Alamos Gold Inc.

Economic Contribution Assessment of Alamos Gold Projects in Turkey

Final Report

3 October 2019

Building a better working world

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1. Executive Summary

1. Executive Summary

Alamos Gold Inc. is a Canadian-based intermediate gold producer with four operating mines in Canada and Mexico, and development projects in Turkey, Canada, Mexico and the United States. Alamos Gold Inc. acquired Kirazli, Ağı Dağı, and Camyurt projects located in the Çanakkale Province on the Biga Peninsula of northwestern Turkey in 2010.

To date, Alamos has been granted approval of the Environmental Impact Assessment, Forestry Permit, GSM, and Operating Permit from Turkish authorities. The company maintains an administrative office in Ankara, and exploration offices in Etili and Sogutalan, both small towns located in the Biga District of Turkey.

The Kirazli project is currently under construction and will be operational in 2021. The project is expected to produce an average of 104,000 ounces of gold over a five-year mine life. The Ağı Dağı project is the largest investment within the province and is expected to produce an average of 177,600 ounces of gold over a six-year production life, starting in 2024. Similarly, the Camyurt project is expected to produce an average of 93,200 ounces of gold over a four-year mine life, starting in 2029.

Purpose of the Report

Ernst & Young LLP ("EY") has been engaged by Alamos Gold Inc. ("Alamos") to assess the economic benefits of Alamos projects in Turkey. The scope of this report includes the following:

- An overview of the overall Turkish economy, including the current economic state of the Çanakkale Province and the mining sector;
- An overview of Alamos projects in Turkey, including an assessment of current and projected business activity; and
- An assessment of direct and indirect economic contributions associated with Alamos operational and capital spending in the Çanakkale Province. Contributions are measured in terms of government benefits, gross spending, Gross Domestic Product ("GDP"), labour income, and full-time equivalent employment ("FTE").

Findings of the Report

To estimate the economic benefits of Alamos projects to the Çanakkale Province, EY carried out an economic contribution assessment using operational spending and capital investment information from Alamos gold mines, national accounts data from Turkish Statistical Institute, and regional macroeconomic and microeconomic information from Çanakkale.

The results suggest that Alamos operations are expected to generate **US$ 551 million** in government revenue through contributions to state royalties, forestry fees, social security, and income taxes, as shown in **Table 1.**

Table 1. Government Benefits from Alamos Gold Projects

Total Contributions	State Royalties	Forestry Fees	Social Security	Income Taxes	Total
Kirazli	41	18	22	35	116
Ağı Dağı	69	31	31	169	300
Çamyurt	28	17	23	67	135
Total	138	66	76	271	551

Notes: Figures expressed in millions and nominal US$. Contributions represent total government benefits throughout the life of the mines.
Sources: Alamos data and EY calculations.

The analysis of operational spending and capital investments related to the three Turkish mines suggests that there are substantial direct and indirect gross economic benefits related to gross spending, GDP, wages, and FTEs, as illustrated in **Table 2**.

Collectively over the thirteen years of operations, Alamos operational spending associated with the three mines is expected to generate a total of **US$ 817.5 million** in gross spending, **US$ 549.5 million** in GDP, **US$ 178.6 million** in labour income, and create a total of **1962 person-year FTEs.**

Alamos capital investments are estimated to contribute **US$ 717.8 million** in gross spending, **US$ 275.1 million** in GDP, **US$ 40.8 million** in labour income, and **1263 person-year FTEs** during the construction period of the mines.

The collective economic contribution of operational and capital spending is estimated to equate **US$ 1.54 billion** in gross spending, **US$ 824.6 million** in GDP, and **US$ 219.4 million** in labour income, and **3225 person-year FTEs** over the thirteen-year period.

Additionally, Alamos is committed to sustainable development and social responsibility, and has contributed **US$ 25 million** to infrastructure, cultural, and environmental programs, notably a water reservoir project to supply water to local communities.

Table 2. Summary of Total Economic Contributions

Contribution	Spending ($ mn)	GDP ($ mn)	Wages ($ mn)	Person-Year FTEs
OPEX				
Kirazli	194.6	145.5	67.8	654
Ağı Dağı	380.2	249.5	72.5	702
Çamyurt	242.7	154.5	38.3	606
Total	817.5	549.5	178.6	1962
CAPEX				
Kirazli	256.5	99.5	14.6	421
Ağı Dağı	432.5	163.9	23.0	531
Çamyurt	28.8	11.7	3.2	311
Total	717.8	275.1	40.8	1263

Notes: Figures for wages, GDP and output are in millions and 2019 US$. The numbers are reflective of cumulative totals of direct and indirect contributions.

Sources: Alamos data and EY calculations.

