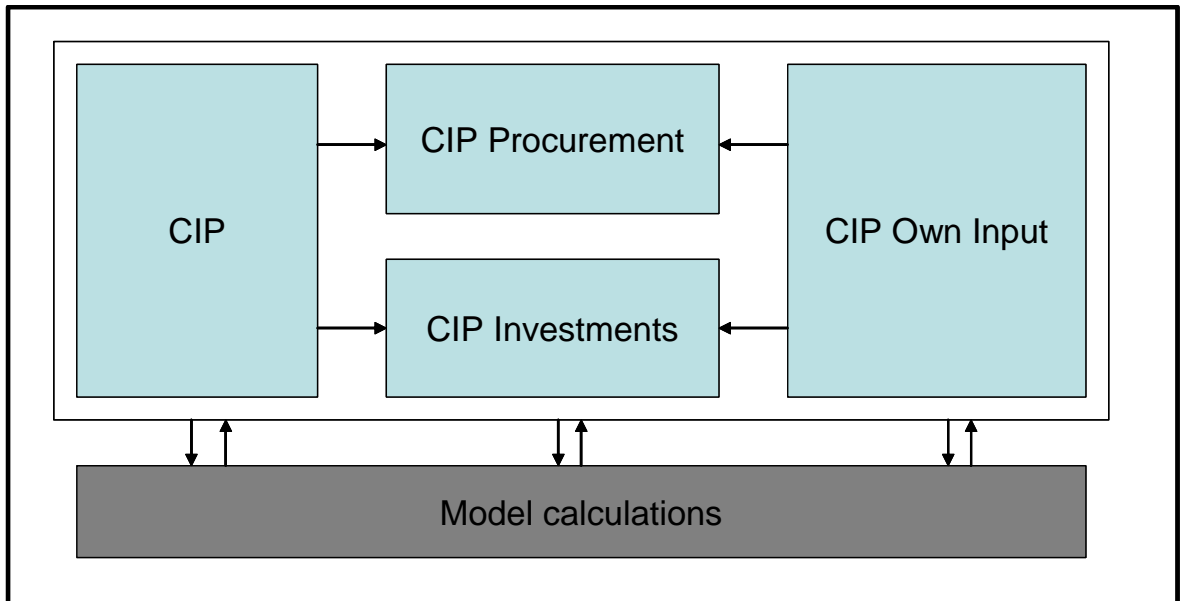
- Capital Investment Programme (CIP) – spreadsheet where projects are selected, project effect parameters are specified, and the total investment cost for each project are entered across a number of years.
- CIP Procurement – spreadsheet where the user has the possibility to define the sources to finance the investment costs.

- CIP Investments – spreadsheet that calculates, on the basis of data inputted in the previous two spreadsheets, the fixed asset implications of new investments.
- CIP Own Input – this is the spreadsheet where the user has the possibility to define his own projects. Such projects can be those that have to be carried out as mandatory investments as well as those projects that are not included in the list of pre-defined projects in the CIP spreadsheet.

The logical structure of how the module works are presented in *Figure 36*. It shows the main calculation flow and it indicates the sequence of the user activities:

1. "CIP" and "CIP Own input" are used to select the relevant projects, input cost of the projects, and to define the project effect parameters;
2. On the basis of the relevant input data, the "CIP Procurement" aggregates the total costs of all selected investment projects and the user allocates those costs among different financing sources;
3. Also using the data entered in the "CIP" and the "CIP Own input", the spreadsheet "CIP Investments" calculates all fixed asset additions and related depreciations;
4. On the basis of the above inputted data, calculations are carried out in the model including additional investment costs, operational savings, implications for financing, borrowing, etc.;
5. Such model calculations are reflected in the overall standing of the Water Utility and is summarised in an aggregated form in the "Financial Gap" spreadsheet. On this basis the user can view the effects of the investments and go back to the CIP module to make corresponding revisions in an iterative process.

Figure 36 Logical structure of the CIP module



7.2 Selection of the investment projects

In the spreadsheet “CIP” a pre-defined list of requirements for water and wastewater projects are presented. The user is able to use selection options and decide whether to include a specific project for implementation at the Water Utility or not. The following water investment projects are pre-defined in the “CIP” spreadsheet:

Table 23 List of pre-defined water investment projects

Project identifier	Project name
CIP W1	Leak detection and repair activities
CIP W2	Water pipe replacement work
CIP W3.1 and W3.2	New/Rehabilitation of water treatment plant - plant and construction works as separate investments
CIP W4.1 and W4.2	New/Rehabilitation of pumping equipment for pressure zones - pumps and construction works as separate investments
CIP W5.1	New/Rehabilitation of submersible pumps
CIP W6.1 and W6.2	New boreholes well-field and new surface water resources
CIP W7	New reservoir
CIP W8	Water network extension
CIP W9	Household metering
CIP W10	Metering of water abstraction

The following wastewater investment projects are pre-defined in the “CIP” spreadsheet:

Table 24 List of pre-defined wastewater investment projects

Project identifier	Project name
CIP WW1	Rehabilitation of wastewater treatment plant
CIP WW2	Rehabilitation of wastewater main pumping station
CIP WW3	Replacement of pumps
CIP WW4	Replacement of gravity collectors
CIP WW5	Wastewater pipes replacement
CIP WW6	Wastewater network extension

The user has the choice to include or not to include a specific project by selecting “YES” or “NO” in the list of the projects.

If the project is selected, the user will then need to enter, in the same “CIP” spreadsheet, the costs following/allocated to the implementation of the project.

In addition, the user will need to specify unit savings or unit additional operating costs which arise from implementation of the project.

7.3 Data input for investment projects

Data in the CIP module is entered into three spreadsheets – “CIP”, “CIP Procurement”, and “CIP Own Input”. All data is separated into categories, one category includes data input common to each project while another category include data input specific to a particular project, if selected. Below, all input parameters in the CIP module are listed with explanation of their purpose and format. It must be noted again that input variables are the “yellow” marked cells. All the other cells do not require user input and are model automatic calculations.

7.3.1 Common CIP data input

Data input which is common to all projects is listed in Table 25 below.

Table 25 Data input common to all investment projects

Input Variable	Spreadsheet	Units	Purpose
Project selection	CIP	YES=1, NO=0	YES=1 includes the project into model calculations NO=0 does not include the project into model calculations
Investment costs	CIP	000' LCU	After selection of the project the estimated investment cost is entered the model for the relevant number of years
Project financing source selection	CIP Procurement	YES=1, NO=0	YES=1 selects particular financing source to finance cost of investment NO=0 does not selects particular financing source to finance cost of investment
Project financing source share	CIP Procurement	%	Specifies which % of the total investment cost is to be financed from the given source
Selection of project not included in pre-defined list	CIP Own input	INCLUDE=1 DO NOT INCLUDE=0	INCLUDE=1 includes project into model calculations DO NOT INCLUDE=0 does not include project into model calculations
Estimated investment value	CIP Own input	000' LCU	For selected projects not included in pre-defined list, the user enters cost of this project spread across number of years
Estimated benefits	CIP Own	000' LCU	For selected projects not included in pre-

	input		defined list, the user enters estimated project benefit for each of the category: Energy costs Staff costs Material/chemical costs Fuel Spare parts
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7.3.2 Water related investment projects data input

Data input specific to each of the pre-defined water investment projects is presented in the tables Table 26-Table 30 below.

Table 26 Data input requirement for investment project CIP W1

CIP W1 Leak detection and repair activities			
Input Variable	Spreadsheet	Units	Purpose
Annual reduction in leakage	CIP	%	Specifies estimated annual % reduction of the water losses as a result of project implementation. Water losses reduction is calculated as percentage from the previous years total water loss.

Table 27 Data input requirement for investment project CIP W2

CIP W2 Water pipe replacement work			
Input Variable	Spreadsheet	Units	Purpose
Planned replacement of water pipes	CIP	% of existing network/annual	When the user selects project for water pipe replacement, the user will need to also specify which percentage of old water network the user is planning to replace in the current year. And, since the model is built on a annual basis, the user is asked to enter his annual estimate on a annual basis.

