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## Guide to DNSP Economic Benchmarking Files

The Zip file '*Supporting files-DNSP-10Oct2021.zip*' contains the following folders and files:

### 1. DNSP Benchmarking Data Files (2020 update) AER

Includes the following files:

- *2020 AER VCR values.xlsx* – calculates price series Customer Minutes Off-supply (CMOS) per DNSP and per State based on Values of Customer Reliability (VCR);
- *DNSP AUC calculation (2020).xlsx* – assembles annual user costs for the five capital inputs;
- *DNSP consolidated benchmarking data (2020).xlsx* – database file assembles variables used in the MTFP and MPFP analysis at the DNSP level in at the industry level from the AER's Economic Benchmarking Regulatory Information Notice (EBRIN) returns and the intermediate files listed above.

### 2. Stata Data Management Files

These files are under three sub-directories.

- Stata Input Data File
- Stata Data Mgt Programs
- Stata Data Mgt Outputs.

#### 2.1 Stata Input Data File

- *DNSPbench\_v3.xlsx* – Includes benchmarking data extracted from *DNSP consolidated benchmarking data (2020).xlsx*.

#### 2.2 Stata Data Mgt Programs

- *crDNSPbench-firm3.do* – Reads from the file *DNSPbench\_v3.xlsx* (specifically, the worksheet 'Shazam DNSP Data') and creates data files for use in Shazam (see section 3 below) and in Stata (see section 4 below). The Stata data files are in Stata format, and include *dnspsbench-firm3.dta* and *dnspsbench-firm3x.dta* described in 'Stata Data Mgt Outputs' below. The Shazam data files are in CSV format, and include:
  - files for individual DNSPs (AGDdata.csv; ANDdata.csv; CITdata.csv; ENDdata.csv; ENXdata.csv; ERGdata.csv; ESSdata.csv; EVOdata.csv; JENdata.csv; PCRdata.csv; SAPdata.csv; TNDdata.csv; UEDdata.csv).
  - a pooled data file for all DNSPs (DNSPdata.csv), and
  - an aggregated industry data file (DINDdata.csv).

- *crDNSPbench-state3.do* – Reads the file *DNSPbench\_v3.xlsx* (specifically, the worksheet ‘Shazam State Data’) and creates data files for use in Shazam and in Stata. The Stata data file is: *dnspbench-state3.dta*, described in ‘Stata Data Mgt Outputs’ below. The Shazam data files are in CSV format, and include:
  - files for each State (DACTdata.csv; DNSWdata.csv; DQLDdata.csv; DSAdata.csv; DTASdata.csv; DVICdata.csv);
  - a pooled data file for all States (STATEData.csv).

### 2.3 Stata Data Mgt Output

- *crDNSPbench-firm3.log* – the (text) log file generated by running the Stata program of the same name;
- *crDNSPbench-state3.log* – the (text) log file generated by running the Stata program of the same name;
- *dnspbench-firm3.dta* – Stata panel dataset for 13 DNSPs and 15 years sorted by DNSP and Year;
- *dnspbench-firm3x.dta* – Similar to *dnspbench-firm2.dta* except the aggregated industry data is appended to the dataset and coded as DNSP 14;
- *dnspbench-state3.dta* – Stata panel dataset for 6 States and 15 years sorted by State and Year.

## 3. Shazam Files

These files are under three sub-directories.

- *Shazam Data Input Files*: Data files in CSV format which are read by Shazam programs;
- *Shazam DNSP Programs*: Shazam programs which carry out MTFP calculations and regression-based growth rates. They are included here as text files to aid readability. To run them in Shazam, the file extensions need to be changed to ‘.sha’;
- *Shazam Outputs*: The results from the Shazam program in text files.