2. Current State Overview

2.1 Economic Overview of Turkey

2.2 Mining Sector in Turkey

2.3 Çanakkale

2.4 Business Activity of Alamos Gold Inc. in Çanakkale

2.1. Economic Overview of Turkey

Economic Profile

Located at the eastern end of Europe and western Asia, Turkey serves as a link between the two continents. The Turkish economy has seen significant development in recent years, with per capita GDP rising from US$ 4,200 to US$ 9,445 between 2000 and 2018.[i] The economy has become the world's 17th largest economy, owing its success to macroeconomic stability, improved relations with the European Union, and the increasing importance of the local manufacturing and services sectors. In 2016, following geopolitical tension, a market slowdown, and more generally, an unfavourable global environment, there was a slowdown in GDP growth, as further illustrated in **Table 3.**[ii] In the years proceeding 2016, an expansionary monetary policy was adopted, and together with policy stimulus, a diversified business sector positioned the country for growth. However, given recent global economic uncertainty and downside risks due to trade tensions and decreased consumer confidence, GDP for the country has been forecasted by OECD to decline in 2019, but is expected to return to an increasing trend in 2020.[iii]

Labour Market

Unemployment in Turkey has remained elevated over the past decade and was 11.2% in 2018 **(Table 3).** However, growth in the overall economy has been consistently positive, largely driven by emerging sectors and, in particular, a move away from the agriculture industry into manufacturing and services[iv], which has led to steady growth in employment across the value chain in Turkey. **Figure 1** provides an

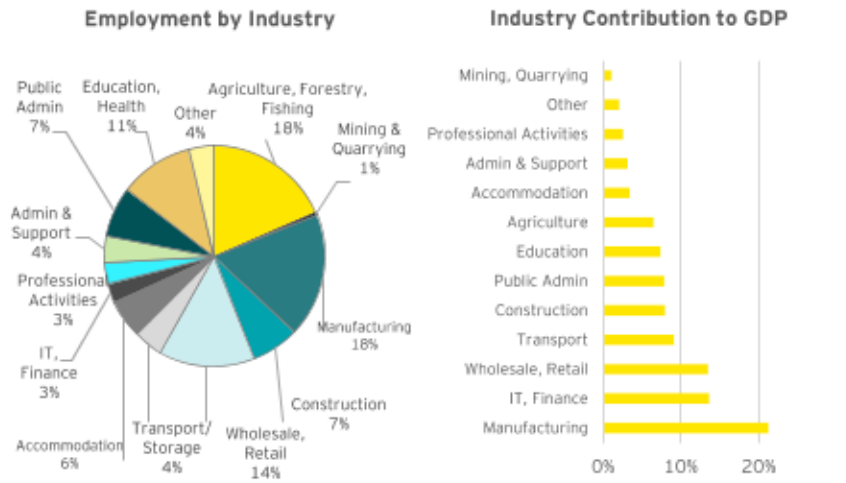
Table 3. Economic Overview - Turkey, 2010 - 2018

	2012	2013	2014	2015	2016	2017	2018
GDP (USD$ billions, 2015 prices)	712	773	813	862	890	956	980
Annual change (%)		*8.5*	*5.2*	*6.1*	*3.2*	*7.4*	*2.6*
Unemployment rate (%)	8.9	9.5	10.1	10.5	11.1	11.1	11.2
Annual change (%)		*6.6*	*5.9*	*4*	*5.7*	*0*	*0.9*
Consumer Confidence Index (CCI)	75.6	76	72.5	66.3	69.5	68.6	67
Annual change (%)		*.5*	*-4.6*	*-8.6*	*4.9*	*-1.3*	*-2.4*
Population (millions)	75.6	76.7	77.7	78.7	79.8	80.8	82.0
Annual change (%)		*1.4*	*1.3*	*1.3*	*1.4*	*1.2*	*1.5*

Notes: "Annual change (%)" is the percentage change from previous year.

Sources: Turkish Statistical Institute, OECD Economic Outlook No. 105 - May 2019

Figure 1. Industry Breakdown, 2018



Sources: Turkish Statistical Institute.

overview of industries in Turkey in 2018. The largest concentration of employment exists in two major industries: (i) Agriculture, forestry and fishing, and (ii) Manufacturing. These industries are followed by Wholesale and Retail Trade, Repair of Motor Vehicles, Education and Health, and Construction. Additionally, the largest contribution to GDP is made by (i) Manufacturing, (ii) IT and Finance, and (iii) Wholesale and Retail Trade. Although the contribution to GDP from mining and quarrying is small, recent economic outlook suggests that the industry is expected to grow in Turkey through government support, rising copper and gold prices, and upcoming key projects.[v] The increase in government support has facilitated both domestic and international investment in the mining sector through recent amendments to the mining code (2010) that helped streamline licensing processes and increased participation, thereby leading to more efficient exploration. According to BMI, Turkey's public investment fund directed towards energy and mining sectors increased to TRY 6.7 billion in 2017, and the government committed to provide funding to 53 mining projects under the 2017 Investment Program.[vi] Examples of government support in the gold mining sector include income tax reductions, exemptions on VAT and customs duties, and support for social security premiums and interest payments on loans.