Table 28 Data input requirement for investment project CIP W3-CIP W7

CIP W3.1-3.2 New/Rehabilitation of water treatment plant - plant and construction
CIP W4.1-4.2 New/Rehabilitation of pumping equipment for pressure zones
CIP W5.1 New/Rehabilitation of submersible pumps
CIP W6-1-6.2 New boreholes well-field
CIP W7 New reservoir

Input Variable	Spreadsheet	Units	Purpose
Annual change in energy consumption	CIP	% of current unit/m3 per 1million of LCU	<p>By entering this parameter the user specifies the percentage increase (with "+") or decrease (with "-") in the unit energy consumption per m3 of water as specified in the "Costs" spreadsheet.</p> <p>It is important to note that the percentage is per 1 million of investment amount. Hence, if the user revises the amount of investment for a current project, the user also needs to re-calculate this % per 1 million of new investment amount.</p>
Administration and Management (addition, reduction)	CIP	Number	<p>It specifies how many new people will need to be employed or reduced as a result of the project implementation.</p> <p>After inputting these parameters the model calculates the net change in the staff category and correspondingly adjusts the costs.</p>
Service personnel (addition, reduction)	CIP	Number	<p>It specifies how many new people will need to be employed or reduced as a result of the project implementation.</p> <p>After inputting these parameters the model calculates the net change in the staff category and correspondingly adjusts the costs.</p>
Workers (addition, reduction)	CIP	Number	<p>It specifies how many new people will need to be employed or reduced as a result of the project implementation.</p> <p>After inputting these parameters the model calculates the net change in the staff category and correspondingly adjusts the costs.</p>
Annual change in fuel consumption	CIP	% of current unit/m3 per 1million of LCU	<p>By entering these parameters the user specifies the percentage increase (with "+") or decrease (with "-") in the unit fuel consumption per m³ of water as specified in the "Costs" spreadsheet.</p> <p>It is important to note that the percentage is per 1 million of investment amount. Hence, if the user revises the amount of investment for the current project, the user also needs to re-calculate this % per 1 million of new investment amount.</p>
Annual change in maintenance cost	CIP	% of current annual cost per 1 million of LCU	<p>By entering this parameter the user specifies the percentage increase (with "+") or decrease (with "-") in the maintenance costs as specified in the "Costs" spreadsheet.</p> <p>It is important to note that the percentage is per 1 million of investment amount. Hence, if the user revises the amount of investment for the current project, the user also needs to re-calculate this % per 1 million of new investment amount.</p>
Annual unit change in material/chemicals	CIP	% of current unit cost/m3 per 1million of LCU	<p>By entering this parameter the user specifies the percentage increase (with "+") or decrease</p>

consumption			<p>(with “-”) in the unit chemical and other material consumption per m³ of water as specified in the “Costs” spreadsheet.</p> <p>It is important to note that the percentage is per 1 million of investment amount. Hence, if the user revises the amount of investment for the current project, the user also needs to recalculate this % per 1 million of new investment amount.</p>
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Table 29 Data input requirement for investment project CIP W8

CIP W8 Water network extension			
Input Variable	Spreadsheet	Units	Purpose
Annual increase in connection rate - water	CIP	% change in number of connected households	<p>The user specifies the estimated annual % change in the number of households connected to the water supply network as a result of the network extension investment project.</p> <p>Separate percentage changes are entered for multi-storey building and for private housing sector.</p> <p>On the basis of inputted annual data, the model recalculates it into annual data and uses them in the water demand forecast part of the model.</p>
Service extension - new water pipes	CIP	km	<p>The user enters how many km of water network the user is planning to replace</p> <p>Data are entered on a annual basis</p>

Table 30 Data input requirement for investment project CIP W9-10

CIP W9 Household metering			
Input Variable	Spreadsheet	Units	Purpose
Households metering and water abstraction metering	CIP	number	<p>The user specifies the estimated number of additional households metered as a result of the investment spending.</p> <p>The user specifies the additional number of meters installed at abstraction facilities.</p> <p>Separate percentage changes are entered for multi-storey buildings and for the private housing sector.</p> <p>Data are entered on a annual basis</p>

7.3.3 Wastewater related investment projects data input

Data input specific to each of the pre-defined wastewater investment projects is presented in Table 31- Table 33.

Table 31 Data input requirement for investment project CIP WW1-CIP W W4

Input Variable	Spreadsheet	Units	Purpose
CIP WW1 New/Rehabilitation of wastewater treatment plant CIP WW2 New/Rehabilitation of wastewater main pumping station CIP WW3 New/Replacement of pumps CIP WW4 New/Replacement of gravity collectors			
Annual change in energy consumption	CIP	% of current unit/m ³ per 1 million of LCU	By entering this parameter the user specifies the percentage increase (with "+") or decrease (with "-") in the unit energy consumption per m ³ of wastewater as specified in the "Costs" spreadsheet. It is important to note that the percentage is per 1 million of investment amount. Hence, if the user revises the amount of investment for the current project, the user also needs to recalculate this % per 1 million of new investment amount.
Administration and Management (addition, reduction)	CIP	Number	It specifies how many new people will need to be employed or reduced as a result of the project implementation. After inputting these parameters the model calculates the net change in the staff category and correspondingly adjusts the costs.
Service personnel (addition, reduction)	CIP	Number	It specifies how many new people will need to be employed or reduced as a result of the project implementation. After inputting these parameters the model calculates the net change in the staff category and correspondingly adjusts the costs.
Workers (addition, reduction)	CIP	Number	It specifies how many new people will need to be employed or reduced as a result of the project implementation. After inputting these parameters the model calculates the net change in the staff category and correspondingly adjusts the costs.
Annual change in fuel consumption	CIP	% of current unit/m ³ per 1 million of LCU	By entering this parameter the user specifies the percentage increase (with "+") or decrease (with "-") in the unit fuel consumption per m ³ of wastewater as specified in the "Costs" spreadsheet. It is important to note that the percentage is per 1 million of investment amount. Hence, if the user revises the amount of investment for the current project, the user also needs to recalculate this % per 1 million of new invest-

			ment amount.
Annual change in maintenance cost	CIP	% of current annual cost per 1 million of LCU	<p>By entering this parameter the user specifies the percentage increase (with "+") or decrease (with "-") in the maintenance costs as specified in the "Costs" spreadsheet.</p> <p>It is important to note that the percentage is per 1 million of investment amount. Hence, if the user revises the amount of investment for current project, the user also needs to re-calculate this % per 1 million of new investment amount.</p>
Annual unit change in material/chemicals consumption	CIP	% of current unit cost/m ³ per 1million of LCU	<p>By entering this parameter the user specifies the percentage increase (with "+") or decrease (with "-") in the unit chemical and other material consumption per m³ of wastewater as specified in the "Costs" spreadsheet.</p> <p>It is important to note that the percentage is per 1 million of investment amount. Hence, if the user revises the amount of investment for the current project, the user also needs to re-calculate this % per 1 million of new investment amount.</p>

Table 32 Data input requirement for investment project CIP WW5

CIP WW5 Wastewater pipes replacement			
Input Variable	Spreadsheet	Units	Purpose
Planned replacement of wastewater pipes	CIP	% of existing network/annual	<p>When the user selects project for wastewater pipe replacement, the user will need to specify which percentage of the old wastewater network the user is planning to replace in the current year.</p> <p>And, since the model is built on a annual basis, the user is asked to enter annual estimates on a annual basis.</p>

Table 33 Data input requirement for investment project CIP WW6

CIP WW6 Wastewater network extension			
Input Variable	Spreadsheet	Units	Purpose
Annual increase in connection rate - wastewater	CIP	% change in number of connected households	<p>The user specifies the estimated annual % change in the number of households connected to the wastewater supply network as a result of network extension investment project.</p> <p>Separate percentage changes are entered for multi-storey buildings and for the private housing sector.</p> <p>On the basis of the inputted annual data, the model recalculates it into annual data and uses them in the wastewater discharged forecast part of the model.</p>
Service extension - new wastewater pipes	CIP	km	<p>The user enters how many km of wastewater network the user is planning to replace</p> <p>Data are entered on a annual basis</p>

7.4 Where to obtain input data for the CIP module

Data for input into CIP module can be broken into two main categories:

- cost of investment;
- parameters reflecting particular investment effect on Water Utility costs.

