Amy E. Hirakis
Senior Counsel
Legal Department

800 N. Third Street
Harrisburg, PA 17102
Office: 717-233-1351
ahirakis@nisource.com

M-2022-3030280

E-FILE

June 1, 2022

Rosemary Chiavetta, Secretary
Pennsylvania Public Utility Commission
Commonwealth Keystone Building
400 North Street
Harrisburg, PA 17120

RE: **Columbia Gas of Pennsylvania, Inc. (120700)**
Annual Resource Planning Report
Summary Report and Forms 3-9

Dear Ms. Chiavetta:

Enclosed for electronic filing please find Columbia Gas of Pennsylvania, Inc.'s 2022 Annual Resource Planning Summary Report and Forms 3 through 9.

Should you have any questions, please do not hesitate to contact the undersigned at (717) 233-1351.

Very truly yours,

Amy E. Hirakis

/kak
Enclosure

Enclosures

cc: Paul Diskin/Bureau of Technical Utility Services
Patrick Cicero/Office of Consumer Advocate
Teresa Wagner/Office of Small Business Advocate
Richard Kanaskie/Bureau of Investigation and Enforcement

BEFORE THE PENNSYLVANIA PUBLIC UTILITY COMMISSION

Columbia Gas of Pennsylvania, Inc.
121 Champion Way, Suite 100
Canonsburg, PA 15317

2022 Annual Resource Planning Summary Report

Filed: June 2022

Information Submitted in Compliance with and Pursuant to Title 52
Pennsylvania Code Sections 59.81-59.84

COLUMBIA GAS OF PENNSYLVANIA, INC.
Annual Resource Planning Summary Report

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INTRODUCTION

By Order entered January 11, 1996 the Pennsylvania Public Utility Commission (PUC) adopted final regulations (52 PA Code §§ 59.81 - 59.84) which set forth revised requirements for filing annual resource planning reports (the Plan). The Plan submitted represents Columbia Gas of Pennsylvania's (CPA or the Company) belief that integrated resource planning (IRP) is a workable approach to utility planning.

This plan summary contains historical data and projections for annual, winter, and peak day supply to meet projected customer requirements in a least cost manner, while ensuring adequate and reliable service. It is organized into the following 6 sections:

I. Columbia's Overall Approach to Integrated Resource Planning

II. Demand Forecasting Methodology and Assumptions

III. Design Day Forecasting Methodology and Assumptions

IV. Three Year Resource Implementation Plan

V. CPA Service Territory Description and Map

VI. Summary Tables

I. COLUMBIA'S OVERALL APPROACH TO INTEGRATED RESOURCE PLANNING

CPA views integrated resource planning (IRP) as part of an approach to utility management energy resource decision-making. This involves the integration of a number of planning processes; the unbiased evaluation of both supply-side and demand-side management (DSM) strategies; and the explicit recognition of the changing business, regulatory and competitive environments within which local distribution company (LDC) managers must plan and operate.

A successful IRP program should give sufficient consideration to an LDC's obligation to provide adequate and reliable service to its customers, and its role as supplier of last resort. The focus of IRP activities should be the optimal balance of low total societal costs associated with energy consumption; low total customer energy bills; low average system-wide unit costs; enhanced shareholder value; and mitigated environmental impact of energy resource decisions.

CPA also believes that in order to maximize the benefits to the energy consumers in the state of Pennsylvania, the practice of a comprehensive approach to IRP should consider end-uses and the optimal selection of fuel source based on consideration of conserving resources, energy and improving air quality.

CPA's overall IRP objective is to obtain a resource mix consisting of supply-side and demand-side resource options that satisfies customers' energy needs in a manner that balances costs, reliability and environmental impacts in both the short and long term.

THE ROLE OF IRP

Integrated resource planning began in the 1970s as a response to changes in the electric utility industry. Increased uncertainty and risk caused by intermittent demand growth, increased competition from sources such as cogeneration, and risks associated with constructing new generation facilities caused electric utilities and regulators to re-evaluate traditional planning processes. In addition, there was greater diversity in energy resource options which challenged the traditional utility planning assumption that energy demand was a "given." Faced with many of the same concerns regarding risks, uncertainty and the need to consider a broader range of energy resource options, a number of regulatory commissions and natural gas utilities have adopted the IRP process.

Natural gas is a fuel of choice, facing competition from alternate energy sources for almost all end-uses. As such, the natural gas industry has historically operated in a competitive environment. This level of competition has increased for LDCs. Economic climates along with other factors such as increasing gas costs have caused energy consumers, on a national and global level, to place greater emphasis on controlling energy costs. Deregulation and increased access to alternate energy sources for end-users have caused greater competition in the energy marketplace.

Technological improvements have resulted in greater end-use efficiencies. This, combined with increased environmental awareness on a global scale has led to the advancement of energy conservation and energy efficiency. This has resulted in stricter codes and standards for equipment, appliances, buildings and homes. As these energy-efficient appliances, codes and standards have been applied through the normal building and appliance replacement life-cycle, customers have been

given an unprecedented ability to reduce household energy consumption.

Integrated resource planning provides a mechanism to address the new challenges of our industry. Properly developed, IRP pulls together a number of traditional planning processes, explicitly recognizes and accounts for uncertainties, gives equal considerations to supply- and demand-side resource options and recognizes that the integrated resource plan is a *living document* that is updated and modified to reflect changes in relevant parameters and increased knowledge and experience.

DSM

Certain DSM activities can be an important element of utility resource management, especially when targeted to specific, well-defined applications such as those involving low-income customers. Demand side planning is the process of identifying, evaluating and selecting the most effective means of managing customer requirements for natural gas. Within the context of IRP, DSM represents one broad category of resource options with which current and future energy requirements can be met. Some potential benefits of implementing appropriate DSM programs could be enhanced customer value, lower total societal costs, lower consumer energy bills, increased overall resource energy and end-use efficiency, improved overall system efficiency and utilization, reduced environmental degradation and the promotion of economic development.

II. DEMAND FORECASTING METHODOLOGY AND ASSUMPTIONS

BASIC ASSUMPTIONS

Columbia Gas of Pennsylvania, Inc. (CPA) obtains historic and forecasted data for national, state and local economic and demographic concepts from IHS Inc (IHS). CPA obtains historic and forecasted data for energy efficiency concepts from Itron, Inc. (Itron). Both IHS and Itron are well-known and reputable firms in the utility forecasting industry. CPA also obtains historic and forecasted natural gas prices from the U.S. Energy Information Administration (EIA). These data are used in building econometric models that are used in the demand forecasts on Form 1A. The basis for the peak day demand forecast on Form 1B is explained in a separate section.

PENNSYLVANIA AND SERVICE AREA PROJECTIONS

CPA Economic Growth - CPA relies upon IHS's state-level and county-level forecasts of a series of economic variables, including number of households, housing starts, income, population, commercial employment, gross county product, and industrial production. These forecasts are consistent with IHS's national forecasts.

CPA Energy Prices - Historical and forecasted natural gas price data are collected from EIA based on class (residential, commercial, industrial) and territory (state). Afterward, the price of natural gas is divided by the consumer price index to yield an inflation – adjusted price of gas.

RESIDENTIAL AND COMMERCIAL DEMAND FORECAST METHODOLOGY

The demand forecast for the residential and commercial classes of customers has two main components: the number of customers and the average gas use per customer (UPC). The analytical work that supports the demand forecast is based upon data accumulated for CPA's service territory. The forecast insights and trends from this analysis are then used as the basis to project demand for the company.

CUSTOMERS

Residential and commercial customer forecasts were developed using monthly econometric models of total customer count. The residential monthly econometric model of total customers specifies monthly total customer count as a function of number of households, and monthly fluctuations in the intercepts (using binary variables). The commercial monthly econometric model of total customers specifies monthly total customers as a function of real gross county product, and monthly fluctuations in the intercepts (using binary variables).

CPA Residential monthly customers $= a_0 + ß_1 \times (HHC) + ß_i \times M_i + ß_j \times D_j$

CPA Commercial monthly customers $= a_0 + ß_1 \times (RGCP) + ß_i \times M_i + ß_j \times D_j$

where:

a_n, $ß_n$ = model coefficients
M_i = a set of binary variables to quantify the monthly shifts in customers for the models
D_j = a set of binary variables to quantify the structural break points
HHC = numbers of households at county level
RGCP = Real Gross County Product

USE PER CUSTOMER

One econometric model of total UPC is estimated for the total residential class, and one econometric model of total UPC is estimated for the total commercial class. Each model is monthly, allowing forecasts of July and August values from these models to provide the basis for calculating non-temperature-sensitive UPC and allowing forecasts of UPC values for the remaining months to provide the basis for calculating temperature-sensitive UPC.

The monthly econometric models specify actual UPC as a function of independent variables chosen from a set of variables representing real gas prices, economic conditions, gas-using equipment efficiency, monthly fluctuations in the intercepts (using binary variables), and weather. The residential and commercial UPC equations have the following form:

$$\text{CPA monthly total UPC} = a_0 + ß_1\times(P) + ß_2\times(MAR) + ß_3\times(HDD) + ß_i\times M_i + ß_j\times D_j$$

where:

a_n, $ß_n$	=	model coefficients
M_i	=	a set of binary variables to quantify the monthly shifts in volumes for the models
D_j	=	a set of binary variables to quantify the structure breaks
MAR	=	energy intensity variable (residential model)
P	=	real average price of natural gas
HDD	=	heating degree days

Addressing effects of COVID-19 on the forecast

The data indicates that COVID-19 had three major impacts on customer counts and usage. First, on a very short-term basis, the shutdowns associated with COVID-19 appear to have affected use per customer for some classes in the spring of 2020. These short-term impacts are addressed when necessary, by including a dummy variable in the econometric model to account for specific months in 2020 in which the use per customer significantly differed from what would have been expected absent the shutdowns. These impacts on use per customer are not expected to persist into the forecast period as the most significant shut-downs are largely over. Therefore, it is not necessary to make additional adjustments to the forecast associated with impacts on use per customer associated with the temporary COVID-19 shut-downs.

Second, prohibitions on terminations of customers (i.e., moratoriums on customer shut-offs) due to the economic effects of COVID-19 ("COVID-19 Moratoriums") affected customer counts in 2020. These short-term impacts are addressed, when necessary, by including a dummy variable in the econometric model to account for specific months in 2020 in which the customer count significantly differed from what would have been expected absent the COVID-19 Moratoriums. These impacts on customer counts are not expected to persist into the forecast as the COVID-19 Moratoriums are over. Therefore, it is not necessary to make additional adjustments to the forecast associated with impacts on customer counts associated with the COVID-19 Moratoriums.

Third, COVID-19 has affected the local and national economy, which in turn affects natural gas customers and usage. The economic impacts associated with COVID-19 are incorporated into the forecast through the use of economic independent variable data. Historical and forecasted economic data series used in the econometric models reflect the economic outlook of IHS Global Insight as of

December 2021. Therefore, short term and long term COVID-19 economic impacts on customer counts and usage are incorporated in the forecasts produced by the econometric models and therefore the forecasts do not require further adjustment to account for economic conditions related to COVID-19.

VOLUMES

Gas volume is calculated monthly by multiplying forecasted UPC by forecasted customers. The reasonableness of the forecasted volumes are gauged by ensuring that forecast patterns are reflective of recent historical patterns as well as the company's new business department's intelligence on future projects. Calendar month demands are obtained by adding an adjustment for unbilled volume.

Transportation Volume

The models described thus far are used to forecast total throughput. This section describes the methodologies used to forecast transportation volume that is subtracted from the throughput forecast to arrive at tariff sales volume.

Traditional (non-Choice) transportation volume for the commercial class is forecasted based on forecasts of large transportation customers provided by the Large Customer Relations group, past levels, and trend. Similarly Forecasted Choice Transportation volume is forecasted based on past levels and trend.

INDUSTRIAL FORECASTING METHODOLOGY

The monthly industrial forecast is provided by CPA's Large Customer Relations group by incorporating information generated through individual customer interviews concerning expectations of future industrial gas demand. Since the Large Customer Relations group cover over 90% of the total industrial volumes, it is assumed that the remaining industrial customers grows at the same rate as those forecasted by the Large Customer Relations group.

Transportation volume for the industrial class is forecasted based on forecasts of large transportation customers provided by the Large Customer Relations group, past levels, and trend. Forecasted transportation volume is subtracted from total industrial demand to arrive at tariff sales volume.

III. DESIGN DAY FORECASTING METHODOLOGY AND ASSUMPTIONS

Each year, a five-year estimate of the requirements anticipated under Columbia Gas of Pennsylvania, Inc's. (CPA) design day operating conditions is prepared to ensure that adequate supplies are contracted at a level so that CPA can fulfill its utility obligation to its firm customer requirements at Design Day Conditions. The projected demands, as generated in CPA's 2021 Design Day Forecast (DDF) and shown on Form 1B (attached), represent the sum total of CPA's Design Day Demand calculated at the Design Current Day Temperature, Design Prior Day Temperature, Design Current Day Wind Speed, and assume Design Day occurrence on a weekday for each of CPA's eight Pipeline Scheduling Points (PSPs).

Design Current Day Temperature results from the Gumbel Distribution of annual minimum temperatures for all available years of history through heating season 2014/2015 for the National Weather Service Stations located at Hagerstown, Maryland; Morgantown, West Virginia; and Harrisburg, Pittsburgh, and Bradford, Pennsylvania. These are the weather stations within or having proximity to CPA's service territory that are used to discern customers' sensitivities to the weather variables of temperature and wind speed. The Design Current Day Temperature is premised upon a risk level having a 1 in 15 probability of occurrence. That is, the probability is 6.7 percent, or 1 in 15, that any given winter will have one or more days with an average daily temperature equal to or colder than CPA's design temperature. CPA's company-wide Design Current Day Temperature is -5 degrees Fahrenheit.

Design Prior Day Temperature results from the mean temperature difference between historical cold days and their associated prior days. Cold days are defined as those days that are no warmer than the Design Current Day Temperature plus 5 degrees Fahrenheit. This resultant average difference is then added to the Design Current Day Temperature to give Design Prior Day Temperature. CPA's company-wide Design Prior Day Temperature is 6 degrees Fahrenheit.

Consistent with the Design Prior Day Temperature methodology, the approach of using an average of cold days is used to establish Design Current Day Wind Speed. Because Wind Speed data has only been available since 1991/92, Design Current Day Temperature plus five degrees Fahrenheit does not give many observations for a representative average. Using Cold Days defined as 15 degrees plus Design Current Day Temperature provides more observations per station. CPA's company-wide Design Current Day Wind Speed is 11 mph.

These design conditions are developed for each of the aforementioned National Weather Service Stations used by CPA. The associated factors for each station are then weighted as a function of the firm demand associated with each weather station to arrive at the design conditions for each PSP and CPA in aggregate.

The DDF methodology has the following eight steps.

Step 1. Obtaining Actual Total Daily Demand

The first step in the preparation of the DDF is to obtain the actual total daily demand that was observed in the months of December through February from the most recent two heating seasons. CPA derives the actual total daily demand by cumulating daily supply data from all sources. Based on twelve months ending December 2021, CPA has 97% of its total deliveries daily measured at

the **P**oint **o**f **D**elivery (POD). The volumes that are monthly read are allocated to a daily volume using a base load / heat load allocation process. The daily volume for every POD is summarized to produce the actual total daily demand for each for each PSP.