Political and Business Climate

The consumer confidence index (CCI) in Turkey is used to measure the level of optimism in the local economy and is calculated from a survey carried out in cooperation with the Turkish Statistical Institute and Central Bank of the Republic of Turkey (**Table 3**). The index is prepared by making use of consumers' own assessment and expectation of the financial and economic situation, together with their saving and spending patterns. A CCI score less than 100 represents a pessimistic economic outlook.[vii] Over recent years, the annual average of the CCI has presented a pessimistic outlook and has steadily decreased, representing a decline in consumer confidence in the short-term performance of the Turkish economy.

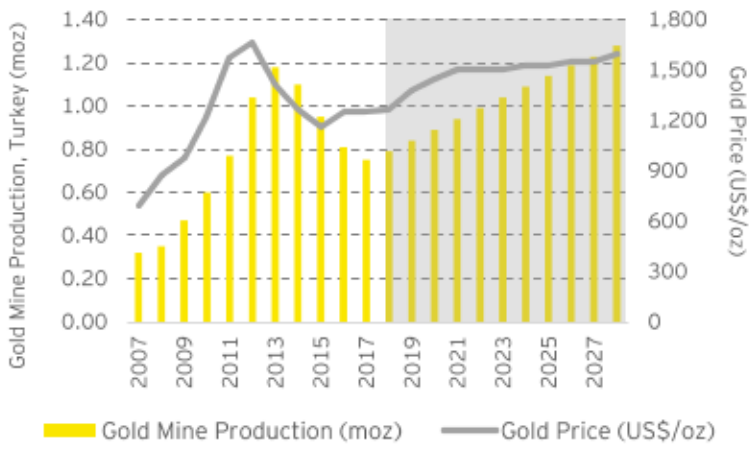
2.2. Mining Sector in Turkey

Sector Overview

The mining sector has a been a consistent contributor to the national economy. Between 1998 and 2018, the aggregate mining and quarrying sector accounted for between 0.8 and 1.1 percent of national GDP.[viii] Within the mining sector, gold has only recently become a source of local economic development but is now a consistent contributor to domestic growth. Turkey's first gold mine, Ovacik, began production in 2001, and by 2015, Turkey had become the leading producer of gold in Europe.[ix]

In 2018, gold mines in Turkey are estimated to have produced 790,000 ounces of gold, accounting for 0.8% of annual global production.

Figure 2. Local production and price of gold, 2007 - 2028



Notes: Numbers for years 2016 to 2018 represent estimates. Numbers for 2019 onwards represent forecasts.

Sources: U.S. Geological Survey (USGS), Fitch Solutions, BMI Research.

Table 4. Active Gold Mines and Development Projects

Active Mines		Upcoming New Mines	
Operation	**Owner**	**Operation**	**Owner**
Kişladağ	Tuprag/Eldorado	Ivrindi	Tümad
Çöpler	Alacer	Taç - Çorak	Güriş
Ovacık	Koza	Kirazli	Alamos
Efemçukuru	Tuprag/Eldorado	Öksüt	Centerra
Himmetdede	Koza	Hod Maden	Lidya & Sandstorm
Kaymaz	Koza	Gediktepe	Lidya & Alacer
Kestanelik	Tümad	Küçükdağ TVT	Teck
Altintepe	Bahar	Ağı Dağı , Çamyurt	Alamos
Kiziltepe	Zenit	Sisorta	Bahar
Mastra	Koza	Akarca	Çiftay
Bakirtepe	Demir Export	Halilağa	Cengiz Holdings A.Ş.
Bolkardağ	Gümüştaş		
Inlice	Esan		
Midi	Yıldız Bakır		
Sart	Pomza		

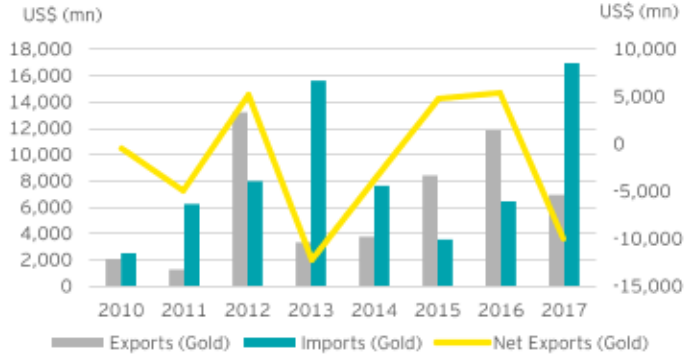
Sources: Turkish Gold Miners Association, 2018.