Investment cost data will have to be estimated by the user on the basis of actual investment volumes to be carried out and using the local prices of the required investment inputs (material, civil works, labour, etc.).

The parameters affecting the Water Utility costs after implementation of the investments will need to be estimated by the user. This involves detailed knowledge of the current operational practices in the utility; hence entering data into the FPTWU Tool will require cooperation between different departments of the Water Utility, coordinated by the immediate Tool user.

It is important to remember that investment costs and the effects of the investment have to be entered into the model in an appropriate unit measures/measurements. The specification of these measures/measurements is stated in the model as well as in Table 25 - Table 33 above.

7.5 How to work with Capital Investment Programme module?

In this section the user will be given a routine guide on the step-by-step procedure on how to work with the CIP Module. By following these steps, the user

will become familiar with the module and will be able to understand the degree of flexibility of the model, specifics of the data entry requirements as well as how and what the FPTWU Tool can calculate is contained in this module.

1. Open the Tool and press the button "Capital investments" on the front page and go to the "CIP" spreadsheet.
2. At the first step the user will need to select which projects and in which sector (water or wastewater) the user is considering analysing. To do that select YES=1 or NO=0 in the yellow marked cells as show on Figure 37.

Figure 37 Project selection in CIP module

FINANCIAL PLANNING TOOL		
Back		
CAPITAL INVESTMENT PLANNING		
INCLUDE CAPITAL INVESTEMENT		
Water		
CIP W1 Leak detection and repair activities	YES=1, NO=0	1
CIP W2 Water pipe replacement work	YES=1, NO=0	0
CIP W3.1 New/Rehabilitation of water treatment plant - water treatment	YES=1, NO=0	1
CIP W3.2 New/Rehabilitation of water treatment plant - new construction	YES=1, NO=0	0
CIP W4.1 New/Rehabilitation of pumping equipment for pressure zones - pumping systems	YES=1, NO=0	1
CIP W4.2 New/Rehabilitation of pumping equipment for pressure zones - new construction	YES=1, NO=0	0
CIP W5.1 New/Rehabilitation of submersible pumps	YES=1, NO=0	1
CIP W6.1 New boreholes well-field	YES=1, NO=0	1
CIP W6.2 New surface water sources	YES=1, NO=0	0
CIP W7 New reservoir MPS	YES=1, NO=0	1
CIP W8 Water network extension	YES=1, NO=0	1
CIP W9 Household metering	YES=1, NO=0	1
CIP W10 Metering of water abstracted	YES=1, NO=0	0
Wastewater		
CIP W/w1 New/Rehabilitation of wastewater treatment plant	YES=1, NO=0	1
CIP W/w2 New/Rehabilitation of wastewater main pumping station	YES=1, NO=0	1
CIP W/w3 New/Replacement of pumps	YES=1, NO=0	1
CIP W/w4 New/Replacement of gravity collectors	YES=1, NO=0	0
CIP W/w5 Wastewater pipes replacement	YES=1, NO=0	1
CIP W/w6 Wastewater network extension	YES=1, NO=0	1

3. Once the user has selected the project, he should locate the section of spreadsheet "CIP" which deals with input data required for selected projects, as shown on Figure 38. The user can do this by using the Project Identifier.

Figure 38 Locate the section in "CIP" spreadsheet with data input cells for the selected project

FINANCIAL PLANNING TOOL			
Back			
CAPITAL INVESTMENT PLANNING		31/03/2006 Forecast	
CIP V3.1 New/Rehabilitation of water treatment plant - water treatment			
Impact of the project			
Annual investment	000' LCU		-
Cumulative investment	000' LCU		-
Annual change in energy consumption	% of current unit/m ³ per 1mln of LCU	0.00%	
Quarterly change in energy consumption	% of current unit/m ³ per 1mln of LCU		0.0%
Annual change in staff cost			
Administration and Management	number		-
addition	number		-
reduction	number		-
Service personnel	number		-
addition	number		-
reduction	number		-
Workers	number		-
addition	number		-
reduction	number		-
Annual change in fuel consumption	% of current unit/m ³ per 1mln of LCU	0.00%	
Quarterly change in fuel consumption	% of current unit/m ³ per 1mln of LCU		0.0%
Annual change in maintenance cost	% of current annual cost per 1 mln of LCU	0.00%	
Quarterly change in maintenance cost	% of current quarterly cost per 1 mln of LCU		0.0%
Annual unit change in material/chemicals consumption	% of current unit cost/m ³ per 1mln of LCU	0.00%	
Quarterly unit change in material/chemicals consumption	% of current unit cost/m ³ per 1mln of LCU		0.0%

4. For the selected project, input data as required (marked yellow) following the data specification in tables Table 25-Table 33.
5. Switch to the spreadsheet "CIP Procurement". The user can see that the selected project investment costs have appeared in this spreadsheet.
6. The user will now need to determine which share of the total investment costs of the project the user wishes to finance from the various sources. The following financing sources can be selected:
 - a. Loans - broken into 2 types in order to provide for the possibility of having two loans with different terms;
 - b. Donor financing - split between donor contribution and budgets of different level contribution;
 - c. Financing by the Water Utility - meaning out of own cash resources.
7. Using YES=1 or NO=0 first decide whether the user want to consider specific source at all. Afterwards input in "%" share of the total investment the user wants to finance from this source as shown on Figure 39.

Figure 39 Select financing source (1 or 0) and input share of costs to be financed

FINANCIAL PLANNING TOOL			
Back			
FINANCING SOURCES			
Project Financing by Loan 1		YES=1, NO=0	Share of costs
WATER		1	100%
WASTEWATER		1	0%
TOTAL LOAN 1			19,053,160.00
Project Financing by Loan 2		YES=1, NO=0	Share of costs
WATER		1	0%
WASTEWATER		1	35%
TOTAL LOAN 2			6,825,357.00

8. Note that the Water Utility investment financing is the residual of all other sources and it is not inputted, but calculated by the model on the basis of inputs from other sources.
9. If the user wants to specify projects other than those on the pre-defined lists, the user needs to switch to the spreadsheet "CIP Own Input" and repeat steps 2-4 of this procedure, namely the user needs to select a project and input data on its costs and effects (additional expenditure or cost savings). Note that the user will have to place this project in the correct asset category in order for the model to properly allocate the "Fixed Costs". When the user select projects from the pre-defined list the user do not need to take care of the asset category as the model does this automatically.
10. Now the user has entered all the required data into the CIP module and the Tool will calculate all implications of the investment project, including the Water Utility's financial standing, operating characteristics, tariffs, etc. The user can view this effect in an aggregated form in the "Financial Gap" spreadsheet.

7.6 Treatment of new fixed assets

As a result of new investments, new assets are added. This procedure is semi-automated in the FPTWU Tool, namely:

- If the project is selected from the list of pre-defined projects, then the new assets are automatically allocated to the specific asset categories, and the new assets and depreciations are properly accounted in the Water Utility total fixed asset calculation in the "Fixed Assets" spreadsheet. No additional data input is required in "CIP Investments" as all the procedures here are automated (see Figure 40).