Step 2. Obtaining Non-Firm Daily Demand

The second step is the calculation of the daily demand for CPA's industrial and commercial customers receiving services (sales and banking and balancing service) from the Company on a non-firm basis. Approximately 81% of CPA's total non-firm customer demand is subject to daily measurement. This percentage is based on the actual January 2021 throughput for all such customers. For those non-firm customers with monthly meter read capability, CPA estimates their daily consumption using a base load / heat load allocation process.

Step 3. Calculation of Daily Firm Demand

Daily Firm Demand is calculated at the PSP level by subtracting the daily non-firm customer (industrial and commercial) demand, as described above, from the actual total daily demand. The resultant daily demand is considered to be firm customer demand, for supply planning purposes, and is utilized in the regression process described below.

CPA has an additional firm obligation under its Standby Service contracts and **E**lective **B**alancing **S**ervice (EBS) contracts with transportation customers. This is an obligation that CPA stands ready to fulfill on any given day, and is considered in CPA's supply/capacity portfolio. For this reason it is categorized separately from the previously described daily system firm demand. Both Standby Service and EBS projections for each forecast season are held constant at the aggregate customer contract level at the time the DDF is prepared.

Step 4. Regression of Three Demand Components

Using IBM's SPSS Modeler software, regressions are made to obtain coefficients for each PSP, for the following demand components:

1. Daily Firm Demand;
2. Daily Industrial Customer Non-firm Demand; and
3. Daily Commercial Customer Non-firm Demand.

Daily demand data for the months of December, January, and February from the past two heating seasons is analyzed and the three demand components are regressed against a group of four explanatory variables:

1. Current Day Temperature: the average daily temperature for the current day;
2. Prior Day Temperature: the average daily temperature for the prior day;
3. Wind Speed: the average daily wind speed for the current day; and
4. Day Type: weekdays, weekends, and holidays. The holidays are the period December 24 through January 1.

The analysis is performed twice. First, CPA uses all observed days during December through February, and then just those days having average temperatures below 31 degrees Fahrenheit to

better capture customer responsiveness to colder temperatures.

Step 5. Design Actual

The PSP regressed coefficients are then applied to the PSP Design Day Conditions to determine the resulting Design Actual demand. The purpose of calculating the "Design Actual" demand is to quantify, based on actual experience, what the Design Day Demand would equate to if Design Day Conditions had occurred for the subject period of time. CPA uses the 2020/21 Design Actual for firm (exclusive of Standby Service and EBS quantities) and total (sum of firm plus non-firm) demand along with prior winters' Design Actuals as inputs in the growth process to project the 2021/22 - 2025/26 Design Day Demand.

Step 6. Determination of Design Day Demand by Revenue Class

Once the regressions have been performed and the Firm Design Actual and the two (commercial and industrial) non-firm customers' Design Actual demands are known, the allocation of demand types within a revenue class is performed.

Four steps are performed to allocate Firm Demand. In **Step 6a**, the classification Other is calculated. Other includes two categories, Company Use, and Unaccounted-For Gas. Company Use Design Day load is projected to be 1/20th of the January requirement from the 2022 Gas Estimate. The Design Day load of Unaccounted-For Gas is 1/365th of the annual Unaccounted-For Gas load from the Gas Estimate. Other Demand, like Residential Demand, is entirely firm; i.e., it contains no non-firm component.

In **Step 6b**, Industrial Firm Sales is developed by regression analysis of the estimated daily industrial firm sales demand of the most recent winter (derived from monthly billing data for December 2020 through February 2021) against the gas-day average temperature. The design temperature is then applied to the regression equation to arrive at the design industrial firm sales demand.

In **Step 6c**, the remainder of Firm Demand (Firm Demand less Industrial Firm Demand less Other) is allocated to Residential and Firm Commercial based on the estimates of residential and commercial demands as found in the Gas Estimate inclusive of Choice. Once the allocation is complete, the Firm Demand is equal to the sum of the revenue classes' (Residential, Commercial, Industrial, and Other) firm demand component.

In **Step 6d**, the Firm Demand is then further categorized between sales and Choice customer demand. The Choice demands are derived from the input used in the development of CPA's 2022 Gas Estimate. The total Choice Design Day Demand is anticipated to be 133.2 MDth by the last heating season (2025/26) of the 2021 forecast.

Step 7. Design Day Forecast

Several years of the historical Design Actual Demands for each PSP are utilized as the basis for the regressions to determine the Design Day Forecast. The analyses at the PSP level is needed for planning purposes and allows for identifying variances in customer demand over the historical period studied. In the process, the impact on the annual Design Actual Demands of four variables

is determined. Those variables are:

(1) Customer count in the month of January;
(2) Actual weather in the two months (December and January) when the design peak day is most likely to occur;
(3) Actual gas costs; and
(4) Non-farm employment in the core winter months of December through February.

Note that for the purpose of forecasting Firm Design Day Demand, the gas cost considered is the forecasted November PGC price. For projecting Non-Firm Design Day Demand, the forecasted January NYMEX price is utilized. Historical and forecasted non-farm employment values come from the 2020 IHS Global Insight County Forecast and are the average of the December, January, and February values aggregated to the PSP level.

Step 8. Adjustment to Forecast

The 2021 Design Day Forecast includes an adjustment to capture occurrences not entirely reflected in the historical input data. The forecast of CPA's non-firm customer demand has given consideration to a current projection of existing and expected new customer load.

IV. THREE YEAR RESOURCE IMPLEMENTATION PLAN

PLANNING USING SUPPLY/DEMAND BALANCES

Using contractual storage and transportation capacities, and guidelines described in this exhibit, Columbia Gas of Pennsylvania, Inc. (CPA) plans annual, seasonal, and peak day supplies to serve firm customer requirements. For each of the colder, normal, and warmer weather demand scenarios, a plan identifies monthly and daily sources of gas. For each scenario, the total supply is a mixture of transportation, storage, and any peaking supplies. Forms 2A, 2B and 2C (attached) have been developed from the plan information for the normal weather scenario. Form 3 (attached) summarizes the Company's customer forecast.

CPA's "design" plan is based on the colder weather scenario and customer demand corresponding to 1 in 15 risk design day temperature, 1 in 10 risk late-winter-days temperatures, and 1 in 10 risk winter season degree days. Late winter days are recognized to assure supply adequacy, since contractual storage withdrawal capacity decreases as storage inventory is reduced late in the winter.

CPA's supply/demand balances result from using PLEXOS, a PC-based decision support modeling system provided by Energy Exemplar.

STORAGE INJECTIONS, WITHDRAWALS, AND RATCHETS

Storage provides a buffer between demand and supply, both on a seasonal and daily basis. CPA constructs its target injection pattern recognizing end of winter balances, flexibility requirements, gas supply prices and applicable storage injection limitations.

CPA constructs its winter storage withdrawal schedule to reflect daily withdrawal capacity decreasing or ratcheting down during the later parts of the winter season. When the inventory remaining in storage falls below 30% of seasonal contract capacity, daily withdrawal capacity is reduced to 80% of contract maximum. Daily withdrawal capacity declines to 65% of this maximum when storage inventory falls below 20% of seasonal capacity, and finally to 50% of maximum when inventory falls below 10%. CPA determines the largest demand it can serve with its available resources after each ratchet, and then determines the corresponding temperature at which this demand would be expected to occur. Finally, CPA determines the 10 percent risk date for that temperature. CPA then maintains sufficient inventory to postpone each occurrence of ratchet until that date. The risk level of 10 percent means that on average, the design temperature would occur after the design date one winter in ten.

CPA's supply plan assumes the availability of 96-97 percent of the seasonal contract capacity during the November through March winter season because of the following:

(1) CPA enters the winter with roughly 1-2 percent of storage capacity unfilled to allow for storage injections on any warm days in early winter, and
(2) CPA reserves roughly 2 percent of storage inventory at the end of the traditional winter season for withdrawal on cold April days.

DAILY BALANCING

CPA must balance flowing supplies delivered to its distribution system daily with varying customer demands. CPA uses the flexibility provided by storage to provide the majority of this daily balancing requirement. On mild days and weekends with reduced demand, CPA may inject excess scheduled flowing supplies into its storage accounts. On cold days, when customer demand exceeds the

scheduled flowing volumes, CPA will withdraw gas from its storage accounts. CPA's storage contracts have both daily injection and withdrawal limits. To the extent the daily balancing opportunities provided by storage are insufficient to meet the potential demand swings of customers, CPA may reduce or "swing" on its supply contracts.

DESIGN DAY SUPPLY BALANCE

As mentioned previously, CPA maintains minimum firm capacity rights to protect for a 1 in 15 design day to ensure it can reliably satisfy its firm obligations. This includes capacity for PGC customers, Choice customers, Enhanced Balancing Service (EBS) Option 1 and Standby Service. CPA does not consider interruptible gas distribution service customer volumes as reliable Peak Period capacity for its firm demand. Therefore, no interruptible transportation is used for this balance.

LOCAL GAS

During Order 636 restructuring, Columbia Gas Transmission LLC (TCO) assigned CPA Firm Transportation capacity with Appalachian receipt points. CPA must fill this capacity or lose deliverability to nearby markets. CPA fills the majority of the assigned TCO Appalachian capacity with purchases from marketers and aggregators, with the balance filled by purchases from small producers. CPA may also purchase gas supplies from small local producers with wells located near CPA's facilities that deliver gas directly to CPA.

DEMAND SIDE RESOURCES

CPA currently operates two conservation programs as outlined in Form 5 (attached). They are the WarmWise Low-Income Usage Reduction Program (LIURP) and WarmWise Audits & Rebates program. Forms 6-9 attached includes program summary information and the cost-benefit analysis of LIURP and WarmWise Audits & Rebates.

CPA will continue implementing its residential energy efficiency programs, and will monitor the need for additional demand side resources through its Integrated Resource Planning Process.

V. CPA SERVICE TERRITORY DESCRIPTION AND MAP

A description of CPA's service territory and map are attached.

COLUMBIA OF PENNSYLVANIA, INC.
Annual Resource Planning Summary Report

List of Tables

DESCRIPTION OF TERRITORY

ADAMS COUNTY

Abbottstown
Arendtsville
Aspers
Bendersville
Berwick Township
Biglerville
Butler Township
Caledonia
Cashtown
Conewago Township*
Cumberland Township
East Berlin
Fairfield
Fayetteville
Franklin Township
Freedom Township
Germany Township
Gettysburg
Hamilton Township
Hamiltonban Township
Hemptom
Littlestown
McSherrystown*
Menallen Township
Mt. Joy Township
Mt. Pleasant Township
New Oxford
Oxford Township
Reading Township
Strabane Township
Table Rock
Two Taverns
Tyrone Township
Union Township

ALLEGHENY COUNTY

The Company is certified to serve in all cities, boroughs and townships in Allegheny County.

ARMSTRONG COUNTY

Distant
Hovey Township
Madison Township
Mahoning Township
McWilliams
New Salem
Oakland
Oak Ridge
Parker City
Perry Township
Red Bank Township
South Bethlehem

BEAVER COUNTY

The Company is certified in serve in all cities, boroughs and townships in Beaver County.

BEDFORD COUNTY

Cumberland Valley Township
Londonderry Township
Mann Township
Southampton Township
State Line

BUTLER COUNTY

Adams Township
Allegheny Township
Annandale
Annisville
Brady Township
Bruin
Center Township
Cherry Township
Clay Township
Concord Township
Cranberry Township

BUTLER COUNTY (continued)

Criders Corners
Deegan
Eau Claire
Fairview
Fairview Township
Fallowfield Township
Forestville
Franklin Township
Harrisville
Karns City **
Marion Township
Mercer Township
Muddy Creek Township
North Washington
Parker Township
Slippery Rock Township
Valencia
Valencia Township
Venango Township (C)
Washington Township
West Liberty
Wick
Worth Township

CENTRE COUNTY ***

Bellefonte
Benner Township
Boggs Township
Burnside Township
College Township
Ferguson Township
Harris Township
Patton Township
Potter Township
Snow Shoe Township
Spring Township
State College
Union Township

* Territory formerly served under Tariff Gas-Pa. P.U.C. No. 7.
** Limited to industrial service to Permanent Service Identification (PSID) 400473084.
*** Territory formerly served under Tariff Gas-Pa. P.U.C. No. 6.

(C) Indicates Change

DESCRIPTION OF TERRITORY (Continued)

CHESTER COUNTY

Coatesville*

CLARION COUNTY

Ashland Township
Beaver Township
Callensburg
Climax
Dutch Hill
Elk City
Elk Township
Fairmont City
Foxburg
Hawthorne
Huey
Knox
Lamartine
Lawsonham
Leatherwood
Licking Township
Madison Township
Mayport
Monroe
New Bethlehem
Perry township
Perryville
Porter Township
Red Bank Township
Richland Township
Rimersburg
Salem
Salem Township
Shippenville
St. Petersburg
Toby Township
Turkey City
Turnip Hole
Wentlings
West Freedom
West Monterey

CLEARFIELD COUNTY

Burnside Township
Jordon Township**
Union Township

ELK COUNTY

Highland Township
Nansen
Russell city

FAYETTE COUNTY

The Company is certified to serve in all cities, boroughs and townships in Fayette County.

FRANKLIN COUNTY

Antrim Township
Caledonia
Greencastle
Greene Township
Guilford Township
Mercersburg
Mont Alto
Montgomery Township
Nunnery
Peters Township
Quincy
Quincy Township
Shady Grove
Washington Township
Waynesboro

FULTON COUNTY

Bethel Township
Thompson Township
Union Township

GREENE COUNTY

The Company is certified to serve in all cities, boroughs and townships in Greene County. (C)

INDIANA COUNTY

Center Township***
Cherryhill Township**
Clymer
White Township***

JEFFERSON COUNTY

Beaver Township
Clover Township
Heath Township
Iowa
Knox Township
Pine Creek Township
Polk Township
Ringgold Township
Rose Township
Summerville
Union Township
Warsaw Township
Winslow Township

* Limited to industrial service to Permanent Service Identification (PSID) 400495160. (C)
** Limited to industrial service to Permanent Service Identification (PSID) 500254711 and 500254712. (C)
*** Limited to service to customers located within the industrial park owned by Indiana County Industrial Development Authority and Indiana County Development Corporation.