Production in Turkey is expected to continue to rise, alongside gold prices (**Figure 2**). By 2026, gold production is forecasted to rise to 1.19 million ounces, approximately 1 percent of projected global production. The increase in production is expected from new production from mines in Oksut (2020); Kirazli and Yenipazar (2021); Hod Maden (2022); and Gediktepe (2023).[x] **Table 4** above provides a detailed breakdown of active gold mines in Turkey in addition to mines that are expected to begin production in the future.

In addition to the presence of local reserves, the combination of strong international and local demand reflects Turkey's prominence in the global supply chain for gold.

- Gold is Turkey's second largest export after motor cars and other motor vehicles. In 2017, the total value of gold exports was US$ 6.95 billion, representing 4.2 percent of the value of all exports from Turkey that year.[xi] **Figure 3** illustrates the top 10 destinations for gold exports from Turkey in 2017.
- Turkey is also a leading consumer of gold products, accounting for approximately 6 percent of total consumer demand.[xii]
- In addition to local mine production, gold refining and recycling is a prominent feature of the industry in Turkey. Turkey's LBMA-accredited refiners are able to import considerable amounts of recycled gold from abroad (approximately 15-20t annually) to serve the local market or re-export to other countries.[xiii]
- Gold was Turkey's largest import based on total value in 2017. For instance, Turkey imported approximately US$ 17 billion of gold in 2017, accounting for 7.9 percent of its total imports.

Figure 4. Net Exports of Gold, Turkey, 2017



Sources: The Observatory of Economic Complexity.

Figure 3. Top 10 Destinations for Gold Exports, Turkey, 2017

Export Destination	Export Value (US$)	Share of Total Gold Exports
UAE	5,398,815,836	78.15%
Iraq	621,577,976	8.90%
United Kingdom	357,594,896	5.10%
Switzerland	130,767,916	1.90%
Iran	111,583,300	1.60%
Germany	62,122,831	0.89%
India	57,449,354	0.83%
Nepal	43,848,093	0.63%
Singapore	43,903,883	0.63%
Malaysia	34,102,755	0.49%

Sources: The Observatory of Economic Complexity.

This resulted in a net negative of gold exports in the country. Historical trends in the value of gold exports and net exports are displayed in **Figure 4** below.

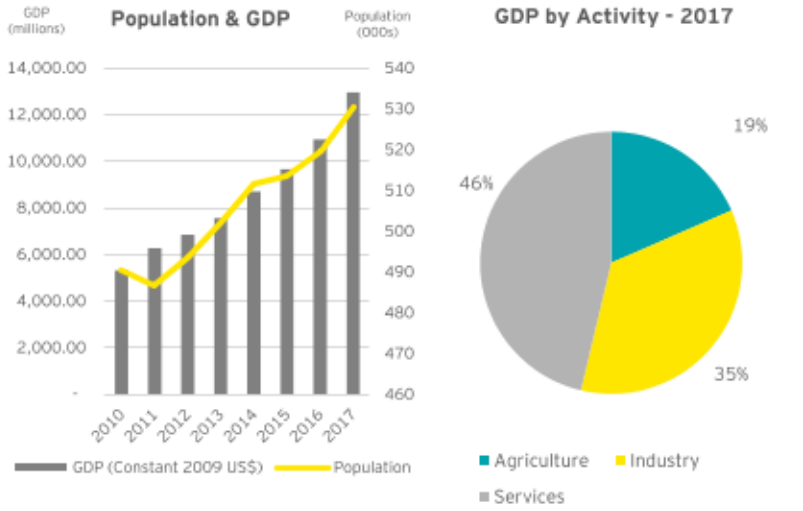
Since 2000, the discovery and prospective production of gold has attracted sizable investments in Turkey. According to the Turkish Gold Miners Association, its members have invested a total of US$ 3.0 billion into the Turkish economy, US$ 800 million of which was for mineral exploration and the remaining US$ 2.2 billion was dedicated to mining process investments.[xiv] These investments and related production are expected to have created or sustained thousands of local jobs. In 2013, the production activities of the association's members are stated to have created up to 6,000 jobs.[xv] These jobs are likely well-paid positions as the average wages for gold mine employees in Turkey are notably higher than the national average.[xvi] In addition to local job creation, mining companies often offer unique training, skills and employment opportunities as well as social and infrastructure investments within the local region.

