**Appendix XX – Analytical Data Table**

| **Feature\_Name** | **Feature\_Type** | **Description** | **Source** | **Data\_Type** | **Values\_Range** | **Missing\_Values** | **Unique\_Values** |
| --- | --- | --- | --- | --- | --- | --- | --- |
| cons\_gas\_12m | Price Statistics | Price-related statistical feature | Price Data Aggregation | int64 | 0.00 to 4154590.00 | 0 | 1716 |
| cons\_last\_month | Price Statistics | Most recent value of cons\_month | Price Data Aggregation | int64 | 0.00 to 771203.00 | 0 | 4225 |
| date\_end | Original | Original feature from client dataset | Client Data | float64 | 0.00 to 1.00 | 0 | 366 |
| date\_modif\_prod | Original | Original feature from client dataset | Client Data | float64 | 0.01 to 1.00 | 0 | 1997 |
| date\_renewal | Original | Original feature from client dataset | Client Data | float64 | 0.00 to 1.00 | 0 | 372 |
| forecast\_cons\_12m | Price Statistics | Price-related statistical feature | Price Data Aggregation | float64 | 0.00 to 82902.83 | 0 | 11222 |
| forecast\_discount\_energy | Original | Original feature from client dataset | Client Data | float64 | 0.00 to 30.00 | 0 | 12 |
| forecast\_meter\_rent\_12m | Original | Original feature from client dataset | Client Data | float64 | 0.00 to 599.31 | 0 | 3145 |
| forecast\_price\_pow\_off\_peak | Price Statistics | Price-related statistical feature | Price Data Aggregation | float64 | 0.00 to 59.27 | 0 | 37 |
| imp\_cons | Original | Original feature from client dataset | Client Data | float64 | 0.00 to 15042.79 | 0 | 6338 |
| margin\_net\_pow\_ele | Price Statistics | Price-related statistical feature | Price Data Aggregation | float64 | 0.00 to 374.64 | 0 | 2162 |
| nb\_prod\_act | Original | Original feature from client dataset | Client Data | int64 | 1.00 to 32.00 | 0 | 10 |
| net\_margin | Original | Original feature from client dataset | Client Data | float64 | 0.00 to 24570.65 | 0 | 9873 |
| num\_years\_antig | Original | Original feature from client dataset | Client Data | int64 | 2.00 to 13.00 | 0 | 12 |
| pow\_max | Original | Original feature from client dataset | Client Data | float64 | 3.30 to 320.00 | 0 | 614 |
| price\_off\_peak\_var\_std | Price Statistics | Standard deviation of price\_off\_peak\_var over time | Price Data Aggregation | float64 | 0.00 to 0.07 | 0 | 2857 |
| price\_off\_peak\_var\_min | Price Statistics | Minimum value of price\_off\_peak\_var over time | Price Data Aggregation | float64 | 0.00 to 0.28 | 0 | 626 |
| price\_off\_peak\_var\_max | Price Statistics | Maximum value of price\_off\_peak\_var over time | Price Data Aggregation | float64 | 0.00 to 0.28 | 0 | 467 |
| price\_off\_peak\_var\_last | Price Statistics | Most recent value of price\_off\_peak\_var | Price Data Aggregation | float64 | 0.00 to 0.28 | 0 | 527 |
| price\_peak\_var\_std | Price Statistics | Standard deviation of price\_peak\_var over time | Price Data Aggregation | float64 | 0.00 to 0.07 | 0 | 1707 |
| price\_peak\_var\_min | Price Statistics | Minimum value of price\_peak\_var over time | Price Data Aggregation | float64 | 0.00 to 0.19 | 0 | 426 |
| price\_peak\_var\_max | Price Statistics | Maximum value of price\_peak\_var over time | Price Data Aggregation | float64 | 0.00 to 0.23 | 0 | 287 |
| price\_peak\_var\_last | Price Statistics | Most recent value of price\_peak\_var | Price Data Aggregation | float64 | 0.00 to 0.20 | 0 | 336 |
| price\_mid\_peak\_var\_mean | Price Statistics | Average value of price\_mid\_peak\_var over time | Price Data Aggregation | float64 | 0.00 to 0.10 | 0 | 1482 |
| price\_mid\_peak\_var\_std | Price Statistics | Standard deviation of price\_mid\_peak\_var over time | Price Data Aggregation | float64 | 0.00 to 0.05 | 0 | 1273 |
| price\_off\_peak\_fix\_mean | Price Statistics | Average value of price\_off\_peak\_fix over time | Price Data Aggregation | float64 | 0.00 to 59.29 | 0 | 517 |
| price\_off\_peak\_fix\_std | Price Statistics | Standard deviation of price\_off\_peak\_fix over time | Price Data Aggregation | float64 | 0.00 to 18.56 | 0 | 459 |
| price\_off\_peak\_fix\_min | Price Statistics | Minimum value of price\_off\_peak\_fix over time | Price Data Aggregation | float64 | 0.00 to 59.21 | 0 | 28 |