(C) Indicates Change

DESCRIPTION OF TERRITORY (Continued)

LAWRENCE COUNTY

Bessemer
Big Beaver Township
Chewton
Ellport
Ellwood City
Energy
Harlansburg
Hickory Township
Joyce
Little Beaver Township
Mt. Jackson
(C) Neshannock Township
New Castle
North Beaver Township
Perry Township
Princeton
Scott Township
Shenango Township
Slippery Rock Township
South New Castle
Taylor Township
Union Township
Wampum
Wayne Township
Wurtemburg

McKEAN COUNTY

Bradford
Bradford Township
Custer City
Dallas City
Degolia
Derrick City
Foster Brook
Foster Township
Lafayette Township
Lewis Run
Mt. Alton
Tune

MERCER COUNTY

Liberty Township
North Liberty

SOMERSET COUNTY

Addison Township
Berlin
Brothers Valley Township
Elk Lick Township
Greenville Township
Meyersdale
Salisbury
Somerset
Somerset Township
Southampton Township
Summit Township

VENANGO COUNTY

Clintonville
Clinton Township
Dotter
Emlenton
Freedom
Irwin Township
Mariasville
Nickleville
Pittsville
Richland Township
Rockland Township
Scrubgrass Township

WARREN COUNTY

Conewango Township
Glade Township
Mead Township
Pleasant Township
Russell
Shefield Township
Starbrick
Warren

WASHINGTON COUNTY

The Company is certified to serve in all cities, boroughs and townships in Washington County.

WESTMORELAND COUNTY

Alverton
Ardara
Buzzardtown
Cereal
Circleville
Coal Hollow
Collinsburg
Cowansburg
East Huntingdon Township
Eldora
Fellsburg
Fells Chapel
Foxtone
Grapeville
Gratztown
Hahntown
Hempfield Township
Herminie
Irwin
Jeannette
Lowber
Madison
Marchland
Monessen
Mt. Pleasant
Mt. Pleasant Township
North Huntington Township
Penglyn
Penn
Penn Township
Rilton
Rostrover Township
Ruffsdale
Rural (Scottdale)
Scottdale
Sewickley Township
Shafton
Smithton
South Huntingdon Township
Stewartsville
Straw Pump
Sutersville
Tarr
Unity Township
West Newton
Youngwood

(C) Indicates Change

DESCRIPTION OF TERRITORY (Continued)

YORK COUNTY *

Carroll Township
Codorus Township**
Conewago Township
Dallastown
Dillsburg
Dover
Dover Township
East Hopewell Township
East Manchester Township
East Prospect
Fawn Township
Glen Rock
Hallam
Hallam Township
Hanover
Hopewell Township
Jackson Township
Jacobus
Jefferson
Loganville
Lower Chancefore Township
Lower Windsor Township
Manchester
Manchester Township
Manheim Township
Mount Wolf
Newberry Township
New Freedom
North Codorus Township
North York
Paradise Township
Penn Township
Railroad
Red Lion
Seven Valleys
Shrewsburg
Shrewsburg Township
Springettsbury Township
Springfield Township
Spring Garden Township
Spring Grove
Stewartstown

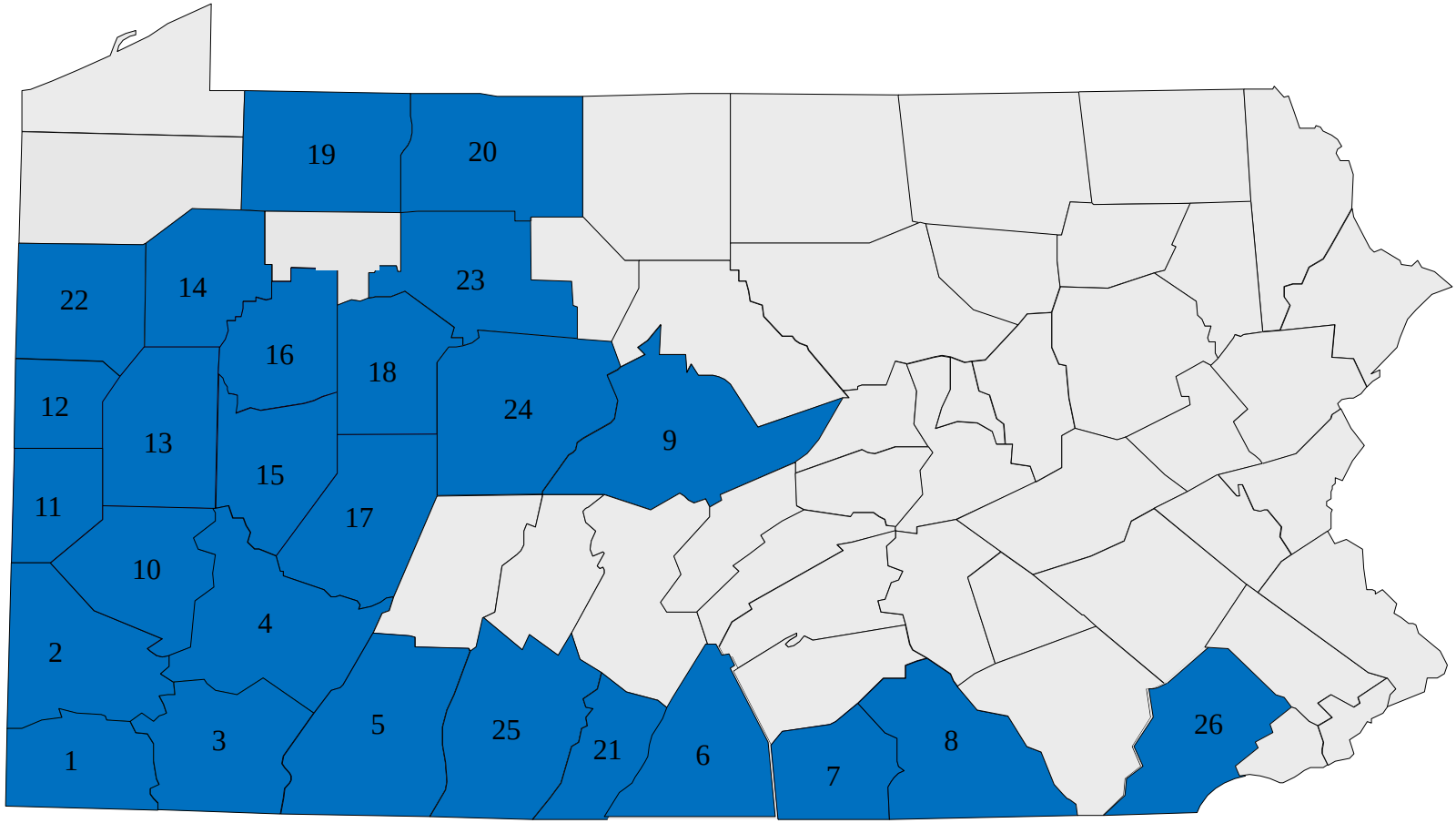
YORK COUNTY (continued)

Warrington Township
Washington Township
Wellsville
West Manchester Township
West Manheim Township
West York
Windsor
Windsor Township
Wrightsville
Yoe
York
Yorkana
York Haven
York New Salem
York Township

* Territory formerly served under Tariff Gas – Pa. P.U.C. No. 7 with the exception of Codorus and Manheim Townships and portions of East Manchester, Hallam, Manchester and Penn Townships.

** Limited to industrial service to Permanent Service Identification (PSID) 400472432. (C)

(C) Indicates Change



1 = Greene
2 = Washington
3 = Fayette
4 = Westmoreland
5 = Somerset
6 = Franklin
7 = Adams
8 = York
9 = Centre
10 = Allegheny
11 = Beaver
12 = Lawrence
13 = Butler
14 = Venango
15 = Armstrong
16 = Clarion
17 = Indiana
18 = Jefferson
19 = Warren
20 = McKean
21 = Fulton
22 = Mercer
23 = Elk
24 = Clearfield
25 = Bedford
26 = Chester

FORM-IRP-GAS-1A: ANNUAL GAS REQUIREMENTS
REPORTING UTILITY: COLUMBIA GAS OF PENNSYLVANIA, INC.
(volumes In Mmcf)

	Historical Data		Current Year	Three Year Forecast		
Index Year	-2	-1	0	1	2	3
Actual Year	2020	2021	2022	2023	2024	2025
Firm Sales						
Retail Residential	25,753	26,996	29,066	29,603	30,189	30,652
Retail Commercial	7,310	8,076	8,493	8,524	8,611	8,654
Retail Industrial	175	173	182	187	188	188
Electric Power Generation						
Exchanges with Other Utilities						
Unaccounted for Gas	(187)	2	647	656	668	678
Company Use	109	129	109	109	109	109
Subtotal Firm Sales	33,160	35,376	38,498	39,079	39,765	40,281
Interruptible Sales						
Retail	0	0	0	0	0	0
Electric Power Generation	0	0	0	0	0	0
Company's Own Plant						
Subtotal Interruptible Sales	0	0	0	0	0	0
SUBTOTAL FIRM AND INTERRUPTIBLE SALES:	33,160	35,376	38,498	39,079	39,765	40,281
Transportation						
Firm Residential	4,844	4,208	4,213	3,851	3,501	3,127
Firm Commercial	2,730	2,706	2,888	2,898	2,928	2,941
Firm Industrial						
Interruptible Residential						
Interruptible Commercial	11,442	10,836	11,797	11,841	11,987	12,051
Interruptible Industrial	19,976	21,743	21,738	22,218	22,400	22,381
Electric Power Generation	63	457	430	430	430	430
Subtotal Transportation	39,055	39,949	41,065	41,239	41,246	40,931
TOTAL GAS REQUIREMENTS	72,215	75,325	79,563	80,318	81,012	81,211
Increase (Decrease)		3,110	4,238	755	694	200
Percent Change (%)		4.3	5.6	0.9	0.9	0.2

FORM-IRP-GAS-1B: PEAK DAY REQUIREMENTS
REPORTING UTILITY: COLUMBIA GAS OF PENNSYLVANIA, INC.
(volumes In Mmcf)

	Historical Data		Current Year	Three Year Forecast		
Index Year	-2	-1	0	1	2	3
Actual Year	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
Firm Sales						
Retail Residential	216.6	225.8	205.6	331.1	338.7	346.6
Retail Commercial	77.3	74.5	73.4	115.2	115.6	115.8
Retail Industrial	0.4	0.9	0.7	1.1	1.1	1.1
Electric Power Generation	0.0	0.0	0.0	0.0	0.0	0.0
Exchanges with Other Utilities	0.0	0.0	0.0	0.0	0.0	0.0
Unaccounted for Gas	1.5	1.7	1.8	1.8	1.8	1.8
Company Use	0.5	0.7	0.6	0.6	0.6	0.6
Other	0.0	0.0	0.0	0.0	0.0	0.0
Subtotal Firm Sales	296.3	303.6	282.1	449.8	457.8	465.9
Interruptible Sales						
Retail	0.0	0.0	0.0	0.0	0.0	0.0
Electric Power Generation	0.0	0.0	0.0	0.0	0.0	0.0
Company's Own Plant	0.0	0.0	0.0	0.0	0.0	0.0
Subtotal Interruptible Sales	0.0	0.0	0.0	0.0	0.0	0.0
SUBTOTAL FIRM AND INTERRUPTIBLE SALES:	296.3	303.6	282.1	449.8	457.8	465.9
Transportation						
Firm Residential	67.9	66.3	67.9	100.0	94.0	87.7
Firm Commercial	24.8	23.7	29.1	45.7	46.0	46.3
Firm Industrial	0.0	0.0	0.0	0.0	0.0	0.0
Interruptible Residential	0.0	0.0	0.0	0.0	0.0	0.0
Interruptible Commercial	64.6	61.5	59.6	95.4	96.7	98.2
Interruptible Industrial	55.3	52.5	55.5	90.5	89.8	88.1
Electric Power Generation	2.7	2.7	2.7	2.7	2.7	2.7
Subtotal Transportation	215.3	206.7	214.8	334.3	329.2	323.0
TOTAL GAS REQUIREMENTS	511.6	510.3	496.9	784.1	787.0	788.9
Increase (Decrease)		(1.3)	(13.4)	287.2	2.9	1.9
Percent Change (%)		-0.25%	-2.63%	57.80%	0.37%	0.24%

Note: Firm volumes shown excludes CPA's firm obligations under its Standby Sales and Elective Balancing Services.

FORM-IRP-GAS-2A: NATURAL GAS SUPPLY
TABLE 1: ANNUAL SUPPLY
REPORTING UTILITY: COLUMBIA GAS OF PENNSYLVANIA, INC.
(volumes In Mmcf)

	Historical Data		Current Year	Three Year Forecast		
Index Year	-2	-1	0	1	2	3
Actual Year	2020	2021	2022	2023	2024	2025
Gas Supply for Sales Service						
Supplier A	489.7	6,793.8	2,375.5			
Supplier B	913.5	1,817.5	447.4			
Supplier C	355.2	4,139.6	0.0			
Supplier D	9,606.8	3,983.3	0.0			
Supplier E	3,253.2	3,544.1	0.0			
Supplier F	233.4	2,755.4	0.0			
Supplier G	1,790.9	2,571.4	0.0			
Supplier H	713.1	2,054.5	0.0			
Spot Purchases	14,839.8	10,530.0	33,179.7	39,144.5	40,294.4	40,315.8
Storage Withdrawals	19,690.3	18,971.1	24,444.9	23,616.5	23,161.8	23,605.0
LNG/SNG/Propane Purchases						
Company Production						
Local Purchases	244.0	243.0	244.2	244.2	244.9	244.2
Exchanges						
Other						
Total Gas Supply for Sales	52,129.8	57,403.7	60,691.7	63,005.3	63,701.2	64,165.0
Total Transportation Service	39,055.0	39,949.1	41,065.2	41,238.6	41,246.2	40,930.6
TOTAL SALES, GAS SUPPLY AND TRANSPORTATION SERVICE	91,184.9	97,352.8	101,756.9	104,243.9	104,947.4	105,095.7
Deductions						
Curtailments						
Underground Storage Injections	18,970.3	22,027.7	22,193.7	23,926.3	23,935.2	23,884.0
LNG Liquefaction						
Sales to other LDCs						
Off-System Sales						
Total Deductions	18,970.3	22,027.7	22,193.7	23,926.3	23,935.2	23,884.0
NET GAS SUPPLY	72,214.6	75,325.1	79,563.2	80,317.6	81,012.2	81,211.7

FORM-IRP-GAS-2A: NATURAL GAS SUPPLY
TABLE 2: PEAK DAY SUPPLY
REPORTING UTILITY: COLUMBIA GAS OF PENNSYLVANIA, INC.
(volumes In Mmcf)

	Historical Data		Current Year	Three Year Forecast		
Index Year	-2	-1	0	1	2	3
Actual Year	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
Gas Supply for Sales Service						
Columbia Gas Transmission 1/	52.3	33.8	31.3	69.2	72.4	0.1
Tennessee	18.4	18.4	18.4	18.4	18.4	18.4
Texas Eastern	18.4	18.4	19.6	19.6	19.6	19.6
National Fuel	4.0	4.0	5.6	5.6	5.6	5.6
Dominion Transmission	4.2	4.4	4.5	5.0	5.0	5.0
Equitrans Transmission	0.0	18.0	18.0	18.0	18.0	18.0
Spot Purchases	0.0	0.0	0.0	0.0	0.0	0.0
Storage Withdrawals	198.3	206.0	184.0	313.4	318.1	398.5
LNG/SNG/Propane Purchases	0.0	0.0	0.0	0.0	0.0	0.0
Company Production	0.0	0.0	0.0	0.0	0.0	0.0
Local Purchases	0.7	0.7	0.7	0.7	0.7	0.7
Exchanges with other LDCs	0.0	0.0	0.0	0.0	0.0	0.0
Other	0.0	0.0	0.0	0.0	0.0	0.0
Total Gas Supply for Sales	296.3	303.6	282.1	449.8	457.8	465.9
Total Transportation Service 2/	215.3	206.7	214.8	334.3	329.2	323.0
TOTAL SALES, GAS SUPPLY AND TRANSPORTATION SERVICE	511.6	510.3	496.9	784.1	787.0	788.9
Deductions						
Curtailments	0.0	0.0	0.0	0.0	0.0	0.0
Underground Storage Injections	0.0	0.0	0.0	0.0	0.0	0.0
LNG Liquefaction	0.0	0.0	0.0	0.0	0.0	0.0
Sales to other LDCs	0.0	0.0	0.0	0.0	0.0	0.0
Total Deductions	0.0	0.0	0.0	0.0	0.0	0.0
NET GAS SUPPLY	511.6	510.3	496.9	784.1	787.0	788.9

1/ Excludes capacity offered to Choice marketers

2/ Total Transportation Service includes "Choice" balancing provided by CPA storage withdrawals.