2.3. Çanakkale

Çanakkale is one of 81 provinces in Turkey, with a total population of 540,662 as of 2018.[xvii] Situated in the northwestern region of Turkey, Çanakkale borders Europe on the west and Asia on the east. Its important geographic location is also highlighted in that its one of only six provinces in the country that have coastlines bordering the Aegean and Marmara Seas. The total GDP in the province was 12.9 billion US$, as shown in **Figure 5**. The province has a stable tourism sector with its rich history and significance in the first World War. The region also has consistent and reliable marine transportation facilities, with ferry routes running daily. Major ports in Çanakkale include the Port of Kepez, and the Karabiga Municipality Port. There are also 3 private ports in Çanakkale, namely the 2 İÇDAŞ Ports and the Port of Akçansa. In addition to its ideal geographic location and sound municipal infrastructure, the province enjoys several regional government incentives for certain industries, including tax exemptions and reductions, interest rate support, and other institutional supports.

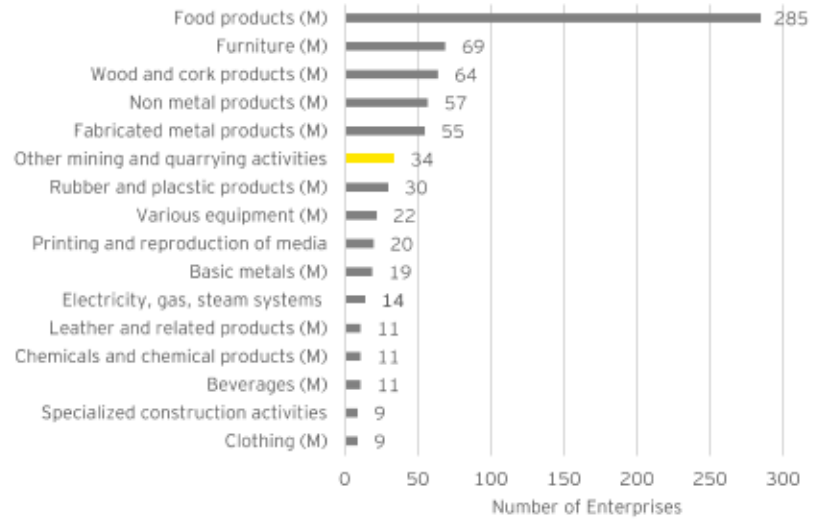
Relative to other provinces, Çanakkale is small in terms of its population and the size of the economy. The local economy has traditionally been dominated by agriculture and animal husbandry,[xviii] but over the years, the province has developed techno-parks and collaboratively invested with educational institutes. The province has two Organized Industrial Zones, and seven small industrial sites.[xix] As the provincial economy is

Figure 5. Economic Overview



Sources: Turkish Statistical Institute.

Figure 6. Production and Manufacturing Enterprise Breakdown



Notes: (M) refers to manufacturing.

Sources: The Union of Chambers and Commodity Exchanges of Turkey Industry Database.

dominated by the agriculture sector, this has paved the way for sizable investments in the food sector over the years. The food products manufacturing sector is important in the province, and is the largest contributor to employment.[xx] In addition to agriculture, Çanakkale also benefits from activities in the manufacturing sector, specifically those in basic metals, non-metallic mineral products, food, furniture, machinery repair, fabricated metal products, among others.

The industry landscape in Çanakkale is dominated by micro scaled enterprises, with the main manufacturing areas being food products, furniture, wood and cork products, non-metal products and fabricated metal products. Enterprises in mining and quarrying make up part of the industrial profile in Çanakkale, but the food production sector dominates the economy (**Figure 6**).

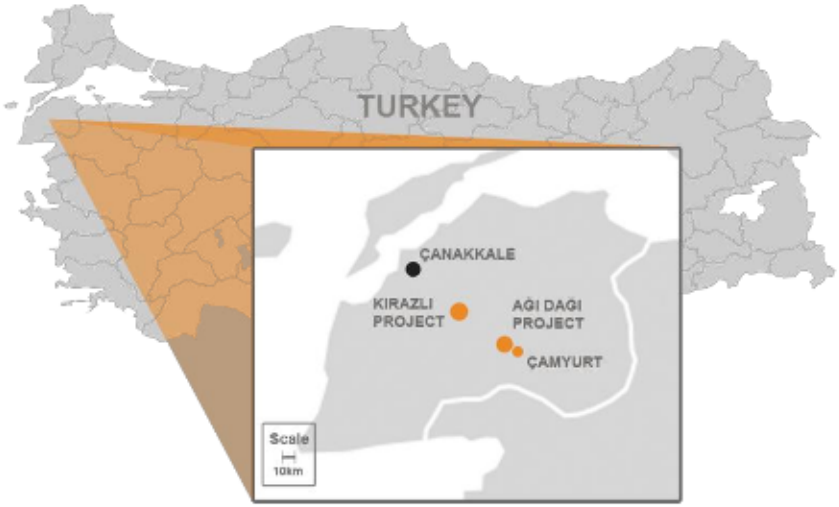
Mining Industry

Recently, the Çanakkale Province has tapped into its existing reserves of gold, as pointed out by the Turkish Gold Miners Association.[xxi] The active Lapseki mine has a combined resource of 930,000 ounces of gold.[xxii] In addition to this existing mine in the region, new projects such as Halilağa, Kirazli, Ağı Dağı and Çamyurt gold mines will increase gold extraction in the province.