Figure 40 Model automatically calculates new assets added as a result of investment from pre-defined lists

FINANCIAL PLANNING TOOL										
Back										
FIXED ASSETS			31-12-2004	31-12-2005	31-12-2006	31-12-2007	31-12-2008	31-12-2009	31-12-2010	31-12-2011
			Historical	Historical	Historical	Forecast	Forecast	Forecast	Forecast	Forecast
Period end - net book value	000' LCU		-	-	-	-	-	-	-	-
Asset category 4 - Transmission lines/pipes										
Period - beginning gross value	000' LCU		-	-	-	-	2.330	4.660	6.990	
Investments	000' LCU		-	-	-	2.330	2.330	2.330	2.330	
Disposals	000' LCU		-	-	-	-	-	-	-	
Period end - gross value	000' LCU		-	-	-	2.330	4.660	6.990	9.320	
Depreciation	000' LCU		-	-	-	58	117	175	234	
Accumulated depreciation	000' LCU		-	-	-	58	175	351	585	
Period end - net book value	000' LCU		-	-	-	2.272	4.485	6.639	8.735	
Asset category 5 - Other										
Period - beginning gross value	000' LCU		-	-	-	-	-	-	-	
Investments	000' LCU		-	-	-	-	-	-	-	
Disposals	000' LCU		-	-	-	-	-	-	-	
Period end - gross value	000' LCU		-	-	-	-	-	-	-	
Depreciation	000' LCU		-	-	-	-	-	-	-	
Accumulated depreciation	000' LCU		-	-	-	-	-	-	-	
Period end - net book value	000' LCU		-	-	-	-	-	-	-	
TOTAL FIXED ASSETS - WATER										
Period - beginning gross value	000' LCU		-	-	-	-	2.330	4.660	6.990	
Investments	000' LCU		-	-	-	2.330	2.330	2.330	2.330	
Disposals	000' LCU		-	-	-	-	-	-	-	
Period end - gross value	000' LCU		-	-	-	2.330	4.660	6.990	9.320	
Depreciation	000' LCU		-	-	-	58	117	175	234	
Accumulated depreciation	000' LCU		-	-	-	58	175	351	585	
Period end - net book value	000' LCU		-	-	-	2.272	4.485	6.639	8.735	

- If, however, the investment is defined by the user in the "CIP Own input", then the user must be careful to locate it in a specific asset category in the same spreadsheet. Once this is done, the Tool will then automatically add the new asset to the total asset base of the utility and carry out all other calculations (depreciation, net asset value, etc.) properly.

7.7 Issues to remember when working with the CIP module

It is important to keep the following information in mind when working with CIP module:

- Only enter data in the yellow marked cells.
- When selecting projects the user needs to use "1" or "0" not YES or NO.
- When entering investment costs and unit effects of the investment remember to use the correct sign, as specified in tables Table 25 - Table 33.
- Remember to allocate investment costs between different sources - if the user does not do this the model will automatically allocate all investment costs to be covered from the utility's own resources.
- If the user defines his own project, remember to locate it in the right asset group in the "CIP Own input" spreadsheet.

8 Taxation

The purpose of the taxation module is to calculate taxes and charges payable by the Water Utility. The module calculates taxes on the basis of the specific taxation requirements in the country where Water Utility is located. Such specifics are defined by the user.

8.1 Methodological issues on taxation and accounting- summary

As part of the FPTWU Tool, a development review of taxation and accounting principles in selected EECCA countries has been conducted. This has been done in order to ensure that the Tool is sufficiently flexible and that it can easily be adapted and implemented in other EECCA countries. As a result of the review, it has been concluded that taxation and accounting policies, standards, and practices only differ slightly between the EECCA countries, as all countries have developed their present practices from the same structure and legal background.

Differences in taxation could effect the adoption of the FPTWU Tool in other EECCA countries. Hence, the approach has been to develop the Tool in so that (described in detail below) actual taxes, tax base, and tax rates for calculating the taxes can be adjusted and extended whenever the FPTWU Tool is used. Regarding accounting, while there are certain differences between countries, they do not have any substantial affect on FPTWU Tool analysis, hence the accounting forms and structures used in this version of the FPTWU Tool could also be utilized in other countries and utilities.

8.1.1 Local Taxation - methodological issues

The various taxes paid by the water utilities in the EECCA countries can be divided into two categories:

- Taxes paid based on natural or volumetric basis. These are taxes based on the water extraction amounts, the number of auto transport means, etc.
- Taxes paid based on monetary volumes. These are taxes paid on salary, gross profit of the company, etc.

These categories can be further divided into two groups:

- Fees/charges payable from the operating profit of the company and deducted before taxation;
- Income tax and also taxes/fees payable from the operating profit after tax of the water company (these are typically fines and penalties);

The number/type of particular/specific taxes payable by the water utilities in each of the EECCA countries will differ. One approach could be to automate the calculation of each item in the FPTWU Tool so that a specific tax is derived on the basis of model-predefined formulas. This, however, would make the model unnecessarily complex and, even more importantly, it will not allow for the possibility to account for the dynamics of taxation changes in the Tool.

The approach where user of the model makes the decision on which taxes to include in the model calculations, basis for such taxation calculation, and rates has therefore been adopted. Such methodology provides maximum flexibility in adapting the Tool to local conditions in any EECCA countries. Moreover, it provides possibility to accommodate all possible changes in the future taxation of water utilities in the model.

8.1.2 Local Accounting - methodological issues

Financial accounting is the process of recording, processing and summarizing financial transaction. The primary purpose of the accounting and reporting process is to provide owners, investors and creditors with transparent and unbiased information on the financial situation and performance of communal enterprises.

Prior to the 1990'ies, the economy of EECCA countries was guided/dictated by common legislature of the Soviet Union. The accounting standards for tax collection invariably required little information and managing ability. Thus the main consumer of accounting reports and statements were the tax authorities themselves. Different statistical authorities received specially developed statistical accounting forms.

Since the collapse of the Soviet Union, all independent countries have chosen their own method for developing accounting and taxation policies. However, the majority of the countries developed accounting and taxation rules which follow international principals.

The difference in the accounting mainly falls into the following areas:

- Fixed assets recognition valuation;
- Recognition of the revenue: accrued or cash methods;

- Costs calculation and composition methods could vary from the utility to the utility as well as from the country to the country;
- Creation of the reserves ;
- Accounting of loans and inclusion of interest expenses into the production costs ;

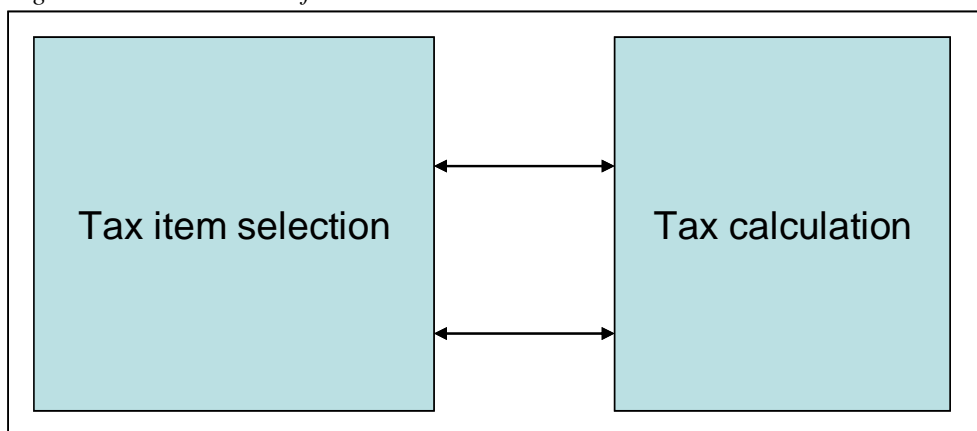
There are numerous differences in the accounting approaches and principles, but they have little influence on the modelling process and development of the FPTWU Tool.

Thus, the difference in accounting policy between the EECCA countries should not be a major challenge when using the Tool, hence, the account formats and structures used in the Tool can be used by any Water Utility in EECCA area.

8.2 Structure of the Taxation module

Taxation module consists of two spreadsheets: "Tax items selection" and "Tax calculation" (Figure 41).