FORM-IRP-GAS-2B: NATURAL GAS TRANSPORTATION [1]
REPORTING UTILITY: COLUMBIA GAS OF PENNSYLVANIA, INC.
(volumes In Mmcf)

	Historical Data				Current Year		Three Year Forecast					
Index Year	-2		-1		0		1		2		3	
Actual Year	2020		2021		2022		2023		2024		2025	
City Gate Transportation Contracts:	Annual	Peak	Annual	Peak	Annual	Peak	Annual	Peak	Annual	Peak	Annual	Peak
Columbia Gas Transmission Corporation	29,856.7	81.6	19,307.6	52.9	19,307.6	52.9	19,307.6	52.9	19,360.5	52.9	19,307.6	52.9
Columbia Gas Transmission Corporation					13,740.3	37.6	13,777.9	37.6	13,777.9	37.6	13,740.3	37.6
Equitrans Pipeline Company			6,584.0	18.0	6,584.0	18.0	6,584.0	18.0	6,602.1	18.0	6,584.0	18.0
Equitrans Pipeline Company			5,931.6	16.3	5,931.6	16.3	5,931.6	16.3	5,947.8	16.3	5,931.6	16.3
Columbia Gas Transmission Corporation	4,652.3	12.7	4,652.4	12.7	4,652.4	12.7	4,652.4	12.7	4,665.2	12.7	4,652.4	12.7
Texas Eastern Pipeline Co.	4,100.7	11.2	4,100.8	11.2	4,100.8	11.2	4,100.8	11.2	4,112.0	11.2	4,100.8	11.2
Tennessee Gas Pipeline Co.	4,080.8	11.1	4,080.9	11.2	4,080.9	11.2	4,080.9	11.2	4,092.1	11.2	4,080.9	11.2
Columbia Gas Transmission Corporation	4,070.3	11.1	4,070.4	11.2	4,070.4	11.2	4,070.4	11.2	4,081.6	11.2	4,070.4	11.2
Columbia Gas Transmission Corporation	3,489.0	9.5	3,489.2	9.6	3,489.2	9.6	3,489.2	9.6	3,498.7	9.6	3,489.2	9.6
Tennessee Gas Pipeline Co.	2,651.7	7.2	2,651.8	7.3	2,651.8	7.3	2,651.8	7.3	2,659.0	7.3	2,651.8	7.3
Texas Eastern Pipeline Co.	2,616.8	7.1	2,616.9	7.2	2,616.9	7.2	2,616.9	7.2	2,624.0	7.2	2,616.9	7.2
Dominion Transmission	1,744.5	4.8	1,744.6	4.8	1,744.6	4.8	1,744.6	4.8	1,749.4	4.8	1,744.6	4.8
National Fuel Gas Supply	1,501.7	4.1	1,501.7	4.1	1,501.7	4.1	1,501.7	4.1	1,505.8	4.1	1,501.7	4.1
National Fuel Gas Supply			548.1	1.5	548.1	1.5	548.1	1.5	549.6	1.5	548.1	1.5
Texas Eastern Pipeline Co.					418.7	1.1	418.7	1.1	419.8	1.1	418.7	1.1
Dominion Transmission			89.0	0.2	89.0	0.2	89.0	0.2	89.2	0.2	89.0	0.2
Texas Eastern Pipeline Co.			34.9	0.1	34.9	0.1	34.9	0.1	35.0	0.1	34.9	0.1
TOTAL	58,764.5	160.6	61,279.9	167.9	75,438.9	206.7	75,476.6	206.7	75,645.6	206.7	75,438.9	206.7
Upstream Transportation Contracts:												
Tennessee Gas Pipeline	1,501.7	4.1	1,501.7	4.1	1,501.7	4.1	1,501.7	4.1	1,501.7	4.1	1,505.8	4.1
Texas Eastern Pipeline Co.	1,075.3	2.9	1,075.4	2.9	1,075.4	2.9	1,075.4	2.9	1,075.4	2.9	1,078.3	2.9
TOTAL	2,577.0	7.0	2,577.1	7.1	2,577.1	7.1	2,577.1	7.1	2,577.1	7.1	2,584.1	7.1
Storage-Related Transportation Contracts:												
Columbia Gas Transmission Corp.	119,554.3	435.5	115,448.8	422.1	103,458.3	378.3	103,458.3	378.3	103,458.3	378.3	103,836.6	378.3
Dominion Transmission	2,173.5	14.3	2,165.2	14.3	2,165.2	14.3	2,165.2	14.3	2,165.2	14.3	2,179.5	14.3
Equitrans Pipeline Company						18.3	2,761.3	18.3	2,761.3	18.3	2,779.6	18.3
Equitrans Pipeline Company	1,429.9	13.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dominion Transmission	869.4	5.7	866.1	5.7	866.1	5.7	866.1	5.7	866.1	5.7	871.8	5.7
Dominion Transmission	695.5	4.6	692.9	4.6	692.9	4.6	692.9	4.6	692.9	4.6	697.4	4.6
Dominion Transmission					433.0	2.9	433.0	2.9	433.0	2.9	435.9	2.9
National Fuel					350.6	2.3	350.6	2.3	350.6	2.3	352.9	2.3
Dominion Transmission	434.7	2.9	433.0	2.9	433.0	2.9	433.0	2.9	433.0	2.9	435.9	2.9
TOTAL	125,157.4	476.7	119,606.0	449.6	108,399.2	429.3	111,160.5	429.3	111,160.5	429.3	111,589.8	429.3

1 Rank contracts in order of magnitude for the current year, noting the transportation provider and termination date for each contract reported.
Reporting should proceed along rank ordering until 75% of total is accounted for, or until ten contracts have been listed, whichever occurs first.

FORM-IRP-GAS-2B: NATURAL GAS TRANSPORTATION
REPORTING UTILITY: COLUMBIA GAS OF PENNSYLVANIA, INC.
(volumes In Mmcf)

	Contract Expiration Date
City Gate Transportation Contracts:	
Columbia Gas Transmission Corporation	10/31/22
Equitrans Pipeline Company	03/31/25
Equitrans Pipeline Company	03/31/25
Columbia Gas Transmission Corporation	10/31/26
Texas Eastern Pipeline Co.	10/31/22
Tennessee Gas Pipeline Co.	10/31/24
Columbia Gas Transmission Corporation	10/31/22
Columbia Gas Transmission Corporation	10/31/26
Tennessee Gas Pipeline Co.	10/31/26
Texas Eastern Pipeline Co.	10/31/26
Dominion Transmission	03/31/30
National Fuel Gas Supply	10/31/22
Columbia Gas Transmission Corporation	03/31/30
Upstream Transportation Contracts:	
Columbia Gulf Transmission Corp.	01/00/00
Tennessee Gas Pipeline	10/31/24
Texas Eastern Pipeline Co.	10/31/22
Storage-Related Transportation Contracts:	
Columbia Gas Transmission Corp.	03/31/22
Dominion Transmission	03/31/30
Equitrans Pipeline Company	03/31/25
Equitrans Pipeline Company	03/31/20
Dominion Transmission	03/31/28
Dominion Transmission	03/31/24
Dominion Transmission	01/00/00

FORM-IRP-GAS-2C: NATURAL GAS STORAGE [1]
REPORTING UTILITY: COLUMBIA GAS OF PENNSYLVANIA, INC.
(volumes In Mmcf)

	Historical Data				Current Year		Three Year Forecast					
Index Year	-2		-1		0		1		2		3	
Actual Year	2020		2021		2022		2023		2024		2025	
	Annual	Peak	Annual	Peak	Annual	Peak	Annual	Peak	Annual	Peak	Annual	Peak
Columbia Gas Transmission Corporation	24,157.4	435.5	24,224.4	422.1	23,413.1	378.3	23,413.1	378.3	23,413.1	378.3	23,413.1	378.3
Equitrans Pipeline Company					1,911.9	18.3	1,911.9	18.3	1,911.9	18.3	1,911.9	18.3
Equitrans Pipeline Company	1,429.9	13.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dominion Transmission	897.2	8.6	899.7	8.6	899.7	8.6	899.7	8.6	899.7	8.6	899.7	8.6
Dominion Transmission	886.6	14.3	889.0	14.3	889.0	14.3	889.0	14.3	889.0	14.3	889.0	14.3
Dominion Transmission	228.8	4.6	229.4	4.6	229.4	4.6	229.4	2.3	229.4	4.6	229.4	4.6
National Fuel					255.4	2.3	255.4	2.9	255.4	2.3	255.4	2.3
TOTAL	27,599.9	476.7	26,242.5	449.6	27,598.5	426.4	27,598.5	424.7	27,598.5	426.4	27,598.5	426.4

1 Rank contracts in order of magnitude for the current year, noting the transportation provider and termination date for each contract reported. Reporting should proceed along rank ordering until 75% of total is accounted for, or until ten contracts have been listed, whichever occurs first.

	Contract Expiration Date
Columbia Gas Transmission Corporation	03/31/22
Equitrans Pipeline Company	03/31/25
Equitrans Pipeline Company	03/31/20
Dominion Transmission	03/31/28
Dominion Transmission	03/31/30
Dominion Transmission	03/31/24

FORM-IRP-GAS-3: NUMBER OF CUSTOMERS (YEAR END)
REPORTING UTILITY: COLUMBIA GAS OF PENNSYLVANIA, INC.

	Historical Data		Current Year	Three Year Forecast		
Index Year	-2	-1	0	1	2	3
Actual Year	2020	2021	2022	2023	2024	2025
Firm Sales						
Retail Residential	322,930	353,598	361,118	366,470	372,485	377,946
Retail Commercial	25,355	25,992	25,949	25,995	26,034	26,068
Retail Industrial	71	75	70	70	70	70
Other	0	0	0	0	0	0
Subtotal Sales Service	348,356	379,665	387,137	392,535	398,589	404,084
Electric Power Generation	2	3	2	1	2	2
Transportation Service	92,295	63,020	58,950	54,930	50,910	46,890
CUSTOMER TOTAL	440,653	442,688	446,089	447,466	449,501	450,976
Increase (Decrease)	4,056	2,035	3,401	1,377	2,035	1,475
Percent Change (%)	0.009	0.005	0.008	0.003	0.005	0.003

Note: In 2021, CAP customers were included in Retail Residential, instead of Transportation as there was no CAP supplier. The forecast assumes that CAP customers will be included in Sales for the years 2022-2025.

FORM-IRP-GAS-4A: ANNUAL SUPPLY AND REQUIREMENTS SUMMARY
REPORTING UTILITY: COLUMBIA GAS OF PENNSYLVANIA, INC.
(volumes in Mmcf)

	Historical Data		Current Year	Three Year Forecast		
Index Year	-2	-1	0	1	2	3
Actual Year	2020	2021	2022	2023	2024	225
Gas Supply:						
Supply Contracts	18,320.0	24,846.0	38,498.0	39,080.0	39,766.0	40,281.0
Spot Purchases	14,839.8	10,530.0				
Subtotal Gas Supply	33,159.8	35,376.0	38,498.0	39,080.0	39,766.0	40,281.0
Transportation	39,055.0	39,949.1	41,065.2	41,238.6	41,246.2	40,930.6
TOTAL GAS SUPPLY	72,214.8	75,325.0	79,563.2	80,318.6	81,012.2	81,211.6
Requirements:						
Firm Requirements	33,159.8	35,376.0	38,498.0	39,080.0	39,766.0	40,281.0
Interruptible Requirements	0.0	0.0	0.0	0.0	0.0	0.0
Subtotal Firm & Interruptible	33,159.8	35,376.0	38,498.0	39,080.0	39,766.0	40,281.0
Transportation	39,055.0	39,949.1	41,065.2	41,238.6	41,246.2	40,930.6
Load Reductions						
TOTAL GAS REQUIREMENTS	72,214.8	75,325.0	79,563.2	80,318.6	81,012.2	81,211.6
Surplus (Deficiency)	0.0	0.0	0.0	0.0	0.0	0.0

FORM-IRP-GAS-4B PEAK DAY SUPPLY AND REQUIREMENTS SUMMARY
REPORTING UTILITY: COLUMBIA GAS OF PENNSYLVANIA, INC.
(volumes in Mmcf)

	Historical Data		Current Year	Three Year Forecast		
Index Year	-2	-1	0	1	2	3
Actual Year	2020	2021	2022	2023	2024	2025
Gas Supply:						
Supply Contracts	296.3	303.6	282.1	449.8	457.8	465.9
Spot Purchases	0.0	0.0	0.0	0.0	0.0	0.0
Subtotal Gas Supply	296.3	303.6	282.1	449.8	457.8	465.9
Transportation	215.3	206.7	214.8	334.3	329.2	323.0
TOTAL GAS SUPPLY	511.6	510.3	496.9	784.1	787.0	788.9
Requirements:						
Firm Requirements	296.3	303.6	282.1	449.8	457.8	465.9
Interruptible Requirements	0.0	0.0	0.0	0.0	0.0	0.0
Subtotal Firm & Interruptible	296.3	303.6	282.1	449.8	457.8	465.9
Transportation	215.3	206.7	214.8	334.3	329.2	323.0
Load Reductions	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL GAS REQUIREMENTS	511.6	510.3	496.9	784.1	787.0	788.9
Surplus (Deficiency)	0.0	0.0	0.0	0.0	0.0	0.0

FORM-IRP-GAS-5 PROGRAM DESCRIPTION

Company: Columbia Gas of Pennsylvania, Inc.

Program: **WarmWise Low Income Usage Reduction Program (WWLIURP)**

Existing [X] Proposed [ ]

Contact Person: Deborah Davis
724-416-6316

Objective: To reduce the uncollectible accounts and the collection and termination expenses by enabling low-income customers to reduce their energy usage.

Details of Activity and Implementation Schedule:

Eligible customers are targeted for involvement in the program. For each participating household, Columbia will perform a detailed energy survey, an in-the-home customer education session, and comprehensive weatherization treatments (e.g., insulation and air leakage measures).