2.4. Business Activity of Alamos Gold Inc. in Çanakkale

Business Overview

Alamos Gold Inc. is the owner and operator of the Kirazli, Ağı Dağı and Çamyurt gold mines, which are located in the Çanakkale Province in western Turkey. A summary of operational and capital spending is available in **Table 5**, a more detailed overview is in Appendix **A.2.** Economic benefits to the local government from the three mines are displayed in **Table 6.**



Kirazli Project

The Kirazli Project is located 25 kilometers northwest of the Ağı Dağı Project. Total construction and other capital related costs have been approximately US$ 174 million, which is a combination of both sustaining and growth capital related expenses. Likewise, total operational costs for the Project are expected to be approximately US$ 158 million, which include administrative, mining, processing and maintenance related costs. Total economic benefits from the Kirazli Project to Turkey are anticipated to be US$ 116 million annually. However, unlike the Ağı Dağı Project, most of these benefits are in the form of state sponsored royalties, which are expected to equal approximately US$ 40 million.

Table 5. Total CAPEX and OPEX for Alamos Gold Projects, 2019-2036

Project	Kirazli	Ağı Dağı	Çamyurt
Capital Spending	174	286	21
Operational Spending	158	271	168
Total	332	557	189

Notes: Figures expressed in millions and 2019 US$.
Sources: Alamos data and EY calculations.

Ağı Dağı Project

The Ağı Dağı Project represents Alamos's largest investment within the province. Construction and other capital related costs associated with the Project are expected to total US$ 286 million, while operational costs are estimated to be approximately US$ 271 million over the life of the mine. Total revenues from the Project are expected to be approximately US$ 1.43 billion, which is approximately one and a half times larger than those generated from either the Kirazli or Çamyurt Projects. Reports suggest that on a national level, total economic benefits from the Ağı Dağı Project for Turkey are approximately US$ 300 million. Of this amount, US$ 169 million is generated through

income tax contributions, followed by US $69 million in state royalties, US $31 million in forestry fees and finally US $31 million in social security and employment taxes.

Çamyurt Project

The Çamyurt Project is located approximately four kilometers southeast of the Ağı Dağı Project. Capital related costs associated with the Project are expected to total US$ 21 million, with almost two-thirds of these costs accounting for sustaining related expenses. Total operational expenses for the Project equal approximately US$ 168 million. The Project is anticipated to generate US$ 67 million in income tax revenue for Turkey, US$ 28 million in state royalties, US$ 23 million in social security and employment taxes and US$ 17 million in forestry fees annually.

Government Benefits

The three mines are estimated to contribute US$ 138 million in state royalties, US$ 66 million in forestry fees, US$ 76 million in social security, and US$ 271 million in income taxes. Total government benefits on an aggregate basis, barring any change in the company's business activities, is approximately US$ 551 million.

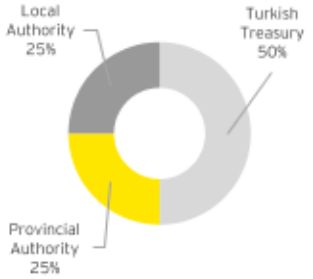
Alamos is expected to pay royalties, which are distributed between the Turkish state government, provincial government, and local communities. The respective amounts are estimated at US$ 69 million to the Treasury, US$ 34.5 million to the provincial administration, and US$ 34.5 million to the local authority of the Village Service Providing Unions (**Figure 7**).

Table 6. Government Benefits from Alamos Gold Projects

Total Contributions	State Royalties	Forestry Fees	Social Security	Income Taxes	Total
Kirazli	41	18	22	35	116
Ağı Dağı	69	31	31	169	300
Çamyurt	28	17	23	67	135
Total	138	66	76	271	551

Notes: Figures expressed in millions and nominal US$. Contributions represent total government benefits throughout the life of the mines.
Sources: Alamos data and EY calculations.

Figure 7. Distribution of State Royalties



	Turkish Treasury	Provincial Authority	Local Authority
Kirazli	20.5	10.3	10.3
Ağı Dağı	34.5	17.3	17.3
Çamyurt	14	7	7
Total	69	34.5	34.5

Notes: Figures expressed in millions and nominal US$.
Sources: Alamos data and EY calculations.