| price\_date\_epoch\_mean | Price Statistics | Average value of price\_date\_epoch over time | Price Data Aggregation | float64 | 0.41 to 0.73 | 0 | 23 |
| price\_date\_epoch\_std | Price Statistics | Standard deviation of price\_date\_epoch over time | Price Data Aggregation | float64 | 0.20 to 0.38 | 0 | 23 |
| price\_date\_epoch\_min | Price Statistics | Minimum value of price\_date\_epoch over time | Price Data Aggregation | float64 | 0.00 to 0.45 | 0 | 5 |
| price\_date\_epoch\_max | Price Statistics | Maximum value of price\_date\_epoch over time | Price Data Aggregation | float64 | 0.82 to 1.00 | 0 | 3 |
| off\_peak\_price\_diff | Engineered | Price difference calculation between periods | Feature Engineering | float64 | 0.00 to 0.17 | 0 | 690 |
| off\_peak\_price\_pct\_diff | Engineered | Percentage price difference calculation | Feature Engineering | float64 | 0.00 to 184.49 | 52 | 749 |
| peak\_price\_diff | Engineered | Price difference calculation between periods | Feature Engineering | float64 | 0.00 to 0.15 | 0 | 565 |
| channel\_sales\_MISSING | One-Hot Encoded | One-hot encoded channel sales category: MISSING | Categorical Encoding | bool | 2 unique values | 0 | 2 |
| channel\_sales\_epumfxlbckeskwekxbiuasklxalciiuu | One-Hot Encoded | One-hot encoded channel sales category: epumfxlbckeskwekxbiuasklxalciiuu | Categorical Encoding | bool | 2 unique values | 0 | 2 |
| channel\_sales\_ewpakwlliwisiwduibdlfmalxowmwpci | One-Hot Encoded | One-hot encoded channel sales category: ewpakwlliwisiwduibdlfmalxowmwpci | Categorical Encoding | bool | 2 unique values | 0 | 2 |
| channel\_sales\_fixdbufsefwooaasfcxdxadsiekoceaa | One-Hot Encoded | One-hot encoded channel sales category: fixdbufsefwooaasfcxdxadsiekoceaa | Categorical Encoding | bool | 2 unique values | 0 | 2 |
| channel\_sales\_foosdfpfkusacimwkcsosbicdxkicaua | One-Hot Encoded | One-hot encoded channel sales category: foosdfpfkusacimwkcsosbicdxkicaua | Categorical Encoding | bool | 2 unique values | 0 | 2 |
| channel\_sales\_lmkebamcaaclubfxadlmueccxoimlema | One-Hot Encoded | One-hot encoded channel sales category: lmkebamcaaclubfxadlmueccxoimlema | Categorical Encoding | bool | 2 unique values | 0 | 2 |
| channel\_sales\_sddiedcslfslkckwlfkdpoeeailfpeds | One-Hot Encoded | One-hot encoded channel sales category: sddiedcslfslkckwlfkdpoeeailfpeds | Categorical Encoding | bool | 2 unique values | 0 | 2 |
| channel\_sales\_usilxuppasemubllopkaafesmlibmsdf | One-Hot Encoded | One-hot encoded channel sales category: usilxuppasemubllopkaafesmlibmsdf | Categorical Encoding | bool | 2 unique values | 0 | 2 |
| has\_gas\_f | One-Hot Encoded | Gas service availability indicator | Categorical Encoding | bool | 2 unique values | 0 | 2 |
| has\_gas\_t | One-Hot Encoded | Gas service availability indicator | Categorical Encoding | bool | 2 unique values | 0 | 2 |
| origin\_up\_MISSING | One-Hot Encoded | One-hot encoded origin category: MISSING | Categorical Encoding | bool | 2 unique values | 0 | 2 |
| origin\_up\_ewxeelcelemmiwuafmddpobolfuxioce | One-Hot Encoded | One-hot encoded origin category: ewxeelcelemmiwuafmddpobolfuxioce | Categorical Encoding | bool | 1 unique values | 0 | 1 |
| origin\_up\_kamkkxfxxuwbdslkwifmmcsiusiuosws | One-Hot Encoded | One-hot encoded origin category: kamkkxfxxuwbdslkwifmmcsiusiuosws | Categorical Encoding | bool | 2 unique values | 0 | 2 |
| origin\_up\_ldkssxwpmemidmecebumciepifcamkci | One-Hot Encoded | One-hot encoded origin category: ldkssxwpmemidmecebumciepifcamkci | Categorical Encoding | bool | 2 unique values | 0 | 2 |
| origin\_up\_lxidpiddsbxsbosboudacockeimpuepw | One-Hot Encoded | One-hot encoded origin category: lxidpiddsbxsbosboudacockeimpuepw | Categorical Encoding | bool | 2 unique values | 0 | 2 |
| origin\_up\_usapbepcfoloekilkwsdiboslwaxobdp | One-Hot Encoded | One-hot encoded origin category: usapbepcfoloekilkwsdiboslwaxobdp | Categorical Encoding | bool | 2 unique values | 0 | 2 |
| margin\_bin | Engineered | Binned margin categories (Low/Medium/High) | Feature Engineering | category | 4 unique values | 0 | 4 |