Actual and/or Anticipated Results:

	Peak Load	Energy Savings			
	Reduction	Electric	Gas	Oil	Other
Year	Mcf	Mwh	Mcf	Gallons	Results
2021[1)]	67	0	9916	0	307 Homes Weatherized
2022[(2)]	159	0	25,581	0	792 Homes Projected

Monetary and Personnel Resources:

		Categorized Program Expenses		
Year	Personnel Est. Hrs. [(3)]	Outside Services	Admin.	Total
2021[(1)]	12,280	$3,159,697	$303,411	$3,463,108
2022[(2)]	31,680	$8,332,244	$600,000.	$8,932,244

(1) Peak and energy savings are calculated based upon the weather efficiency measures taken at the weatherized homes.
(2) Budgeted
(3) Personnel hours were estimated by multiplying the number of homes by 40, the average number of hours spent per house.

FORM-IRP-GAS-5 PROGRAM DESCRIPTION

Company: Columbia Gas of Pennsylvania, Inc.

Program: **Emergency Repair Fund Program**

Existing [X] Proposed [ ]

Contact Person: Deborah Davis
724-416-6316

Objective: To reduce the energy burden of low-income customers by providing a furnace repair and replacement program.

Details of Activity and Implementation Schedule:

This fund is utilized to assist low-income property owners to maintain gas service and reduce usage due to inefficient equipment.

Actual and/or Anticipated Results:

Year	Peak Load Reduction[3] Mcf	Energy Savings[3] Electric Mwh	Gas Mcf	Oil Gallons	Other Results
2021[1]	---				235 Services Provided
2022[2]	---				269 Services Projected

Monetary and Personnel Resources:

Year	Personnel Est. Hrs.	Categorized Program Expenses Outside Services	Admin	Total
2021[1]	940	$533,748	$59,638	$596,386
2022[2]	1077	$630,000	$70,000	$700,000

(1) Actual
(2) Budgeted
(3) No savings estimates have been developed.

FORM-IRP-GAS-5 PROGRAM DESCRIPTION

Company: Columbia Gas of Pennsylvania, Inc.

Program: **Customer Assistance Program**

Existing [X] Proposed [ ]

Contact Person: Deborah Davis
724-416-6316

Objective: To reduce the growth in uncollectible account balances and the collection and termination expenses associated with accounts in arrears by providing low-income customers with affordable payment plans and conservation education.

Details of Activity and Implementation Schedule:

Eligible customers are those at or below 150% of poverty (income of $37,650 for a family of four); a failed budget plus customer; and payment troubled. For each participant, an affordable payment will be established based on the base budget, household size and household income.

Actual and/or Anticipated Results:

Year	Peak Load Reduction[3] Mcf	Energy Savings[3] Electric Mwh	Gas Mcf	Oil Gallons	Other Results
2021[1]	---		---		28,427 Customers
2022[2]	---		---		31,000 Customers

Monetary and Personnel Resources:

Year	Personnel Est. Hrs.	Outside Services	Admin.	Shortfall[4]	Pre-Program Arrearages [5]	Total
2021[1]	N/A	$722,874	$28,388	$20,023,299	$3,284,454	$24,059,015
2022[2]	N/A	$1,250,000	$50,000	$20,442,928	$975,247	$22,718,175

(1) Actuals reflect results at December 31, 2021.
(2) Budgeted
(3) No savings estimates have been developed.
(4) “Shortfall” is the difference between the CAP customers’ discounted bills and what the bills would have been if they were billed under standard residential rates. This amount is being recovered under Columbia’s Rider USP.
(5) Pre-program arrearages are the amounts written off upon the customer’s enrollment in CAP.

FORM-IRP-GAS-5 PROGRAM DESCRIPTION

Company: Columbia Gas of Pennsylvania, Inc.

Program: **WarmWise Audits and Rebates (WWA&R)**

Existing [x] Proposed [ ]

Contact Person: Deb Davis
724-416-6316

Objective: To provide home energy-audits and an energy efficiency plan with financial incentives for customer who may not qualify for other consumption reduction programs.

Details of Activity and Implementation Schedule:

Income eligible customers are targeted for involvement in the program. Columbia will perform a BPI audit, an in-the-home customer education session, and financial incentives for the installation of recommended measures.

Actual and/or Anticipated Results:

	Peak Load Reduction (1)	Energy Savings			
Year	Mcf	Electric Mwh	Gas MCF(1)	Oil Gallons	Other Results
2021	32		4654		176 Participants
2022	51		8277		313 Participants Projected

Monetary and Personnel Resources:

		Categorized Program Expenses		
Year	Personnel Est. Hrs. (3)	Outside Services(4)	Admin.	Total
2021	880	$350,630	$120,156	$470,785
2022	1565	$620,000	$130,000	$750,000

(1) These results are based off 12 months data (2021)
(2) Personnel hours were estimated by multiplying the number of home completed by 5 hours, the average time to serve a customer in the home.
(3) Outside services includes customer audit costs and rebates for audit recommended installed measures and external administrative costs.

FORM-IRP-GAS-6 ENERGY USERS

Company: Columbia Gas of Pennsylvania, Inc.

Energy Users	Number of Customers (Year-end)	Annual Energy Consumption * (MCF)	Conservation Impact Reduction or MCF savings Target	Actual
Residential (Heating)	353,598	27,531,929	7,787	3,351
Residential (Other)	0	0		
Small Com. & Ind.	25,992	8,264,439		
Large Com. & Ind.	75	173,813		
Street Lighting	0	0		
Railroads	0	0		
Resale	0	0		
Interruptible	0	0		
Interdepartmental	0	0		
Other-Electric Power	0	0		
Other - Transportation	63,020	39,918,632	26,071	11,219
Other - Misc	0	0		
TOTALS	442,685	75,888,812	33,858	14,570

* Previous calendar year (2021).
** Approximately 77% of WWLIURP customers are transportation (CHOICE) customers.

FORM-IRP-GAS-7 PROGRAM SUMMARY

Company: Columbia Gas of Pennsylvania, Inc.

Program Name 2022 (1)	Peak Load Reduction (MCF)	Energy Use Change (MCF)	Personnel Est. Hrs.	Categorized Program Expenses Outside Services	Admin.	Total
WarmWise Low Income Usage Reduction Program (WWLIURP)	159	25,581	31,680	8,332,244	600,000	8,932,244
Emergency Repair Program	NA	NA	1,077	630,000	70,000	700,000
Customer Assistance Program	NA	NA	NA	1,250,000	50,000	1,300,000
WarmWise Audits & Rebates (WWA&R)	51	8,277	1,565	620,000	130,000	750,000
Totals	210	33,858	34,322	$10,832,244	$850,000	$11,682,244

(1) Budgeted

Company Name:

COLUMBIA GAS OF PENNSYLVANIA, INC.

FORM-IRP-GAS-8

COST-BENEFIT ANALYSIS INPUTS

PROGRAM: WarmWise Low Income Usage Reduction Program (WWLIURP)

t	N YEAR	ENERGY SAVINGS (1) (E) MCF	AVERAGE ENERGY COST (2) (ACE) $ PER MCF	AVOIDED ENERGY COST (3) (MCE) $ PER MCF	PARTICIPANT DEMAND SAVINGS (4) (D) MCF	UTILITY CAPACITY SAVINGS (G) MCF	AVERAGE DEMAND COSTS (ACD) $/MCF	AVOIDED DEMAND COSTS (MCD) $/MCF	PARTICIPANT COSTS (PC) $	TAX CREDITS (TC) $
1	2022	25,581	18.19	3.30	.20075757575	159	N/A	135.01	0	N/A
2	2023	25,581	17.71	2.83	.20075757575	159	N/A	134.21	0	N/A
3	2024	25,581	17.40	2.52	.20075757575	159	N/A	134.21	0	N/A
4	2025	25,581	17.43	2.54	.20075757575	159	N/A	134.21	0	N/A
5	2026	25,581	17.49	2.60	.20075757575	159	N/A	137.34	0	N/A
6	2027	25,581	17.55	2.66	.20075757575	159	N/A	140.54	0	N/A
7	2028	25,581	17.61	2.73	.20075757575	159	N/A	143.79	0	N/A
8	2029	25,581	17.67	2.79	.20075757575	159	N/A	147.10	0	N/A
9	2030	25,581	17.74	2.85	.20075757575	159	N/A	150.41	0	N/A
10	2031	25,581	17.80	2.91	.20075757575	159	N/A	153.77	0	N/A
11	2032	25,581	17.86	2.98	.20075757575	159	N/A	157.12	0	N/A
12	2033	25,581	17.93	3.04	.20075757575	159	N/A	160.50	0	N/A
13	2034	25,581	17.99	3.11	.20075757575	159	N/A	163.97	0	N/A
14	2035	25,581	18.06	3.18	.20075757575	159	N/A	167.56	0	N/A
15	2036	25,581	18.13	3.25	.20075757575	159	N/A	171.25	0	N/A
16	2037	25,581	18.20	3.32	.20075757575	159	N/A	175.07	0	N/A
17	2038	25,581	18.28	3.39	.20075757575	159	N/A	179.00	0	N/A
18	2039	25,581	18.35	3.47	.20075757575	159	N/A	182.99	0	N/A
19	2040	25,581	18.43	3.55	.20075757575	159	N/A	187.08	0	N/A
20	2041	25,581	18.51	3.62	.20075757575	159	N/A	191.27	0	N/A
21	2042	25,581	18.59	3.71	.20075757575	159	N/A	195.56	0	N/A
22	2043	25,581	18.67	3.79	.20075757575	159	N/A	199.94	0	N/A
23	2044	25,581	18.76	3.87	.20075757575	159	N/A	204.42	0	N/A
24	2045	25,581	18.85	3.96	.20075757575	159	N/A	209.01	0	N/A
25	2046	25,581	18.94	4.05	.20075757575	159	N/A	213.71	0	N/A

(1) The energy savings (E) include annual savings realized by Choice customers and traditional sales customers.
(2) Average energy cost is based on CPA's residential rate.
(3) Estimates are calculated from the SENDOUT model.
(4) Estimates are calculated from the LOADCALC model.
N/A is not applicable.

Company Name:
FORM-IRP-GAS-8

COLUMBIA GAS OF PENNSYLVANIA, INC.

COST-BENEFIT ANALYSIS INPUTS

PROGRAM: WarmWise Low Income Usage Reduction Program (WWLIURP)

t	N YEAR	INCENTIVE COST (I) $	UTILITY COSTS (UC) $	DISCOUNT RATES PARTICIPANT (d) %	NON-PARTICIPANT (1) (d) %	UTILITY (2) (d) %	ESCALATION RATE (3) (e) %	SYSTEM SALES OR DEMAND (4) (S) MCF	SALES OR DEMAND RATIO (f) %	UNCOLLECTIBLE ACCOUNT REDUCTION (UA) $
1	2022	0	8,932,244	7.41	2.00	7.41	4.6%	38,484,567	0.002239832	N/A
2	2023	0	0	7.41	2.55	7.41	2.5%	39,010,703	0.002239832	N/A
3	2024	0	0	7.41	2.78	7.41	2.4%	39,662,151	0.002239832	N/A
4	2025	0	0	7.41	2.94	7.41	2.4%	40,215,639	0.002239832	N/A
5	2026	0	0	7.41	3.04	7.41	2.3%	40,536,187	0.002239832	N/A
6	2027	0	0	7.41	3.09	7.41	2.3%	40,882,048	0.002239832	N/A
7	2028	0	0	7.41	3.12	7.41	2.3%	41,226,988	0.002239832	N/A
8	2029	0	0	7.41	3.12	7.41	2.3%	41,538,763	0.002239832	N/A
9	2030	0	0	7.41	3.12	7.41	2.3%	41,841,431	0.002239832	N/A
10	2031	0	0	7.41	3.12	7.41	2.2%	42,199,247	0.002239832	N/A
11	2032	0	0	7.41	3.12	7.41	2.2%	42,201,854	0.002239832	N/A
12	2033	0	0	7.41	3.12	7.41	2.2%	42,204,460	0.002239832	N/A
13	2034	0	0	7.41	3.12	7.41	2.2%	42,207,067	0.002239832	N/A
14	2035	0	0	7.41	3.12	7.41	2.2%	42,209,674	0.002239832	N/A
15	2036	0	0	7.41	3.12	7.41	2.2%	42,212,281	0.002239832	N/A
16	2037	0	0	7.41	3.12	7.41	2.2%	42,214,889	0.002239832	N/A
17	2038	0	0	7.41	3.12	7.41	2.2%	42,217,496	0.002239832	N/A
18	2039	0	0	7.41	3.12	7.41	2.2%	42,220,104	0.002239832	N/A
19	2040	0	0	7.41	3.12	7.41	2.2%	42,222,711	0.002239832	N/A
20	2041	0	0	7.41	3.12	7.41	2.2%	42,225,319	0.002239832	N/A
21	2042	0	0	7.41	3.12	7.41	2.2%	42,227,927	0.002239832	N/A
22	2043	0	0	7.41	3.12	7.41	2.2%	42,230,536	0.002239832	N/A
23	2044	0	0	7.41	3.12	7.41	2.2%	42,233,144	0.002239832	N/A
24	2045	0	0	7.41	3.12	7.41	2.2%	42,235,752	0.002239832	N/A
25	2046	0	0	7.41	3.12	7.41	2.3%	42,238,361	0.002239832	N/A
								1,038,899,301		

(1) The Non-Participant discount rate is based on the Global Insight forecast for 10-year U.S. Treasury bills.
(2) The Participant and Utility discount rates are Columbia Gas of Pennsylvania's requested return on rate base.
(3) The escalation rate is the GDP price deflator, based on the Global Insight U.S. economic outlook for February 2022.
(4) System Sales do not include transportation volumes.