### 3.1 Shazam Data Input Files

- *AGDdata.csv* – Data for Ausgrid (AGD)
- *ANDdata.csv* – Data for AusNet Distribution (AND)
- *CITdata.csv* – Data for CitiPower (CIT)
- *ENDdata.csv* – Data for Endeavour Energy (END)
- *ENXdata.csv* – Data for Energex (ENX)
- *ERGdata.csv* – Data for Ergon Energy (ERG)
- *ESSdata.csv* – Data for Essential Energy (ESS)
- *EVOdata.csv* – Data for Evoenergy (EVO)
- *JENdata.csv* – Data for Jemena (JEN)

- *PCRdata.csv* – Data for Powercor (PCR)
- *SAPdata.csv* – Data for SA Power Networks (SAP)
- *TNDdata.csv* – Data for TasNetworks Distribution (TND)
- *UEDdata.csv* – Data for United Energy (UED)
- *DINDdata.csv* – Aggregated data for the DNSP industry as a whole
- *DNSPdata.csv* – Pooled data for 13 DNSPs stacked as panel data
- *DACTdata.csv* – Data for the ACT
- *DNSWdata.csv* – Data for NSW
- *DVICdata.csv* – Data for VIC
- *DQLDdata.csv* – Data for QLD
- *DSAdata.csv* – Data for SA
- *DTASdata.csv* – Data for TAS
- *STATEData.csv* – Pooled data for 6 States stacked as panel data.

### 3.2 Shazam Program Files

- *D1mtfpEVO21.txt* – Program for EVO
- *D2mtfpAGD21.txt* – Program for AGD
- *D3mtfpCIT21.txt* – Program for CIT
- *D4mtfpEND21.txt* – Program for END
- *D5mtfpENX21.txt* – Program for ENX
- *D6mtfpERG21.txt* – Program for ERG
- *D7mtfpESS21.txt* – Program for ESS
- *D8mtfpJEN21.txt* – Program for JEN
- *D9mtfpPCR21.txt* – Program for PCR
- *D10mtfpSAP21.txt* – Program for SAP
- *D11mtfpAND21.txt* – Program for AND
- *D12mtfpTND21.txt* – Program for TND
- *D13mtfpUED21.txt* – Program for UED
- *D14mtfpDIND21.txt* – Program for whole industry
- *D41mtfpACT21.txt* – Program for ACT
- *D42mtfpNSW21.txt* – Program for NSW
- *D43mtfpVIC21.txt* – Program for VIC
- *D44mtfpQLD21.txt* – Program for QLD
- *D45mtfpSA21.txt* – Program for SA
- *D46mtfpTAS21.txt* – Program for TAS
- *D50mtfpDNSPpool21.txt* – Program for comparative MTFP analysis of DNSPs
- *D51mtfpSTATEpool21.txt* – Program for comparative MTFP analysis of States.

### 3.3 Shazam Outputs

- *D1mtfpEVO21-out.txt* – Results for EVO
- *D2mtfpAGD21-out.txt* – Results for AGD
- *D3mtfpCIT21-out.txt* – Results for CIT
- *D4mtfpEND21-out.txt* – Results for END
- *D5mtfpENX21-out.txt* – Results for ENX
- *D6mtfpERG21-out.txt* – Results for ERG
- *D7mtfpESS21-out.txt* – Results for ESS
- *D8mtfpJEN21-out.txt* – Results for JEN
- *D9mtfpPCR21-out.txt* – Results for PCR
- *D10mtfpSAP21-out.txt* – Results for SAP
- *D11mtfpAND21-out.txt* – Results for AND
- *D12mtfpTND21-out.txt* – Results for TND
- *D13mtfpUED21-out.txt* – Results for UED
- *D14mtfpDIND21-out.txt* – Results for whole industry
- *D41mtfpACT21-out.txt* – Results for ACT
- *D42mtfpNSW21-out.txt* – Results for NSW
- *D43mtfpVIC21-out.txt* – Results for VIC
- *D44mtfpQLD21-out.txt* – Results for QLD
- *D45mtfpSA21-out.txt* – Results for SA
- *D46mtfpTAS21-out.txt* – Results for TAS
- *D50mtfpDNSPpool21-out.txt* – Results for comparative MTFP analysis of DNSPs
- *D51mtfpSTATEpool21-out.txt* – Results for comparative MTFP analysis of States.