3. Economic Contribution Assessment

3.1 Methodology Overview

3.2 Economic Contribution Results

3.1. Methodology Overview

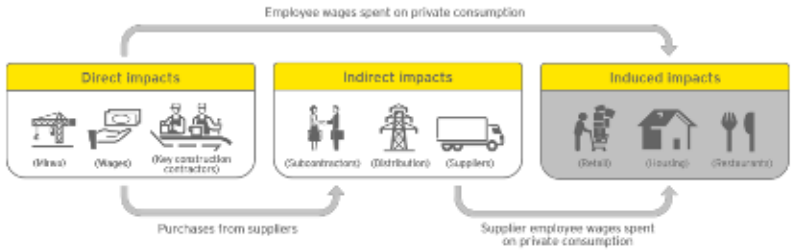
EY performed an economic contribution assessment ("ECA") using inputs from the Turkish Statistical Institute, cash spending data from Alamos and combined it with EY proprietary economic model tools, which are founded on the principles of Input-Output ("I-O") model.

Direct, Indirect, and Induced Contributions

Using the framework from the I-O model, EY estimated the economic contributions of Alamos mining operations in Turkey via three distinct channels; direct, indirect, and induced contributions. These contributions individually, and collectively represent how Alamos activities ripple throughout the provincial economy. More specifically, we define each of these contributions as follows:

- **Direct contributions** include the economic contributions supported directly by the capital and operational spending of Alamos. mining operations. These include, for example, spending on capital equipment or employee wages and benefits;
- **Indirect contributions** include the economic contributions from business activities supporting the operations of Alamos. The indirect contributions include, among other things, the contributions from suppliers' spending when purchasing goods and services from other suppliers. This could include, for example, the costs by subcontractors hired by Alamos on goods and services such as equipment and labour; and
- **Induced contributions** include the economic contributions that occur when employees that benefit from the economic activity of Alamos spend their incomes on goods and services throughout Turkey's economy. The induced activities are assumed to be primarily in service or consumer-related industries such as retail, transportation, accommodation, restaurants, housing and finance. The jobs and incomes that result from this consumer spending are also considered induced contributions. Induced contributions can be estimated based on a number of rounds or iterations of recycled income due to increased spending, economic activity, and additional income. Induced contributions are often estimated based on a number of iterations of these activities and as a result, may have a tendency to overstate the size of economic contributions, especially when the assumptions within the model may not necessarily reflect regional spending patterns (i.e., if a significant amount of the additional income is not spent within the Çanakkale Province then the economic contribution is amplified with every iteration). Although induced contributions are real economic contributions, they can be difficult to quantify, and their inclusion can potentially overstate the overall contribution of a specific event. **Therefore, induced economic contributions have been excluded from consideration for this economic contribution assessment.**

Figure 8. Example of Direct, Indirect and Induced Contributions



Sources: EY illustration.

The Model

A static I-O model has been used to assess the economic contribution of Alamos mining operation in Turkey. This method was selected due to its flexibility in providing a reliable method to assess regional contributions. The I-O model first translates direct contributions into indirect and induced economic contributions, which collectively define the total economic contribution of Alamos. These contributions will be expressed in terms of the following economic indicators:

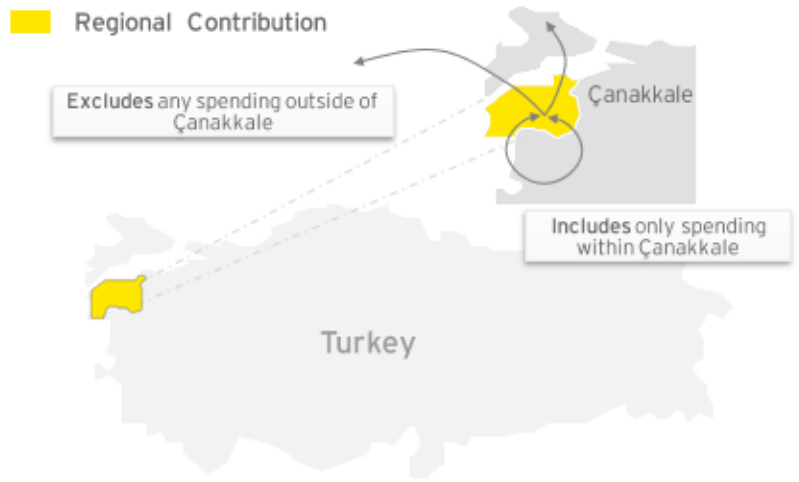
- **Gross Spending:** The total economic activity of new goods and services because of activities occurring within a particular area (i.e. the Çanakkale Province). This is a broader measure of the economy in comparison to GDP;
- **Gross Domestic Product ("GDP"):** GDP, or local value added, is a measure of the value of all final goods and services produced in a specific region;
- **Wages or labour income:** A component of the local value-added that measures total employee compensation (value of wages and benefits) and proprietor income; and
- **Full-time equivalent employment ("Person-Year FTEs"):** This refers to the total number of employee jobs that are converted to full-time equivalence based on the average full-time hours worked. This is a better estimate as it does not overstate or understate the number of jobs created. This measure does not account for those who are self-employed. Further, the FTE job metric is measured in "person-years", as in the number of hours needed for individuals to work in order be classified as such.