Company Name:
FORM-IRP-GAS-8

COLUMBIA GAS OF PENNSYLVANIA, INC.
COST-BENEFIT ANALYSIS INPUTS

PROGRAM: WarmWise Audits & Rebates (WWA&R)

t	N YEAR	ENERGY SAVINGS (1) (E) MCF	AVERAGE ENERGY COST (2) (ACE) $ PER MCF	AVOIDED ENERGY COST (3) (MCE) $ PER MCF	PARTICIPANT DEMAND SAVINGS (4) (D) MCF	UTILITY CAPACITY SAVINGS (G) MCF	AVERAGE DEMAND COSTS (ACD) $/MCF	AVOIDED DEMAND COSTS (MCD) $/MCF	PARTICIPANT COSTS (PC) $	TAX CREDITS (TC) $
1	2022	8,277	18.19	3.30	.16293929712	51	N/A	135.01	0	N/A
2	2023	8,277	17.71	2.83	.16293929712	51	N/A	134.21	0	N/A
3	2024	8,277	17.40	2.52	.16293929712	51	N/A	134.21	0	N/A
4	2025	8,277	17.43	2.54	.16293929712	51	N/A	134.21	0	N/A
5	2026	8,277	17.49	2.60	.16293929712	51	N/A	137.34	0	N/A
6	2027	8,277	17.55	2.66	.16293929712	51	N/A	140.54	0	N/A
7	2028	8,277	17.61	2.73	.16293929712	51	N/A	143.79	0	N/A
8	2029	8,277	17.67	2.79	.16293929712	51	N/A	147.10	0	N/A
9	2030	8,277	17.74	2.85	.16293929712	51	N/A	150.41	0	N/A
10	2031	8,277	17.80	2.91	.16293929712	51	N/A	153.77	0	N/A
11	2032	8,277	17.86	2.98	.16293929712	51	N/A	157.12	0	N/A
12	2033	8,277	17.93	3.04	.16293929712	51	N/A	160.50	0	N/A
13	2034	8,277	17.99	3.11	.16293929712	51	N/A	163.97	0	N/A
14	2035	8,277	18.06	3.18	.16293929712	51	N/A	167.56	0	N/A
15	2036	8,277	18.13	3.25	.16293929712	51	N/A	171.25	0	N/A
16	2037	8,277	18.20	3.32	.16293929712	51	N/A	175.07	0	N/A
17	2038	8,277	18.28	3.39	.16293929712	51	N/A	179.00	0	N/A
18	2039	8,277	18.35	3.47	.16293929712	51	N/A	182.99	0	N/A
19	2040	8,277	18.43	3.55	.16293929712	51	N/A	187.08	0	N/A
20	2041	8,277	18.51	3.62	.16293929712	51	N/A	191.27	0	N/A
21	2042	8,277	18.59	3.71	.16293929712	51	N/A	195.56	0	N/A
22	2043	8,277	18.67	3.79	.16293929712	51	N/A	199.94	0	N/A
23	2044	8,277	18.76	3.87	.16293929712	51	N/A	204.42	0	N/A
24	2045	8,277	18.85	3.96	.16293929712	51	N/A	209.01	0	N/A
25	2046	8,277	18.94	4.05	.16293929712	51	N/A	213.71	0	N/A

(1) The energy savings (E) include annual savings realized by Choice customers and traditional sales customers.
(2) Average energy cost is based on CPA's residential rate.
(3) Estimates are calculated from the SENDOUT model.
(4) Estimates are calculated from the LOADCALC model.
N/A is not applicable.

Company Name:
FORM-IRP-GAS-8

COLUMBIA GAS OF PENNSYLVANIA, INC.
COST-BENEFIT ANALYSIS INPUTS

PROGRAM: WarmWise Audits & Rebates (WWA&R)

t	N YEAR	INCENTIVE COST (I) $	UTILITY COSTS (UC) $	DISCOUNT RATES PARTICIPANT (d) %	NON-PARTICIPANT (1) (d) %	UTILITY (2) (d) %	ESCALATION RATE (3) (e) %	SYSTEM SALES OR DEMAND (4) (S) MCF	SALES OR DEMAND RATIO (f) %	UNCOLLECTIBLE ACCOUNT REDUCTION (UA) $
1	2022	0	750,000	7.41	2.00	7.41	4.6%	38,501,871	0.000885186	N/A
2	2023	0	0	7.41	2.55	7.41	2.5%	39,028,007	0.000885186	N/A
3	2024	0	0	7.41	2.78	7.41	2.4%	39,679,455	0.000885186	N/A
4	2025	0	0	7.41	2.94	7.41	2.4%	40,232,943	0.000885186	N/A
5	2026	0	0	7.41	3.04	7.41	2.3%	40,553,491	0.000885186	N/A
6	2027	0	0	7.41	3.09	7.41	2.3%	40,899,352	0.000885186	N/A
7	2028	0	0	7.41	3.12	7.41	2.3%	41,244,292	0.000885186	N/A
8	2029	0	0	7.41	3.12	7.41	2.3%	41,556,067	0.000885186	N/A
9	2030	0	0	7.41	3.12	7.41	2.3%	41,858,735	0.000885186	N/A
10	2031	0	0	7.41	3.12	7.41	2.2%	42,216,551	0.000885186	N/A
11	2032	0	0	7.41	3.12	7.41	2.2%	42,219,158	0.000885186	N/A
12	2033	0	0	7.41	3.12	7.41	2.2%	42,221,764	0.000885186	N/A
13	2034	0	0	7.41	3.12	7.41	2.2%	42,224,371	0.000885186	N/A
14	2035	0	0	7.41	3.12	7.41	2.2%	42,226,978	0.000885186	N/A
15	2036	0	0	7.41	3.12	7.41	2.2%	42,229,585	0.000885186	N/A
16	2037	0	0	7.41	3.12	7.41	2.2%	42,232,193	0.000885186	N/A
17	2038	0	0	7.41	3.12	7.41	2.2%	42,234,800	0.000885186	N/A
18	2039	0	0	7.41	3.12	7.41	2.2%	42,237,408	0.000885186	N/A
19	2040	0	0	7.41	3.12	7.41	2.2%	42,240,015	0.000885186	N/A
20	2041	0	0	7.41	3.12	7.41	2.2%	42,242,623	0.000885186	N/A
21	2042	0	0	7.41	3.12	7.41	2.2%	42,245,231	0.000885186	N/A
22	2043	0	0	7.41	3.12	7.41	2.2%	42,247,840	0.000885186	N/A
23	2044	0	0	7.41	3.12	7.41	2.2%	42,250,448	0.000885186	N/A
24	2045	0	0	7.41	3.12	7.41	2.2%	42,253,056	0.000885186	N/A
25	2046	0	0	7.41	3.12	7.41	2.3%	42,255,665	0.000885186	N/A
								1,039,331,901		

(1) The Non-Participant discount rate is based on the Global Insight forecast for 10-year U.S. Treasury bills.
(2) The Participant and Utility discount rates are Columbia Gas of Pennsylvania's requested return on rate base.
(3) The escalation rate is the GDP price deflator, based on the Global Insight U.S. economic outlook for February 2022.
(4) System Sales do not include transportation volumes.

Company Name:
FORM-IRP-GAS-9

COLUMBIA GAS OF PENNSYLVANIA, INC.

COST-BENEFIT ANALYSIS RESULTS

PROGRAM: WarmWise Low Income Usage Reduction Program (WWLIURP)

PERIOD OF ANALYSIS		TOTAL UTILITY BENEFITS (Bu) $	TOTAL UTILITY COSTS (Cu) $	REVENUE REDUCTION COST (Cr) $	PARTICIPANT REVENUE REQUIREMENT (Rp) $	TOTAL PARTICIPANT BENEFITS (Bp) $	TOTAL PARTICIPANT COSTS (Cp) $
BEGINNING YEAR	ENDING YEAR						
2022	2046	1,143,097	8,316,026	5,144,762	27,590	5,144,762	0

DISCOUNTED PAYBACK PERIOD YRS	NET PRESENT VALUE			BENEFIT-COST RATIO			RATE IMPACT NON-PART (RIMnp) $ PER MCF
	PARTICIPANT (NPVp) $	NON-PART (NPVnp) $	UTILITY (NPVu) $	PARTICIPANT (BCRp) -	NON-PART (BCRnp) -	UTILITY (BCRu) -	
25	5,144,762	(12,290,102)	(7,172,929)	Infinity	0.0849	0.1375	0.0119

Company Name:

COLUMBIA GAS OF PENNSYLVANIA, INC.

FORM-IRP-GAS-9

COST-BENEFIT ANALYSIS RESULTS

PROGRAM: WarmWise Audits & Rebates (WWA&R)

PERIOD OF ANALYSIS		TOTAL UTILITY BENEFITS (Bu) $	TOTAL UTILITY COSTS (Cu) $	REVENUE REDUCTION COST (Cr) $	PARTICIPANT REVENUE REQUIREMENT (Rp) $	TOTAL PARTICIPANT BENEFITS (Bp) $	TOTAL PARTICIPANT COSTS (Cp) $
BEGINNING YEAR	ENDING YEAR						
2022	2046	369,085	698,259	1,664,642	1,765	1,664,642	0

DISCOUNTED PAYBACK PERIOD YRS	NET PRESENT VALUE			BENEFIT-COST RATIO			RATE IMPACT NON-PART (RIMnp) $ PER MCF
	PARTICIPANT (NPVp) $	NON-PART (NPVnp) $	UTILITY (NPVu) $	PARTICIPANT (BCRp) -	NON-PART (BCRnp) -	UTILITY (BCRu) -	
25	1,664,642	(1,992,051)	(329,174)	Infinity	0.1562	0.5286	0.0019

BEFORE THE PENNSYLVANIA PUBLIC UTILITY COMMISSION

Columbia Gas of Pennsylvania, Inc.
121 Champion Way, Suite 100
Canonsburg, PA 15317

ANNUAL RESOURCE PLANNING REPORT
Forms 3-9

Filed: June 2022

Information Submitted in Compliance with and Pursuant to Title 52
Pennsylvania Code Sections 59.81-59.84

COLUMBIA GAS OF PENNSYLVANIA, INC.

TABLE OF CONTENTS

Section 59.81: **General**

Pursuant to Section 59.81(a), each major jurisdictional gas utility must file an annual resource planning report (ARPR) on or before June 1, 1996 and June 1 of each succeeding year, except Form 1A/2A which filing date is March 1. One (1) original copy of the report must be submitted to:

Secretary
Pennsylvania Public Utility Commission
P.O. Box 3265
Harrisburg, PA 17105-3265

One courtesy copy should also be submitted to:

Pennsylvania Public Utility Commission
Bureau of Technical Utility Services
P.O. Box 3265
Harrisburg, PA 17105-3265

Also, submit one (1) copy to the following:

Office of Consumer Advocate
555 Walnut Street
Forum Place, 5th Floor
Harrisburg, PA 17101-1923

Office of Small Business Advocate
555 Walnut Street
Forum Place, 1st Floor
Harrisburg, PA 17101

Bureau of Investigation and Enforcement
P.O. Box 3265
Harrisburg, PA 17101-3265

Be sure to indicate the name and telephone number of at least one individual at the company who is familiar with the filing and will be available to answer any questions the Commission staff may have. You may also wish to list those individuals who are directly involved in the preparation of the various documents components.

Information contained in annual resource planning reports must be utility-specific. The report should follow an outline similar to that which is contained herein, with narrative accompanying the required data. Forms may be modified to accommodate wide columns of numbers and enhance readability, but the general format should be used to maintain consistency.

This information is not generally considered confidential. Utilities are obligated to provide complete information. However, we will treat as confidential those portions of the report designated by the utility as proprietary. If a utility's proprietary claim is challenged, the Commission will direct the utility to file a petition for protective order pursuant to 52 PA Code 5.423.

All questions concerning the reporting requirements for Forms IRP Gas 1A through 9 should be addressed to Pennsylvania Public Utility Commission Bureau of Conservation, Economics and Energy Planning.

Response: An original copy of Forms 3 through 9 is being submitted along with a general discussion of the methodologies, data sources, and assumptions.

General questions concerning the ARPR should be directed to Nicole M. Paloney, Director of Rates and Regulatory Affairs at (614) 531-3511. The following individuals will be available to answer specific questions concerning each section:

Form 3 – Adam Gale – Director, Demand Forecasting (614) 313-5928.

Form 4 – Tina Monnig – Manager of Planning (614) 302-4065

Forms 5-9 – Deborah Davis – Manager, Universal Services (412) 841-4928

Section 59.81: **Form IRP-Gas 3 - Historical, Current, and Forecast Number of Customers**

Provide the number of year-end customers displayed by component parts.

Response: Please see the attached form.

FORM-IRP-GAS-3: NUMBER OF CUSTOMERS (YEAR END)
REPORTING UTILITY: COLUMBIA GAS OF PENNSYLVANIA, INC.

	Historical Data		Current Year	Three Year Forecast		
Index Year	-2	-1	0	1	2	3
Actual Year	2020	2021	2022	2023	2024	2025
Firm Sales						
Retail Residential	322,930	353,598	361,118	366,470	372,485	377,946
Retail Commercial	25,355	25,992	25,949	25,995	26,034	26,068
Retail Industrial	71	75	70	70	70	70
Other	0	0	0	0	0	0
Subtotal Sales Service	348,356	379,665	387,137	392,535	398,589	404,084
Electric Power Generation	2	3	2	1	2	2
Transportation Service	92,295	63,020	58,950	54,930	50,910	46,890
CUSTOMER TOTAL	440,653	442,688	446,089	447,466	449,501	450,976
Increase (Decrease)	4,056	2,035	3,401	1,377	2,035	1,475
Percent Change (%)	0.009	0.005	0.008	0.003	0.005	0.003

Note: In 2021, CAP customers were included in Retail Residential, instead of Transportation as there was no CAP supplier. The forecast assumes that CAP customers will be included in Sales for the years 2022-2025.

Section 59.81 **Form IRP-Gas 4A and 4B - Annual and Peak Day Energy Supply and Demand Requirements**

For gas supply, total "Supply Contracts" and "Spot Purchases" and subtract "Deductions" to obtain "Net Gas Supply."

For requirements, total "Firm Requirement" and "Interruptible Requirements" and subtract "Load Deductions" to obtain "Net Gas Requirements."

Subtract "Net Gas Requirements" from "Net Gas Supply" to obtain "Surplus or Deficiency."

Response: Please see attached forms.

FORM-IRP-GAS-4A: ANNUAL SUPPLY AND REQUIREMENTS SUMMARY
REPORTING UTILITY: COLUMBIA GAS OF PENNSYLVANIA, INC.
(volumes in Mmcf)

	Historical Data		Current Year	Three Year Forecast		
Index Year	-2	-1	0	1	2	3
Actual Year	2020	2021	2022	2023	2024	225
Gas Supply:						
Supply Contracts	18,320.0	24,846.0	38,498.0	39,080.0	39,766.0	40,281.0
Spot Purchases	14,839.8	10,530.0				
Subtotal Gas Supply	33,159.8	35,376.0	38,498.0	39,080.0	39,766.0	40,281.0
Transportation	39,055.0	39,949.1	41,065.2	41,238.6	41,246.2	40,930.6
TOTAL GAS SUPPLY	72,214.8	75,325.0	79,563.2	80,318.6	81,012.2	81,211.6
Requirements:						
Firm Requirements	33,159.8	35,376.0	38,498.0	39,080.0	39,766.0	40,281.0
Interruptible Requirements	0.0	0.0	0.0	0.0	0.0	0.0
Subtotal Firm & Interruptible	33,159.8	35,376.0	38,498.0	39,080.0	39,766.0	40,281.0
Transportation	39,055.0	39,949.1	41,065.2	41,238.6	41,246.2	40,930.6
Load Reductions						
TOTAL GAS REQUIREMENTS	72,214.8	75,325.0	79,563.2	80,318.6	81,012.2	81,211.6
Surplus (Deficiency)	0.0	0.0	0.0	0.0	0.0	0.0

FORM-IRP-GAS-4B PEAK DAY SUPPLY AND REQUIREMENTS SUMMARY
REPORTING UTILITY: COLUMBIA GAS OF PENNSYLVANIA, INC.
(volumes in Mmcf)

	Historical Data		Current Year	Three Year Forecast		
Index Year	-2	-1	0	1	2	3
Actual Year	2020	2021	2022	2023	2024	2025
Gas Supply:						
Supply Contracts	296.3	303.6	282.1	449.8	457.8	465.9
Spot Purchases	0.0	0.0	0.0	0.0	0.0	0.0
Subtotal Gas Supply	296.3	303.6	282.1	449.8	457.8	465.9
Transportation	215.3	206.7	214.8	334.3	329.2	323.0
TOTAL GAS SUPPLY	511.6	510.3	496.9	784.1	787.0	788.9
Requirements:						
Firm Requirements	296.3	303.6	282.1	449.8	457.8	465.9
Interruptible Requirements	0.0	0.0	0.0	0.0	0.0	0.0
Subtotal Firm & Interruptible	296.3	303.6	282.1	449.8	457.8	465.9
Transportation	215.3	206.7	214.8	334.3	329.2	323.0
Load Reductions	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL GAS REQUIREMENTS	511.6	510.3	496.9	784.1	787.0	788.9
Surplus (Deficiency)	0.0	0.0	0.0	0.0	0.0	0.0

Section 59.82 **Energy Conservation Report**

A. The ARPR must include a detailed description of all conservation and load management programs implemented by the utility during the past calendar year and all programs proposed to be implemented this (current) year. Complete Forms IRP-Gas-5 through IRP-Gas-9 as follows:

Form IRP-Gas 5 - Program Description

1. One Form IRP-GAS-5 must be provided for each program.

2. Provide a descriptive name of the program, the participating customer class and the program status (existing or proposed).