## 4. Stata MTFP Index Analysis Files

Contains Stata programs which duplicate results of the Shazam programs for the purpose of cross-checking. One program also calculates Opex MPFP using a pooled sample for the period 2012 to 2020, which is used only when combining Opex MPFP with econometric results. The files are included in the following two sub-directories:

- Stata Index Programs
- Stata Index Outputs.

The data input file is included as one of the output files in 2 above.

### 4.1 Stata Index Programs

- *anDNSPindivid3.do* – calculates MTFP results for each individual DNSP and the aggregate results for the industry;
- *anDNSPpooled3.do* – calculates comparative MTFP results for DNSPs from pooled data, 2006 to 2020;

- *anDNSPpooled3-post2011.do* – calculates comparative MTFP results for DNSPs from pooled data using a sample from 2012 to 2020;
- *anDNSPstate3.do* – calculates comparative MTFP results for States from pooled data, 2006 to 2020.

## 4.2 Stata Index Outputs

- *anDNSPindiv3.log* – log file from running the program *anDNSPindiv3.do*;
- *mtfp\_dnspxlsx* – spreadsheet with index results for individual DNSPs. These are in separate sheets labelled 1 (EVO) 2 (AGD) 3 (CIT) 4 (END) 5 (ENX), 6 (ERG), 7 (ESS), 8 (JEN), 9 (PCR), 10 (SAP), 11 (AND), 12 (TND), 13 (UED), 14 (DNSP industry). In addition to output, input and TFP indexes, and opex and capital MPFP indexes, results include partial productivities for individual inputs, contributions of individual outputs and inputs to TFP growth, and growth rates of individual outputs and inputs;
- *anDNSPpooled3.log* – log file from running the program *anDNSPpooled3.do*;
- *mtfp\_pooled.xlsx* – spreadsheet with index results for the pooled MTFP analysis of DNSPs (full 15-year sample). These are in a single worksheet. In addition to output, input and TFP indexes, and opex and capital MPFP indexes, results include partial productivities for individual inputs, contributions of individual outputs and inputs to TFP growth, and growth rates of individual outputs and inputs;
- *anDNSPpooled3-post2011.log* – log file from running the program *anDNSPpooled3-post2011.do*;
- *mtfp\_pooled-post2011.xlsx* – spreadsheet with index results for the pooled MTFP analysis of DNSPs for the sample 2012 to 2020 (in a single worksheet);
- *anDNSPstate3.log* – log file from running the program *anDNSPstate3.do*;
- *mtfp\_state.xlsx* – spreadsheet with index results for each State. These are in separate sheets labelled 1 (ACT) 2 (NSW) 3 (VIC) 4 (QLD) 5 (SA), 6 (TAS). In addition to output, input and TFP indexes, and opex and capital MPFP indexes, results include partial productivities for individual inputs, contributions of individual outputs and inputs to TFP growth, and growth rates of individual outputs and inputs.

## 5. DNSP–MTFP Tables-Charts

Excel workbook *DNSP-MTFP Tables-Charts-10Oct2021.xlsx*, into which the results of the foregoing Shazam and Stata programs are input. The workbook produces tables formatted so that they can be copied into the report and charts ready to be copied into the report.

The first sheet of this Excel workbook, ‘ReadMe’, explains the structure of the workbook and how to use it. The second sheet, ‘Labels & Codes’, defines each of the codes used in the Shazam and Stata output files which are the input files to this Excel workbook.

## 6. Stata OpexCost Analysis Files

These files are under three sub-directories.