Figure 41 Structure of tax calculation module



"Tax items selection" spreadsheet serves as the primary input spreadsheet for taxation module and is used to define basis for taxation calculation, namely:

- definition and title of the tax and charges to be paid;
- tax or charges basis;
- tax or charges rates;

"Tax calculation" spreadsheet uses the information provided in "Tax items selection" spreadsheet and other parts of the Tool and calculates taxes and charges payable by the company. Calculations in the "Tax calculation" spreadsheet are generated automatically and do not require any data input.

8.3 Data input requirement for Tax module

As already stated the second spreadsheet of the tax module, "Tax calculation" spreadsheet, is automatically generated and does not require any data input.

"Tax items selection" spreadsheet requires limited data input and all the specifications are provided in

Input Variable	Spreadsheet	Units	Purpose
FEES payable from operating profit	Tax items selection	Text	User enters titles of the fees payable from operating profit
TAXES payable from operating profit before tax	Tax items selection	Text	User enters titles of the taxes payable from operating profit before tax
Selection of base for fees and taxes	Tax items selection	YES=1, NO=0	Specifies, for a defined by user fee or tax payable, what is the base from which specific fee or tax will be paid
FEE OR TAX RATE	Tax items selection	% for LCU base 000'LCU/per unit for unit base	After definition of the payable item and specification of the base, this variable determines what is the share of the base to be paid as fee or tax

8.4 Logic and How the Taxation module works

The following step-by-step procedure is set out in order to provide the user with a clear view on how the taxation module works, its logic as well as simply working instructions.

1. "Tax items selection" spreadsheet specifies all possible taxation and other fees/charges information bases, leaving room for additional information to be included (see Figure 42). This it does by linking to a specific place in the model where the appropriate base line is calculated. No action on the part of the user is required in this section of the spreadsheet.

Figure 42 Taxation and fees/charges basis

FINANCIAL PLANNING TOOL				
Back				
TAX and PAYABLE FEES AND CHARGES ITEMS			31/03/2005	30/06/2005
			Historical	Historical
				30/09/2005
				Historical
Basis for the Tax/Fee Calculation				
Profit before Taxes	000' LCU		(121,775)	(118,794)
Sales Revenue, Water, net of VAT	000' LCU		1,366,031	1,332,921
Sales Revenue, Wastewater, net of VAT	000' LCU		174,120	169,059
Sales Revenue, other activity, net of VAT	000' LCU		-	-
Sales Revenue, total, net of VAT	000' LCU		1,540,151	1,501,980
Operational Costs, Water	000' LCU		822,708	790,446
Operational Costs, Wastewater	000' LCU		109,392	104,571
Operational Costs, other activity	000' LCU		-	-
Operational Costs, Total	000' LCU		932,100	895,017
Salary and Wages (salary fund)	000' LCU		324,382	324,382
Net Fixed Assets Value, Water	000' LCU		17,805,922	17,805,922
Net Fixed Assets Value, Wastewater	000' LCU		1,978,436	1,978,436
Net Fixed Assets Value, other activity	000' LCU		-	-
Net Fixed Assets Value, Total	000' LCU		19,784,358	19,784,358
Water production	m3		45,297,032	45,297,032
Wastewater discharges	m3		4,856,312	4,856,312
Number of employees	number		2,152	2,152
extra item, to be added by VK			-	-
extra item, to be added by VK			-	-
extra item, to be added by VK			-	-
extra item, to be added by VK			-	-

2. All payable taxes and fees or charges are divided into two groups:

- Fees/charges payable from the operating profit of the company and deducted before taxation;
- Income tax and taxes/fees payable from the operating profit after tax of the water company (these are typically fines and penalties);

For each of the groups separate selection mechanism are provided where the user selects specific items to be paid, its base, and its rate. Figure 43 shows an example of a selection mechanism for fees and charges.

Figure 43 Section of "Tax item selection" spreadsheet where user defines fees and charges payable

FINANCIAL PLANNING TOOL					
Back					
TAX and PAYABLE FEES AND CHARGES ITEMS		31/03/2005	30/06/2005	30/09/2005	31/12/2005
		Historical	Historical	Historical	Historical
SELECTION OF FEES OR CHARGES PAYABLE FROM OPERATING PROFIT		Fee for water use	Fee for use of road infrastructure	Payments to emergency fund	Fee for providing commercial service to population
Profit before Taxes	YES=1, NO=0				
Sales Revenue, Water, net of VAT	YES=1, NO=0	1			
Sales Revenue, Wastewater, net of VAT	YES=1, NO=0				
Sales Revenue, other activity, net of VAT	YES=1, NO=0				
Sales Revenue, total, net of VAT	YES=1, NO=0		1	1	1
Operational Costs, Water	YES=1, NO=0				
Operational Costs, Wastewater	YES=1, NO=0				
Operational Costs, other activity	YES=1, NO=0				
Operational Costs, Total	YES=1, NO=0				
Salary and Wages (salary fund)	YES=1, NO=0				
Net Fixed Assets Value, Water	YES=1, NO=0				
Net Fixed Assets Value, Wastewater	YES=1, NO=0				
Net Fixed Assets Value, other activity	YES=1, NO=0				
Net Fixed Assets Value, Total	YES=1, NO=0				
Water production	YES=1, NO=0				
Wastewater discharges	YES=1, NO=0				
Number of employees	YES=1, NO=0				
extra item, to be added by VK	YES=1, NO=0				
extra item, to be added by VK	YES=1, NO=0				
extra item, to be added by VK	YES=1, NO=0				
extra item, to be added by VK	YES=1, NO=0				
FEE RATE (In % for LCU base, in 000'LCU/per unit for unit base)		5%	0.80%	1.50%	0.20%
FEES payable from operating profit					
Fee for water use	000' LCU	68,302	66,646	68,030	67,161
Fee for use of road infrastructure	000' LCU	12,321	12,016	12,271	12,111
Payments to emergency fund	000' LCU	23,102	22,530	23,008	22,708
Fee for providing commercial service to population	000' LCU	3,080	3,004	3,068	3,028
tax 1/5	000' LCU	-	-	-	-

In order to complete the selection, follow the following steps:

- Define payable item (name it) in the Cells A60-A64, as also show on the figure. By default the title of payable item is "tax 1/5" for example. User need to change it give to it a specific name.
- That specific name appears in column for tax base selection. For example "Fee for water use" has been entered into Cell A60, it then appears in Cell E32-24.
- For that specific payable item select base from which the payment will be calculated. In the figure above for "Fee for water use" the base "Sales Revenue, Water, net of VAT" has been chosen. The user makes this selection by placing 1 in a respective cell (Cell E36 in the example).
- Then user specifies the tax rate, fee and charges to be paid. In our example the rate of "5%" in Cell E57 has been specified.
- Once all these steps are completed, the payable item is calculated automatically on annual basis. In our example note that "Fee for water use" has been calculated for all years in Row 60.

- Following similar steps, define all payable fees and charges from the company operating profit.
 - Calculated fee and charged items are then aggregated into a single annual payment and deducted from operating profit in the Financial Statements spreadsheet.
3. Exactly the same mechanism is used for defining of income tax and taxes payable from profit after tax (see Figure 44).