3. Provide the name of an appropriate contact person and telephone number.

4. Succinctly describe the objective(s) of the program.

5. Provide details of program activities and a schedule for implementation.

6. Provide actual or anticipated results in terms of peak day reduction, load shifted, energy saved or other results, where applicable.

7. Provide a breakdown of all monetary and personnel resources. Additional program expense categories may be used.

Response: Please see the following forms.

FORM-IRP-GAS-5 PROGRAM DESCRIPTION

Company: Columbia Gas of Pennsylvania, Inc.

Program: **WarmWise Low Income Usage Reduction Program (WWLIURP)**

Existing [X] Proposed [ ]

Contact Person: Deborah Davis
724-416-6316

Objective: To reduce the uncollectible accounts and the collection and termination expenses by enabling low-income customers to reduce their energy usage.

Details of Activity and Implementation Schedule:

Eligible customers are targeted for involvement in the program. For each participating household, Columbia will perform a detailed energy survey, an in-the-home customer education session, and comprehensive weatherization treatments (e.g., insulation and air leakage measures).

Actual and/or Anticipated Results:

	Peak Load	Energy Savings			
	Reduction	Electric	Gas	Oil	Other
Year	Mcf	Mwh	Mcf	Gallons	Results
2021[1)]	67	0	9916	0	307 Homes Weatherized
2022[(2)]	159	0	25,581	0	792 Homes Projected

Monetary and Personnel Resources:

		Categorized Program Expenses		
Year	Personnel Est. Hrs. [(3)]	Outside Services	Admin.	Total
2021[(1)]	12,280	$3,159,697	$303,411	$3,463,108
2022[(2)]	31,680	$8,332,244	$600,000.	$8,932,244

(1) Peak and energy savings are calculated based upon the weather efficiency measures taken at the weatherized homes.
(2) Budgeted
(3) Personnel hours were estimated by multiplying the number of homes by 40, the average number of hours spent per house.

FORM-IRP-GAS-5 PROGRAM DESCRIPTION

Company: Columbia Gas of Pennsylvania, Inc.

Program: **Emergency Repair Fund Program**

Existing [X] Proposed [ ]

Contact Person: Deborah Davis
724-416-6316

Objective: To reduce the energy burden of low-income customers by providing a furnace repair and replacement program.

Details of Activity and Implementation Schedule:

This fund is utilized to assist low-income property owners to maintain gas service and reduce usage due to inefficient equipment.

Actual and/or Anticipated Results:

Year	Peak Load Reduction[3] Mcf	Energy Savings[3] Electric Mwh	Gas Mcf	Oil Gallons	Other Results
2021[1]	---				235 Services Provided
2022[2]	---				269 Services Projected

Monetary and Personnel Resources:

Year	Personnel Est. Hrs.	Categorized Program Expenses Outside Services	Admin	Total
2021[1]	940	$533,748	$59,638	$596,386
2022[2]	1077	$630,000	$70,000	$700,000

(1) Actual
(2) Budgeted
(3) No savings estimates have been developed.

FORM-IRP-GAS-5 PROGRAM DESCRIPTION

Company: Columbia Gas of Pennsylvania, Inc.

Program: **Customer Assistance Program**

Existing [X] Proposed [ ]

Contact Person: Deborah Davis
724-416-6316

Objective: To reduce the growth in uncollectible account balances and the collection and termination expenses associated with accounts in arrears by providing low-income customers with affordable payment plans and conservation education.

Details of Activity and Implementation Schedule:

Eligible customers are those at or below 150% of poverty (income of $37,650 for a family of four); a failed budget plus customer; and payment troubled. For each participant, an affordable payment will be established based on the base budget, household size and household income.

Actual and/or Anticipated Results:

Year	Peak Load Reduction[3] Mcf	Energy Savings[3] Electric Mwh	Gas Mcf	Oil Gallons	Other Results
2021[1]	---		---		28,427 Customers
2022[2]	---		---		31,000 Customers

Monetary and Personnel Resources:

Year	Personnel Est. Hrs.	Outside Services	Admin.	Shortfall[4]	Pre-Program Arrearages [5]	Total
2021[1]	N/A	$722,874	$28,388	$20,023,299	$3,284,454	$24,059,015
2022[2]	N/A	$1,250,000	$50,000	$20,442,928	$975,247	$22,718,175

(1) Actuals reflect results at December 31, 2021.
(2) Budgeted
(3) No savings estimates have been developed.
(4) “Shortfall” is the difference between the CAP customers’ discounted bills and what the bills would have been if they were billed under standard residential rates. This amount is being recovered under Columbia’s Rider USP.
(5) Pre-program arrearages are the amounts written off upon the customer’s enrollment in CAP.

FORM-IRP-GAS-5 PROGRAM DESCRIPTION

Company: Columbia Gas of Pennsylvania, Inc.

Program: **WarmWise Audits and Rebates (WWA&R)**

Existing [x] Proposed [ ]

Contact Person: Deb Davis
724-416-6316

Objective: To provide home energy-audits and an energy efficiency plan with financial incentives for customer who may not qualify for other consumption reduction programs.

Details of Activity and Implementation Schedule:

Income eligible customers are targeted for involvement in the program. Columbia will perform a BPI audit, an in-the-home customer education session, and financial incentives for the installation of recommended measures.

Actual and/or Anticipated Results:

	Peak Load Reduction (1)	Energy Savings			
Year	Mcf	Electric Mwh	Gas MCF(1)	Oil Gallons	Other Results
2021	32		4654		176 Participants
2022	51		8277		313 Participants Projected

Monetary and Personnel Resources:

		Categorized Program Expenses		
Year	Personnel Est. Hrs. (3)	Outside Services(4)	Admin.	Total
2021	880	$350,630	$120,156	$470,785
2022	1565	$620,000	$130,000	$750,000

(1) These results are based off 12 months data (2021)
(2) Personnel hours were estimated by multiplying the number of home completed by 5 hours, the average time to serve a customer in the home.
(3) Outside services includes customer audit costs and rebates for audit recommended installed measures and external administrative costs.

Section 59.82 **Form-IRP-Gas-6 - Energy Users**

The utility shall provide the number of year-end users displayed by component parts.

Response: Please see the attached form.

FORM-IRP-GAS-6 ENERGY USERS

Company: Columbia Gas of Pennsylvania, Inc.

Energy Users	Number of Customers (Year-end)	Annual Energy Consumption * (MCF)	Conservation Impact Reduction or MCF savings Target	Actual
Residential (Heating)	353,598	27,531,929	7,787	3,351
Residential (Other)	0	0		
Small Com. & Ind.	25,992	8,264,439		
Large Com. & Ind.	75	173,813		
Street Lighting	0	0		
Railroads	0	0		
Resale	0	0		
Interruptible	0	0		
Interdepartmental	0	0		
Other-Electric Power	0	0		
Other - Transportation	63,020	39,918,632	26,071	11,219
Other - Misc	0	0		
TOTALS	442,685	75,888,812	33,858	14,570

* Previous calendar year (2021).
** Approximately 77% of WWLIURP customers are transportation (CHOICE) customers.

Section 59.82 **Form-IRP-Gas-7 - Conservation and Load Management Program Summary**

1. Use this form to provide a summary of the information provided in Form IRP-Gas-5.

2. Provide annual totals for program for results and monetary and personnel resources.

3. For programs with annual expenditures of more than $100,000 or more than 0.1% of total annual revenue, a cost benefit analysis must be performed. The current methodology, prescribed by the Bureau of Conservation, Economics and Energy Planning pursuant to Section 59.82(E), is essentially the same as that contained in the former Section 69.122, with minor modifications. This methodology shall be used until further notice. The following discussion provides instructions for completing Form IRP-GAS-8 (analysis inputs) and Form IRP-GAS-9 (analysis results), including the necessary definitions and equations.

Response: Please see the following form.

FORM-IRP-GAS-7 PROGRAM SUMMARY

Company: Columbia Gas of Pennsylvania, Inc.

Program Name 2022 (1)	Peak Load Reduction (MCF)	Energy Use Change (MCF)	Personnel Est. Hrs.	Categorized Program Expenses Outside Services	Admin.	Total
WarmWise Low Income Usage Reduction Program (WWLIURP)	159	25,581	31,680	8,332,244	600,000	8,932,244
Emergency Repair Program	NA	NA	1,077	630,000	70,000	700,000
Customer Assistance Program	NA	NA	NA	1,250,000	50,000	1,300,000
WarmWise Audits & Rebates (WWA&R)	51	8,277	1,565	620,000	130,000	750,000
Totals	210	33,858	34,322	$10,832,244	$850,000	$11,682,244

(1) Budgeted

Section 59.82 **Form IRP-GAS-8 - Conservation and Load Management Program Cost Benefit Analysis Inputs**

1. Variable **E** represents the program participants' annual energy savings occurring in year **t**, in MCF.

2. Variable **CE** represents the program participants' cumulative energy savings, in MCF.

3. Variable **ES** represents the amount of energy use that has been shifted from peak to off-peak in MCF.

4. Variable **D** represents the program participants' demand reduction occurring in year **t**, in MCF.

5. Variable **G** represents the equivalent supply reduction, including all identifiable and quantifiable reductions in the utility's demand requirement, occurring in year **t**, in MCF.

6. Variable **PC** represents the direct cost to the participants of the action or measure, including the initial capital cost, sales tax, operation and maintenance costs, and removal costs less salvage.

7. Variable **I** represents the cost of any monetary incentive paid directly to the participants to offset explicitly quantified participant costs.

8. Variable **UC** represents all other utility program costs, excluding direct incentives.

9. Variable **d** represents the appropriate discount rate.

10. Variable **ACE** represents the average cost of energy for participants in year **t**. The average cost should reflect actual rates currently in effect, including seasonal-differentiated rates where appropriate, and reasonable escalation factors.

11. Variable **ACD** represents the average cost of demand avoided by participants in year **t.** This variable should be developed by using

actual rates currently in effect and escalating those costs into the future. Seasonal-differentiated rates should be used, if appropriate.

12. Variable **CE** represents the marginal cost of energy avoided by the utility in year **t**. Transmission and distribution losses should be reflected in either **MCE** or **E**. If costs are substantially affected by season, appropriate time periods should be used to more closely reflect marginal energy costs.

13. Variable **MCD** represents the marginal cost of supply avoided by the utility in year **t**. If costs are substantially affected by season, appropriate time periods should be used to more closely reflect marginal capacity costs.

14. Variable **S** represents system sales, in thousand cubic feet reflecting the effects of the program over the period of analysis.

15. The period of analysis, **N**, may be less than 30 years, but should be of sufficient length to reflect all program costs and benefits.

Response: Please see the following form.

Company Name:

COLUMBIA GAS OF PENNSYLVANIA, INC.

FORM-IRP-GAS-8

COST-BENEFIT ANALYSIS INPUTS

PROGRAM: WarmWise Low Income Usage Reduction Program (WWLIURP)

t	N YEAR	ENERGY SAVINGS (1) (E) MCF	AVERAGE ENERGY COST (2) (ACE) $ PER MCF	AVOIDED ENERGY COST (3) (MCE) $ PER MCF	PARTICIPANT DEMAND SAVINGS (4) (D) MCF	UTILITY CAPACITY SAVINGS (G) MCF	AVERAGE DEMAND COSTS (ACD) $/MCF	AVOIDED DEMAND COSTS (MCD) $/MCF	PARTICIPANT COSTS (PC) $	TAX CREDITS (TC) $
1	2022	25,581	18.19	3.30	.20075757575	159	N/A	135.01	0	N/A
2	2023	25,581	17.71	2.83	.20075757575	159	N/A	134.21	0	N/A
3	2024	25,581	17.40	2.52	.20075757575	159	N/A	134.21	0	N/A
4	2025	25,581	17.43	2.54	.20075757575	159	N/A	134.21	0	N/A
5	2026	25,581	17.49	2.60	.20075757575	159	N/A	137.34	0	N/A
6	2027	25,581	17.55	2.66	.20075757575	159	N/A	140.54	0	N/A
7	2028	25,581	17.61	2.73	.20075757575	159	N/A	143.79	0	N/A
8	2029	25,581	17.67	2.79	.20075757575	159	N/A	147.10	0	N/A
9	2030	25,581	17.74	2.85	.20075757575	159	N/A	150.41	0	N/A
10	2031	25,581	17.80	2.91	.20075757575	159	N/A	153.77	0	N/A
11	2032	25,581	17.86	2.98	.20075757575	159	N/A	157.12	0	N/A
12	2033	25,581	17.93	3.04	.20075757575	159	N/A	160.50	0	N/A
13	2034	25,581	17.99	3.11	.20075757575	159	N/A	163.97	0	N/A
14	2035	25,581	18.06	3.18	.20075757575	159	N/A	167.56	0	N/A
15	2036	25,581	18.13	3.25	.20075757575	159	N/A	171.25	0	N/A
16	2037	25,581	18.20	3.32	.20075757575	159	N/A	175.07	0	N/A
17	2038	25,581	18.28	3.39	.20075757575	159	N/A	179.00	0	N/A
18	2039	25,581	18.35	3.47	.20075757575	159	N/A	182.99	0	N/A
19	2040	25,581	18.43	3.55	.20075757575	159	N/A	187.08	0	N/A
20	2041	25,581	18.51	3.62	.20075757575	159	N/A	191.27	0	N/A
21	2042	25,581	18.59	3.71	.20075757575	159	N/A	195.56	0	N/A
22	2043	25,581	18.67	3.79	.20075757575	159	N/A	199.94	0	N/A
23	2044	25,581	18.76	3.87	.20075757575	159	N/A	204.42	0	N/A
24	2045	25,581	18.85	3.96	.20075757575	159	N/A	209.01	0	N/A
25	2046	25,581	18.94	4.05	.20075757575	159	N/A	213.71	0	N/A

(1) The energy savings (E) include annual savings realized by Choice customers and traditional sales customers.
(2) Average energy cost is based on CPA's residential rate.
(3) Estimates are calculated from the SENDOUT model.
(4) Estimates are calculated from the LOADCALC model.
N/A is not applicable.