- Stata Opex Inputs
- Stata Opex Programs
- Stata Opex Outputs.

### 6.1 Stata Opex Inputs

- *Economic Insights AER DNSP NZ Ont Data 3Aug2021.xlsx*: Excel data file which contains data for New Zealand (NZ) and Ontario. The NZ data is in the worksheet ‘DNSP NZ Med 2019ABR’, and the Ontario data is in the worksheet ‘DNSP Ont Med 2019ABR’;

### 6.2 Stata Opex Programs

- *crDNSPopex2.do* – Reads data for Australian DNSP data is drawn from *dnsbenchmark3.dta* and NZ and Ontario from *Economic Insights AER DNSP NZ Ont Data 3Aug2021.xlsx* (see section 6.1 above), and creates the combined data set *DNSPopex2.dta*;
- *anBenchReg2.do* – Carries out the regression analysis for real opex cost function using 2 specifications, Cobb-Douglas (CD) and Translog (TL), and 2 stochastic structures: SFA and LSE with panel-corrected SEs. This program is used for both the models using the full sample period (2006 to 2020) and for the shorter period (2012 to 2020). This involves setting the starting year and end year for the sample period as explained in the documentation at the beginning of the program (i.e. lines 11 to 21). To differentiate the results of running the program with different sample periods, specify the period in the log file name at line 7.

### 6.3 Stata Opex Outputs

These files are under three sub-directories.

- Data-Mgt
- Analysis-Long-period
- Analysis-Short-period.

#### 6.3.1 Data-Mgt

- *crDNSPopex2.log* – log file from running the program *crDNSPopex2.do*;
- *DNSPopex2.dta* – As explained in 6.2 above, this is the consolidated data file of Australian, NZ and Ontario DNSPs for use in the econometric analysis.

#### 6.3.2 Analysis-Long-period

- *anBenchReg2-long.log* – the log file from running the program *anBenchReg2.do* when the sample period 2006 to 2020 is chosen;
- *LSECD.xls*, *LSETLG.xls*, *SFACD.xls*, *SFATLG.xls* – Excel readable files with the results of the regression models of the same name. There are some formatting problems with the SFA models. The purpose of these files is to facilitate copying the results into

*DNSP-OpexFn-10Oct2021.xlsx*, and hence the document. However, some statistics or parameters need to be input into this Excel workbook by hand.

### 6.3.3 Analysis-Short-period

- *anBenchReg2-short.log* – the log file from running the program *anBenchReg2.do* when the sample period 2012 to 2020 is chosen;
- *LSECD.xls*, *LSETLG.xls*, *SFACD.xls*, *SFATLG.xls* – Excel readable files with the results of the regression models of the same name. There are some formatting problems with the SFA models. The purpose of these files is to facilitate copying the results into *DNSP-OpexFn-10Oct2021.xlsx*, and hence the document. However, some statistics or parameters need to be input into this Excel workbook by hand.

## 7. DNSP-OpexCostFn-Tables & Charts

Excel workbook *DNSP-OpexFn-10Oct2021.xlsx*, into which the results of the Opex Cost Function analysis are input. The workbook produces tables formatted so that they can be copied into the report and charts ready to be copied into the report. The data to be inputted include:

- The models from ‘.xls’ files with regression model parameter results as described in sections 6.3.2 and 6.3.3 above;
- Tables of calculated elasticities. These are copied directly from the log file and pasted into the Excel file;
- Opex MPFP estimates copied from *DNSP-MTFP Tables-Charts-28Sep2021.xlsx* (see section 5 above), and from *mtfp\_pooled-post2011.xlsx* (see section 4.2 above).

These steps are explained further in the ‘ReadMe’ worksheet of *DNSP-OpexFn-10Oct2021.xlsx*, which explains the structure of the workbook and how to use it. The worksheet ‘Labels & Codes’, defines each of the codes used in the Shazam and Stata output files which are the input files to this Excel workbook.