Figure 44 Section of "Tax item selection" spreadsheet where user defines taxes payable from profit before tax

FINANCIAL PLANNING TOOL				
Back				
TAX and PAYABLE FEES AND CHARGES ITEMS		31/03/2005	30/06/2005	30/09/2005
		Historical	Historical	Historical
INCOME TAX AND SELECTION OF TAXES/FEES PAYABLE FROM OPERATING PROFIT AFTER TAX		Income tax	tax 1/2	tax 1/3
Profit before Taxes	YES=1, NO=0	1		
Sales Revenue, Water, net of VAT	YES=1, NO=0			
Sales Revenue, Wastewater, net of VAT	YES=1, NO=0			
Sales Revenue, other activity, net of VAT	YES=1, NO=0			
Sales Revenue, total, net of VAT	YES=1, NO=0			
Operational Costs, Water	YES=1, NO=0			
Operational Costs, Wastewater	YES=1, NO=0			
Operational Costs, other activity	YES=1, NO=0			
Operational Costs, Total	YES=1, NO=0			
Salary and Wages (salary fund)	YES=1, NO=0			
Net Fixed Assets Value, Water	YES=1, NO=0			
Net Fixed Assets Value, Wastewater	YES=1, NO=0			
Net Fixed Assets Value, other activity	YES=1, NO=0			
Net Fixed Assets Value, Total	YES=1, NO=0			
Water production	YES=1, NO=0			
Wastewater discharges	YES=1, NO=0			
Number of employees	YES=1, NO=0			
extra item, to be added by VK	YES=1, NO=0			
extra item, to be added by VK	YES=1, NO=0			
extra item, to be added by VK	YES=1, NO=0			
extra item, to be added by VK	YES=1, NO=0			
TAX RATE (In % for LCU base, in 000'LCU/per unit for unit base)		20%		
TAXES payable from operating profit before tax				
Income tax	000' LCU	(24,355)	(23,759)	(24,257)
tax 1/2	000' LCU	-	-	-
tax 1/3	000' LCU	-	-	-
tax 1/4	000' LCU	-	-	-
tax 1/5	000' LCU	-	-	-

4. Calculated tax items are then aggregated into a single annual payment and then sent to "Tax calculation" spreadsheet.

9 Financial statements

The purpose of this spreadsheet is to construct an overview of the financial situation of the Water Utility by providing following statements: Profit and Loss account, Balance spreadsheet, and Cash Flow statement.

9.1 Profit and Loss account

The Profit and Loss account provides an overview of the historical and forecasted revenues from various customer groups and covers expenses from the activities within the Water Utility. In Figure 45 Profit and Loss account is provided.

Figure 45 Profit and Loss account

FINANCIAL PLANNING TOOL								
Back								
FINANCIAL STATEMENTS		31-12-2004	31-12-2005	31-12-2006	31-12-2007	31-12-2008	31-12-2009	31-12-
000' LCU		Historical	Historical	Historical	Forecast	Forecast	Forecast	Forec
INCOME STATEMENT, 000' LCU								
Sales to residential sector		380.631	327.830	437.755	304.269	321.174	334.713	5
Sales to industry		78.855	60.221	82.031	133.210	140.651	146.660	
Sales to budgetary organisations		33.179	25.339	34.516	40.035	42.272	44.078	
Sales to commercial units		-	-	-	-	-	-	
Sales to district heating providers		86.589	66.127	90.077	104.482	110.318	115.031	
Budget subsidies		-	-	-	202.846	214.116	223.142	
TOTAL SALES		579.255	479.517	644.378	784.842	828.530	863.624	
Electricity cost		76.002	75.857	73.865	79.252	86.079	83.707	
Gas and Fuel cost		21.073	24.083	33.938	32.750	31.583	30.423	
Spare parts		2.413	3.368	2.679	2.813	2.924	3.070	
Material costs		162.550	43.104	185.306	195.700	206.791	218.515	2
Purchased water		-	-	-	-	-	-	
Maintenance cost		226.083	242.089	257.325	272.121	287.768	304.315	
Salaries and related costs		81.694	81.694	81.694	86.187	90.927	95.928	
Overheads		4.085	4.085	4.085	4.309	4.546	4.796	
TOTAL OPERATING COSTS		573.900	474.280	638.892	673.133	710.620	740.754	7
OPERATING PROFIT		5.355	5.237	5.487	111.709	117.910	122.869	
FEES		31.642	31.433	36.928	45.110	47.521	49.331	
DEPRECIATION		-	-	-	118.292	118.351	118.409	
BAD DEBT WRITTEN-OFF		-	-	-	-	-	-	
OPERATING PROFIT BEFORE FINANCING		(26.287)	(26.197)	(31.441)	(51.693)	(47.961)	(44.870)	(1)
Interest income/expense		-	-	-	-	(5.469)	(10.938)	

Profit and Loss account (sometimes referred to as Income Statement) provides information about the operating profitability of Water Utility on an annual basis. In the spreadsheet " Summary and key ratios", the profit and loss account, as well as other financial statements, are summarised on an annual basis.

9.2 Balance spreadsheet

The purpose of the Balance spreadsheet is to provide overview of assets and liabilities. It presents a snapshot of resources available to the Water Utility and its obligations (liabilities). The asset part of the balance spreadsheet reports on the effect of investment decisions. The liability and equity part of the balance spreadsheet shows the effects of Water Utility financing decisions. On Figure 46 Balance spreadsheet is provided.

Figure 46 Balance spreadsheet snapshot

FINANCIAL PLANNING TOOL											
Back											
FINANCIAL STATEMENTS	31-12-2004	31-12-2005	31-12-2006	31-12-2007	31-12-2008	31-12-2009	31-12-2010	31-12-2011	31-12-2012	31-12-201	
000' LCU	Historical	Historical	Historical	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast
BALANCE SHEET, 000' LCU											
Tangible fixed assets	720.585	690.511	679.248	563.285	447.265	331.185	215.048	98.918	83.716	79.16	
Intangible fixed assets	-	-	-	-	-	-	-	-	-	-	
FIXED ASSETS	720.585	690.511	679.248	563.285	447.265	331.185	215.048	98.918	83.716	79.16	
Cash	386.119	243.211	348.948	398.843	283.879	142.391	97.049	56.734	1.679	(15.88	
Accounts receivable	243.187	260.279	287.713	345.948	577.133	836.370	895.095	934.839	969.769	1.009.67	
Loss provisions	-	-	-	-	-	-	-	-	-	-	
Other current assets	-	-	-	-	-	-	-	-	-	-	
CURRENT ASSETS	629.306	503.490	636.661	744.791	861.012	978.760	992.145	991.573	971.448	993.80	
TOTAL ASSETS	1.349.892	1.194.001	1.315.908	1.308.076	1.308.277	1.309.946	1.207.192	1.090.491	1.055.164	1.072.96	
Accounts payable	569.815	470.196	634.807	668.823	706.073	735.958	767.769	780.395	775.674	803.94	
Tax	-	-	-	-	-	-	-	-	-	-	
VAT	-	-	-	-	-	-	-	-	-	-	
Payroll	85.779	85.779	85.779	90.497	95.474	100.725	106.265	112.109	111.706	116.73	
Short term debt	-	-	-	-	-	-	-	-	-	-	
CURRENT LIABILITIES	655.594	555.974	720.586	759.320	801.547	836.683	874.034	892.504	887.380	920.67	
LONG-TERM DEBT	-	-	-	466	932	1.398	1.478	1.557	2.037	2.51	
Authorised capital	670.973	676.141	632.138	632.138	632.138	632.138	632.138	632.138	632.138	632.13	
Other capital	(3.290.030)	(2.725.208)	(2.160.386)	(1.595.564)	-	-	-	-	-	-	
Grants	-	-	-	-	-	-	-	-	-	-	
Profit current year	(26.287)	(26.197)	(31.441)	(51.693)	(42.492)	(33.933)	(140.185)	(135.251)	(30.682)	(15.97	
Retained earnings	-	(26.287)	(52.484)	(83.925)	(83.382)	(125.874)	(159.807)	(299.992)	(435.243)	(465.92	
EQUITY	(2.645.344)	(2.101.551)	(1.612.173)	(1.099.044)	506.264	472.331	332.146	196.895	166.213	150.23	
TOTAL LIABILITIES	(1.989.751)	(1.545.577)	(891.587)	(1.399.258)	1.308.743	1.310.419	1.207.658	1.090.957	1.055.630	1.073.43	

The Balance spreadsheet aggregates information on assets and liability on a annual basis. In the spreadsheet " Summary and key ratios" the Balance spreadsheet is summarised on an annual basis.