Company Name:
FORM-IRP-GAS-8

COLUMBIA GAS OF PENNSYLVANIA, INC.

COST-BENEFIT ANALYSIS INPUTS

PROGRAM: WarmWise Low Income Usage Reduction Program (WWLIURP)

t	N YEAR	INCENTIVE COST (I) $	UTILITY COSTS (UC) $	DISCOUNT RATES PARTICIPANT (d) %	NON-PARTICIPANT (1) (d) %	UTILITY (2) (d) %	ESCALATION RATE (3) (e) %	SYSTEM SALES OR DEMAND (4) (S) MCF	SALES OR DEMAND RATIO (f) %	UNCOLLECTIBLE ACCOUNT REDUCTION (UA) $
1	2022	0	8,932,244	7.41	2.00	7.41	4.6%	38,484,567	0.002239832	N/A
2	2023	0	0	7.41	2.55	7.41	2.5%	39,010,703	0.002239832	N/A
3	2024	0	0	7.41	2.78	7.41	2.4%	39,662,151	0.002239832	N/A
4	2025	0	0	7.41	2.94	7.41	2.4%	40,215,639	0.002239832	N/A
5	2026	0	0	7.41	3.04	7.41	2.3%	40,536,187	0.002239832	N/A
6	2027	0	0	7.41	3.09	7.41	2.3%	40,882,048	0.002239832	N/A
7	2028	0	0	7.41	3.12	7.41	2.3%	41,226,988	0.002239832	N/A
8	2029	0	0	7.41	3.12	7.41	2.3%	41,538,763	0.002239832	N/A
9	2030	0	0	7.41	3.12	7.41	2.3%	41,841,431	0.002239832	N/A
10	2031	0	0	7.41	3.12	7.41	2.2%	42,199,247	0.002239832	N/A
11	2032	0	0	7.41	3.12	7.41	2.2%	42,201,854	0.002239832	N/A
12	2033	0	0	7.41	3.12	7.41	2.2%	42,204,460	0.002239832	N/A
13	2034	0	0	7.41	3.12	7.41	2.2%	42,207,067	0.002239832	N/A
14	2035	0	0	7.41	3.12	7.41	2.2%	42,209,674	0.002239832	N/A
15	2036	0	0	7.41	3.12	7.41	2.2%	42,212,281	0.002239832	N/A
16	2037	0	0	7.41	3.12	7.41	2.2%	42,214,889	0.002239832	N/A
17	2038	0	0	7.41	3.12	7.41	2.2%	42,217,496	0.002239832	N/A
18	2039	0	0	7.41	3.12	7.41	2.2%	42,220,104	0.002239832	N/A
19	2040	0	0	7.41	3.12	7.41	2.2%	42,222,711	0.002239832	N/A
20	2041	0	0	7.41	3.12	7.41	2.2%	42,225,319	0.002239832	N/A
21	2042	0	0	7.41	3.12	7.41	2.2%	42,227,927	0.002239832	N/A
22	2043	0	0	7.41	3.12	7.41	2.2%	42,230,536	0.002239832	N/A
23	2044	0	0	7.41	3.12	7.41	2.2%	42,233,144	0.002239832	N/A
24	2045	0	0	7.41	3.12	7.41	2.2%	42,235,752	0.002239832	N/A
25	2046	0	0	7.41	3.12	7.41	2.3%	42,238,361	0.002239832	N/A
								1,038,899,301		

(1) The Non-Participant discount rate is based on the Global Insight forecast for 10-year U.S. Treasury bills.
(2) The Participant and Utility discount rates are Columbia Gas of Pennsylvania's requested return on rate base.
(3) The escalation rate is the GDP price deflator, based on the Global Insight U.S. economic outlook for February 2022.
(4) System Sales do not include transportation volumes.

Company Name:
FORM-IRP-GAS-8

COLUMBIA GAS OF PENNSYLVANIA, INC.
COST-BENEFIT ANALYSIS INPUTS

PROGRAM: WarmWise Audits & Rebates (WWA&R)

t	N YEAR	ENERGY SAVINGS (1) (E) MCF	AVERAGE ENERGY COST (2) (ACE) $ PER MCF	AVOIDED ENERGY COST (3) (MCE) $ PER MCF	PARTICIPANT DEMAND SAVINGS (4) (D) MCF	UTILITY CAPACITY SAVINGS (G) MCF	AVERAGE DEMAND COSTS (ACD) $/MCF	AVOIDED DEMAND COSTS (MCD) $/MCF	PARTICIPANT COSTS (PC) $	TAX CREDITS (TC) $
1	2022	8,277	18.19	3.30	.16293929712	51	N/A	135.01	0	N/A
2	2023	8,277	17.71	2.83	.16293929712	51	N/A	134.21	0	N/A
3	2024	8,277	17.40	2.52	.16293929712	51	N/A	134.21	0	N/A
4	2025	8,277	17.43	2.54	.16293929712	51	N/A	134.21	0	N/A
5	2026	8,277	17.49	2.60	.16293929712	51	N/A	137.34	0	N/A
6	2027	8,277	17.55	2.66	.16293929712	51	N/A	140.54	0	N/A
7	2028	8,277	17.61	2.73	.16293929712	51	N/A	143.79	0	N/A
8	2029	8,277	17.67	2.79	.16293929712	51	N/A	147.10	0	N/A
9	2030	8,277	17.74	2.85	.16293929712	51	N/A	150.41	0	N/A
10	2031	8,277	17.80	2.91	.16293929712	51	N/A	153.77	0	N/A
11	2032	8,277	17.86	2.98	.16293929712	51	N/A	157.12	0	N/A
12	2033	8,277	17.93	3.04	.16293929712	51	N/A	160.50	0	N/A
13	2034	8,277	17.99	3.11	.16293929712	51	N/A	163.97	0	N/A
14	2035	8,277	18.06	3.18	.16293929712	51	N/A	167.56	0	N/A
15	2036	8,277	18.13	3.25	.16293929712	51	N/A	171.25	0	N/A
16	2037	8,277	18.20	3.32	.16293929712	51	N/A	175.07	0	N/A
17	2038	8,277	18.28	3.39	.16293929712	51	N/A	179.00	0	N/A
18	2039	8,277	18.35	3.47	.16293929712	51	N/A	182.99	0	N/A
19	2040	8,277	18.43	3.55	.16293929712	51	N/A	187.08	0	N/A
20	2041	8,277	18.51	3.62	.16293929712	51	N/A	191.27	0	N/A
21	2042	8,277	18.59	3.71	.16293929712	51	N/A	195.56	0	N/A
22	2043	8,277	18.67	3.79	.16293929712	51	N/A	199.94	0	N/A
23	2044	8,277	18.76	3.87	.16293929712	51	N/A	204.42	0	N/A
24	2045	8,277	18.85	3.96	.16293929712	51	N/A	209.01	0	N/A
25	2046	8,277	18.94	4.05	.16293929712	51	N/A	213.71	0	N/A

(1) The energy savings (E) include annual savings realized by Choice customers and traditional sales customers.
(2) Average energy cost is based on CPA's residential rate.
(3) Estimates are calculated from the SENDOUT model.
(4) Estimates are calculated from the LOADCALC model.
N/A is not applicable.

Company Name:
FORM-IRP-GAS-8

COLUMBIA GAS OF PENNSYLVANIA, INC.
COST-BENEFIT ANALYSIS INPUTS

PROGRAM: WarmWise Audits & Rebates (WWA&R)

t	N YEAR	INCENTIVE COST (I) $	UTILITY COSTS (UC) $	DISCOUNT RATES PARTICIPANT (d) %	NON-PARTICIPANT (1) (d) %	UTILITY (2) (d) %	ESCALATION RATE (3) (e) %	SYSTEM SALES OR DEMAND (4) (S) MCF	SALES OR DEMAND RATIO (f) %	UNCOLLECTIBLE ACCOUNT REDUCTION (UA) $
1	2022	0	750,000	7.41	2.00	7.41	4.6%	38,501,871	0.000885186	N/A
2	2023	0	0	7.41	2.55	7.41	2.5%	39,028,007	0.000885186	N/A
3	2024	0	0	7.41	2.78	7.41	2.4%	39,679,455	0.000885186	N/A
4	2025	0	0	7.41	2.94	7.41	2.4%	40,232,943	0.000885186	N/A
5	2026	0	0	7.41	3.04	7.41	2.3%	40,553,491	0.000885186	N/A
6	2027	0	0	7.41	3.09	7.41	2.3%	40,899,352	0.000885186	N/A
7	2028	0	0	7.41	3.12	7.41	2.3%	41,244,292	0.000885186	N/A
8	2029	0	0	7.41	3.12	7.41	2.3%	41,556,067	0.000885186	N/A
9	2030	0	0	7.41	3.12	7.41	2.3%	41,858,735	0.000885186	N/A
10	2031	0	0	7.41	3.12	7.41	2.2%	42,216,551	0.000885186	N/A
11	2032	0	0	7.41	3.12	7.41	2.2%	42,219,158	0.000885186	N/A
12	2033	0	0	7.41	3.12	7.41	2.2%	42,221,764	0.000885186	N/A
13	2034	0	0	7.41	3.12	7.41	2.2%	42,224,371	0.000885186	N/A
14	2035	0	0	7.41	3.12	7.41	2.2%	42,226,978	0.000885186	N/A
15	2036	0	0	7.41	3.12	7.41	2.2%	42,229,585	0.000885186	N/A
16	2037	0	0	7.41	3.12	7.41	2.2%	42,232,193	0.000885186	N/A
17	2038	0	0	7.41	3.12	7.41	2.2%	42,234,800	0.000885186	N/A
18	2039	0	0	7.41	3.12	7.41	2.2%	42,237,408	0.000885186	N/A
19	2040	0	0	7.41	3.12	7.41	2.2%	42,240,015	0.000885186	N/A
20	2041	0	0	7.41	3.12	7.41	2.2%	42,242,623	0.000885186	N/A
21	2042	0	0	7.41	3.12	7.41	2.2%	42,245,231	0.000885186	N/A
22	2043	0	0	7.41	3.12	7.41	2.2%	42,247,840	0.000885186	N/A
23	2044	0	0	7.41	3.12	7.41	2.2%	42,250,448	0.000885186	N/A
24	2045	0	0	7.41	3.12	7.41	2.2%	42,253,056	0.000885186	N/A
25	2046	0	0	7.41	3.12	7.41	2.3%	42,255,665	0.000885186	N/A
								1,039,331,901		

(1) The Non-Participant discount rate is based on the Global Insight forecast for 10-year U.S. Treasury bills.
(2) The Participant and Utility discount rates are Columbia Gas of Pennsylvania's requested return on rate base.
(3) The escalation rate is the GDP price deflator, based on the Global Insight U.S. economic outlook for February 2022.
(4) System Sales do not include transportation volumes.

Section 59.82 **Form-IRP-Gas-9 - Conservation and Load Management Program Cost Benefit Analysis Results**

The results of the cost benefit analysis are presented in terms of benefit-cost ratios and net present values from four perspectives: participant, non-participant, all ratepayers and utility. It is noted that the difference between utility benefits, $\mathbf{B}_{up}$, under the participant test and utility benefits, $\mathbf{B}_{un}$, under the utility revenue requirement test is the discount rate, **d**. The discount rates should reflect the time value of money from the viewpoint being evaluated. For the participant and non-participant tests, market interest rates could be used. A utility's expected cost of capital could be used as the discount factor in determining a utility's net present value of program costs and benefits.

Provide all assumptions used in the evaluation methodology, such as energy and demand savings and costs, marginal costs, tax rates, escalation factors and rates of participation. Identify and discuss unquantified and qualitative variables, such as fuel displacement, environmental impacts, reliability benefits, customer inconvenience and benefits to the local economy.

Response: The appropriate form is attached.

Company Name:
FORM-IRP-GAS-9

COLUMBIA GAS OF PENNSYLVANIA, INC.

COST-BENEFIT ANALYSIS RESULTS

PROGRAM: WarmWise Low Income Usage Reduction Program (WWLIURP)

PERIOD OF ANALYSIS		TOTAL UTILITY BENEFITS (Bu) $	TOTAL UTILITY COSTS (Cu) $	REVENUE REDUCTION COST (Cr) $	PARTICIPANT REVENUE REQUIREMENT (Rp) $	TOTAL PARTICIPANT BENEFITS (Bp) $	TOTAL PARTICIPANT COSTS (Cp) $
BEGINNING YEAR	ENDING YEAR						
2022	2046	1,143,097	8,316,026	5,144,762	27,590	5,144,762	0

DISCOUNTED PAYBACK PERIOD YRS	NET PRESENT VALUE			BENEFIT-COST RATIO			RATE IMPACT NON-PART (RIMnp) $ PER MCF
	PARTICIPANT (NPVp) $	NON-PART (NPVnp) $	UTILITY (NPVu) $	PARTICIPANT (BCRp) -	NON-PART (BCRnp) -	UTILITY (BCRu) -	
25	5,144,762	(12,290,102)	(7,172,929)	Infinity	0.0849	0.1375	0.0119

Company Name:

COLUMBIA GAS OF PENNSYLVANIA, INC.

FORM-IRP-GAS-9

COST-BENEFIT ANALYSIS RESULTS

PROGRAM: WarmWise Audits & Rebates (WWA&R)

PERIOD OF ANALYSIS		TOTAL UTILITY BENEFITS (Bu) $	TOTAL UTILITY COSTS (Cu) $	REVENUE REDUCTION COST (Cr) $	PARTICIPANT REVENUE REQUIREMENT (Rp) $	TOTAL PARTICIPANT BENEFITS (Bp) $	TOTAL PARTICIPANT COSTS (Cp) $
BEGINNING YEAR	ENDING YEAR						
2022	2046	369,085	698,259	1,664,642	1,765	1,664,642	0

DISCOUNTED PAYBACK PERIOD YRS	NET PRESENT VALUE			BENEFIT-COST RATIO			RATE IMPACT NON-PART (RIMnp) $ PER MCF
	PARTICIPANT (NPVp) $	NON-PART (NPVnp) $	UTILITY (NPVu) $	PARTICIPANT (BCRp) -	NON-PART (BCRnp) -	UTILITY (BCRu) -	
25	1,664,642	(1,992,051)	(329,174)	Infinity	0.1562	0.5286	0.0019

Section 59.81(C) **Public Information and Distribution**

A. Provide a summary of the resource planning report which is suitable for distribution to the public. The summary should be separately bound. Suggested items for inclusion in the summary are: a general description of the utility's overall approach to integrated resource planning; a brief description of the methods used in developing the load forecasts; a brief description of the utility's service territory, including a territorial map, and a general description of the utility's plans for meeting customers' needs over the three year period.

B. The summary must include a 3-year implementation plan that specifies all activities scheduled for the acquisition and development of the resources delineated in the report, which are expected to take place during the next three years.

C. Copies of the summary must be maintained by the utility open to public inspection during normal business hours. Copies of the summary should also be available for distribution to the general public, upon request.

Response: Columbia Gas of Pennsylvania's 2022 Annual Resource Planning Summary Report is provided as a companion document.