9.3 Cash flow

Cash Flow statement provides an overview of the Water Utility fund's spending and the fund's income. In other words, in this statement it is possible to see where the money comes from and how it is spent within the utility. The statement classifies all cash flows relating to operating activities or financing/investment activities in the Water Utility. On Figure 47, Cash Flow statement is provided.

Figure 47 Cash Flow statement

FINANCIAL PLANNING TOOL											
Back											
FINANCIAL STATEMENTS		31-12-2004	31-12-2005	31-12-2006	31-12-2007	31-12-2008	31-12-2009	31-12-2010	31-12-2011	31-12-2012	
000' LCU		Historical	Historical	Historical	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	
CASH FLOW, 000 LCU											
OPERATING INCOME AFTER TAX		(26.287)	(26.197)	(31.441)	(51.693)	(42.492)	(33.933)	(140.185)	(135.251)	(30.682)	
Depreciation		-	-	-	118.292	118.351	118.409	118.468	118.460	19.532	
Net cash flow		(26.287)	(26.197)	(31.441)	66.600	75.858	84.476	(21.717)	(16.791)	(11.151)	
WORKING CAPITAL											
Change in receivables		(243.187)	(17.092)	(27.434)	(58.235)	(231.185)	(259.237)	(58.726)	(39.743)	(34.930)	
Change in loss provisions		-	-	-	-	-	-	-	-	-	
Change in other current assets		-	-	-	-	-	-	-	-	-	
Change in accounts payable		569.815	(99.619)	164.611	34.017	37.250	29.885	31.811	12.625	(4.721)	
Change in taxes		-	-	-	-	-	-	-	-	-	
Change in VAT		-	-	-	-	-	-	-	-	-	
Change in payroll		85.779	-	-	4.718	4.977	5.251	5.540	5.845	(403)	
Change in other short term debt		-	-	-	-	-	-	-	-	-	
Changes in capital		412.407	(116.712)	137.178	(19.501)	(188.958)	(224.101)	(21.374)	(21.273)	(40.054)	
Net Cash INFLOW/(OUTFLOW) from operations		386.119	(142.908)	105.737	47.099	(113.099)	(139.624)	(43.091)	(38.064)	(51.205)	
Investments		-	-	-	2.330	(2.330)	(2.330)	(2.330)	(2.330)	(4.330)	
FINANCIAL INFLOWS											
Loan 1		-	-	-	466	466	466	466	466	866	
Loan 2		-	-	-	-	-	-	-	-	-	
Donors		-	-	-	-	-	-	-	-	-	
State budget		-	-	-	-	-	-	-	-	-	
Biennial budget		-	-	-	-	-	-	-	-	-	

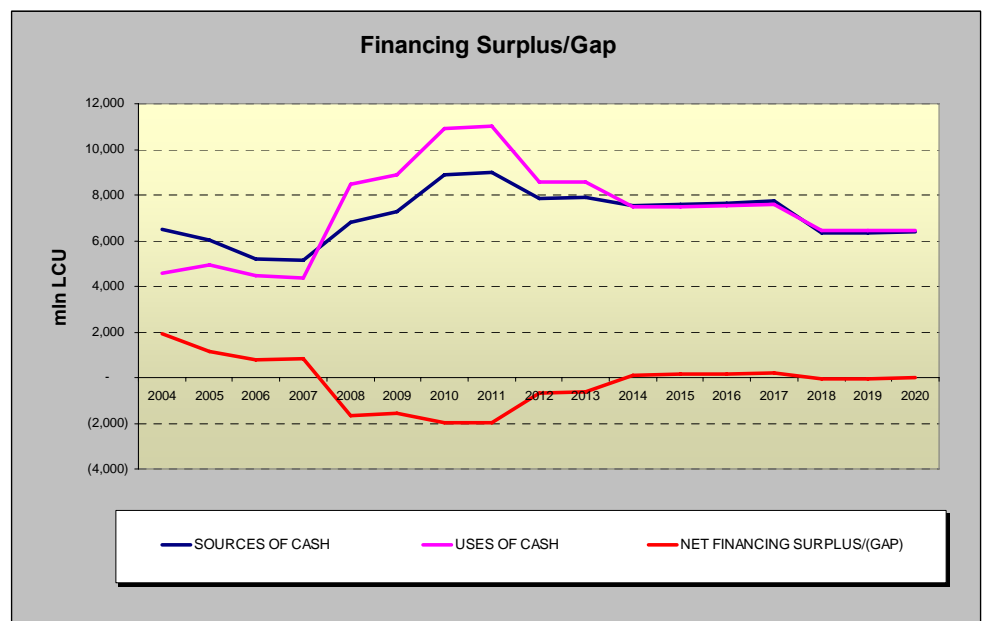
Cash Flow statement aggregates monetary inflow and outflow information on an annual basis. In the spreadsheet " Summary and key ratios" Cash Flow statement is summarised on an annual basis.

10 Charts

Four charts are presented in the model with the purpose of visualising the most important financial and operational variables. These are:

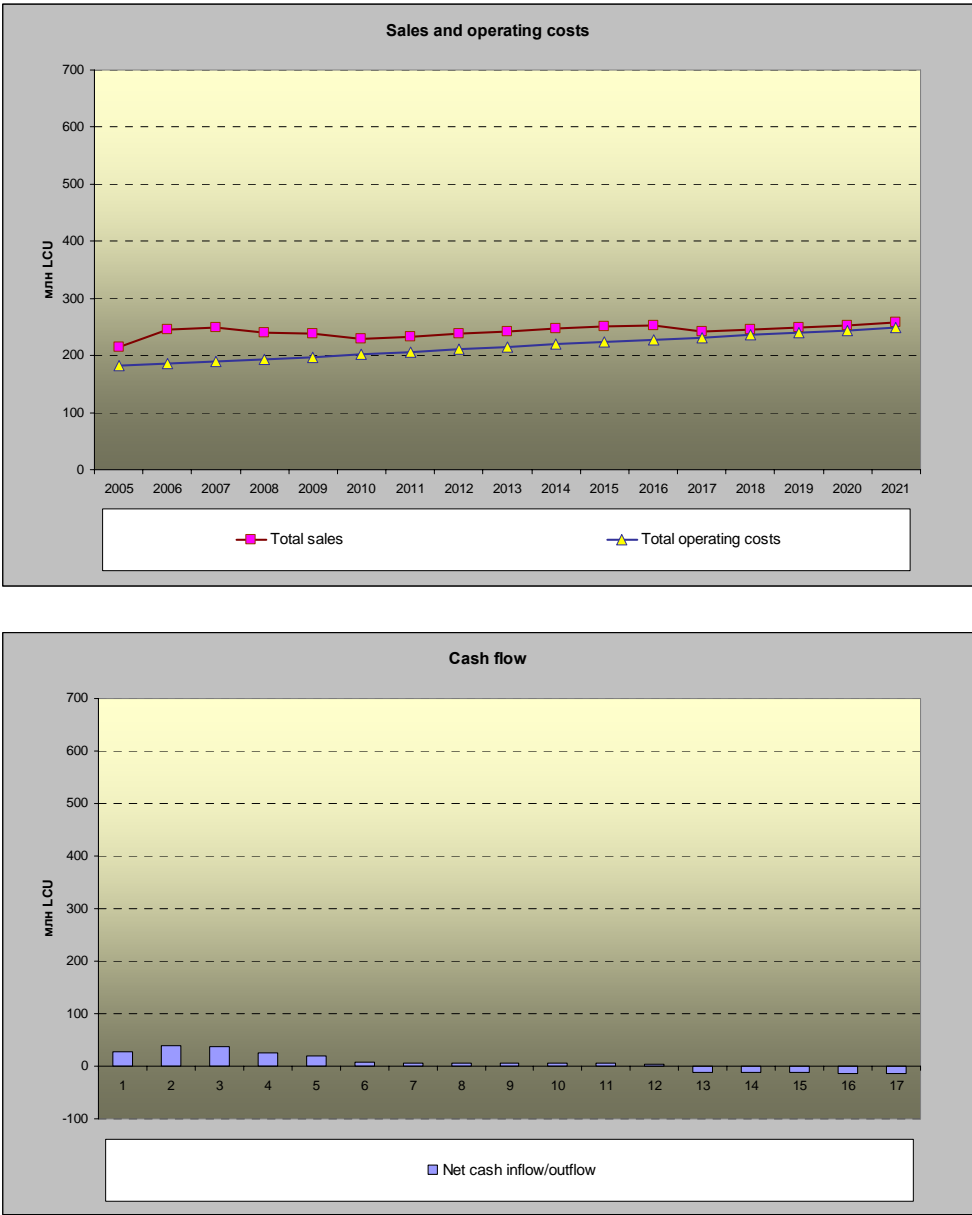
- Financial surplus or gap

Figure 48 *Financial gap or surplus*



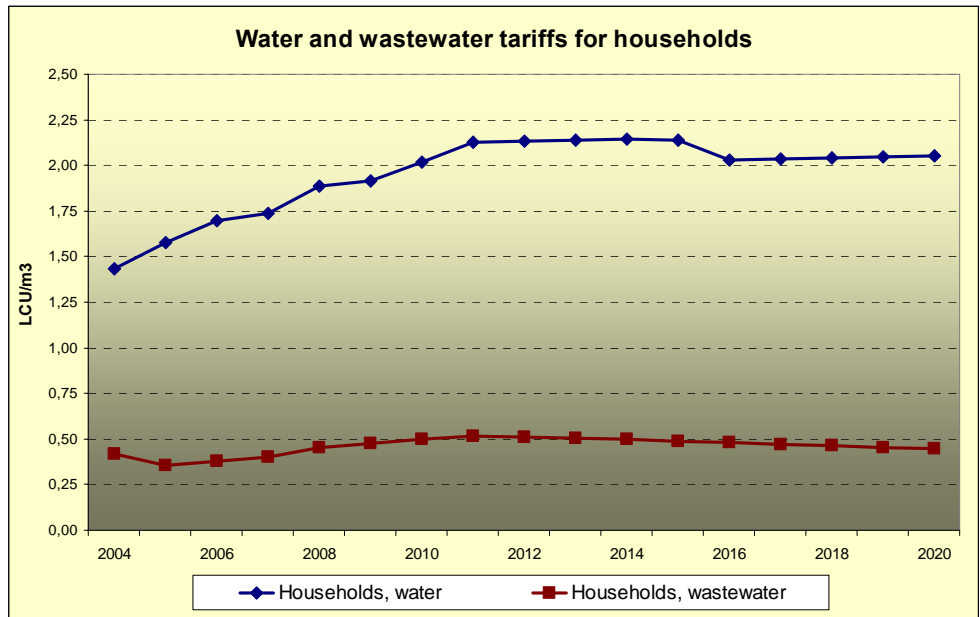
- Total sales;
- Total operating costs;
- Net cash inflow/outflow

Figure 49 Sales, costs, and net cash flows



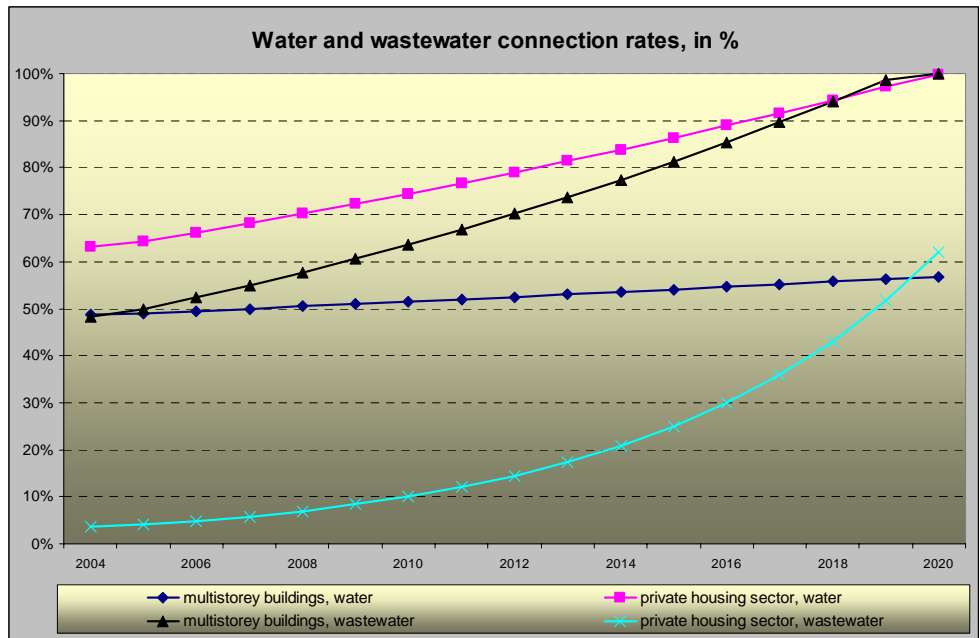
- Household water tariff development;
- Household wastewater tariff development;

Figure 50 Tariff development



- Connection rates of households to water and wastewater system;

Figure 51 Connection rates to water and wastewater systems



- Operating margin;
- Profit margin.

Figure 52 Operating margin

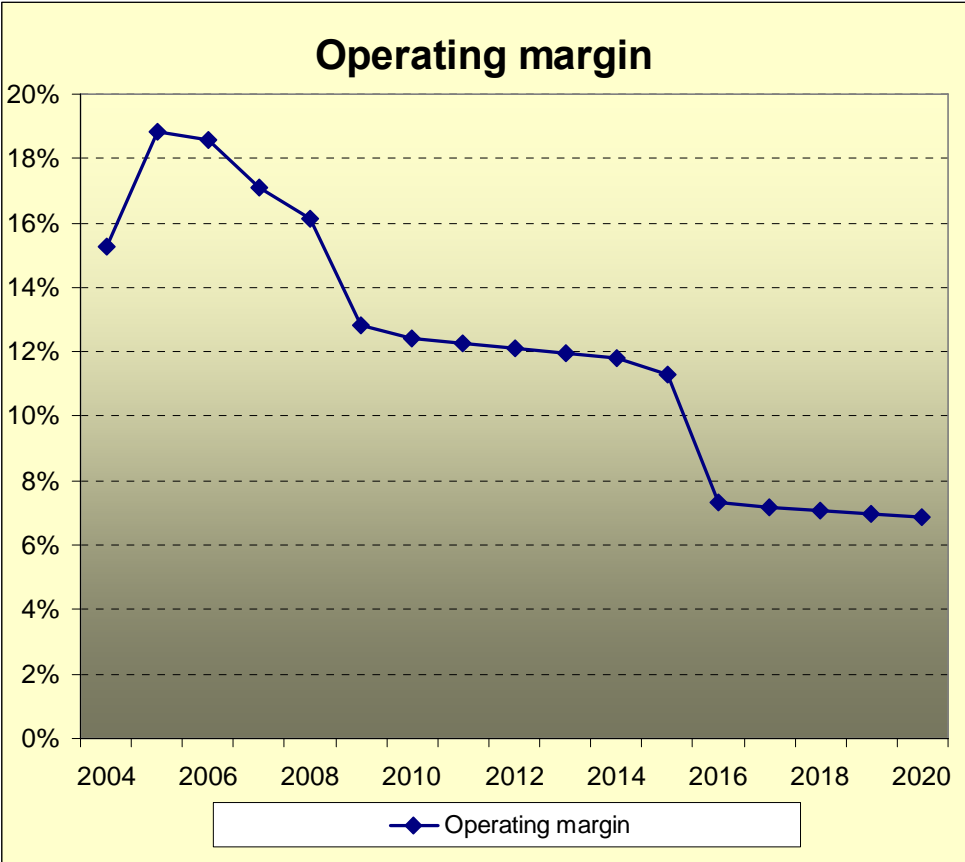


Figure 53 Profit margin