Economic Contribution Estimation

To estimate the total economic contribution of Alamos mining operations in Turkey, we use the Turkish Statistical Institute's most recent I-O tables from 2012. This information reflects how the Turkish Statistical Institute tracks the interdependency between all sectors in the Turkish economy. Each of these multipliers is a number that describes the size of the total economic contribution for a given level of spending. The use of the I-O tables is based on a widely accepted methodology for estimating these types of economic linkages.

To develop regional economic multipliers for the province of Çanakkale, we use data and information on industry concentrations, employment levels, and other microeconomic data from Çanakkale that reflects its local economy. More specifically, the provincial information serves as an input to the national input-output table to simulate the provincial economy. The economic multipliers developed using this methodology provide a more granular representation of how activities associated with the Ağı Dağı, Kirazli and Çamyurt Projects contribute to the Çanakkale Province, both individually and collectively.

Figure 9. Illustration of Regional Contribution



Sources: EY illustration.

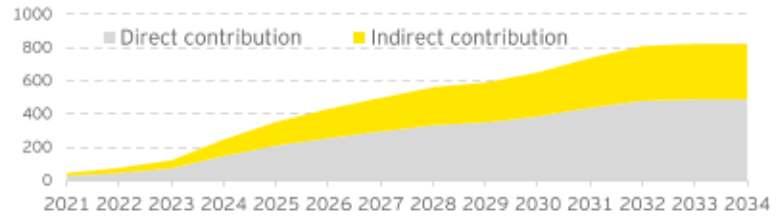
3.2. Economic Contribution Results

Contributions from Operational Spending

Results suggest that over the life of the mine, the Kirazli project is expected to contribute **US$ 194.6 million** in gross spending, **US$ 145.5 million** in GDP, **US$ 67.8 million** in labour income, and sustain **654 person-year FTEs**. Additionally, over its lifetime of six years, the Ağı Dağı mine is expected to contribute **US$ 380.2 million** in gross spending, **US$ 249.5 million** in GDP, **US$ 72.5 million** in labour income, and **702 person-year FTEs**. Similarly, for Çamyurt project, the total contribution over the life of the mine is estimated to be **US$ 242.7 million** in gross spending, **US$ 154.5 million in GDP**, **US$ 38.3 million** in labour income, and **606 person-year FTEs**.

Figure 10 illustrates total economic contribution to gross spending from Alamos Turkish projects. Direct contributions include direct spending of Alamos mining operations, whereas indirect contributions include economic contributions from business activities supporting the operations of Alamos within the province of Çanakkale. Over thirteen years of operations, Alamos is expected to produce a total contribution of **US$ 817.5 million** in spending, **US$ 549.5 million** in GDP, **US$ 178.6 million** in labour income, and sustain **1962 person-year FTEs**.

Figure 10. Cumulative OPEX Contributions ($ mn)



Sources: Alamos data and EY calculations.

Table 7. Summary of Contributions from Operational Spending

Project	Spending ($ mn)	GDP ($ mn)	Wages ($ mn)	Person-Year FTEs
Kirazli				
Direct	115.3	91.3	42.9	383
Indirect	79.3	54.2	24.9	271
Total	194.6	145.5	67.8	654
Ağı Dağı				
Direct	225.3	156.6	45.9	411
Indirect	154.9	92.9	26.6	291
Total	380.2	249.5	72.5	702
Çamyurt				
Direct	143.8	97.0	24.2	355
Indirect	98.9	57.5	14.1	251
Total	242.7	154.5	38.3	606
Total Direct	484.4	344.9	113.1	1149
Total Indirect	333.1	204.7	65.6	814
Total Contribution	817.5	549.5	178.6	1962

Notes: Figures for wages, GDP and gross spending are in millions and 2019 US$. Figures represent cumulative contributions.
Sources: Alamos data and EY calculations.

Contributions from Capital Investments

The total contribution associated with the capital investment of the Kirazli mine is estimated at **US$ 256.5 million** in gross spending, **US$ 99.5 million** in GDP, **US$ 14.9 million** in labour income, and **421 person-year FTEs**. The total contribution associated with the capital investment of the Ağı Dağı mine is expected to be **US$ 432.5 million** in gross spending, **US$ 163.9 million** in GDP, **US$ 23 million** in labour income, and **531** person-year FTEs. Similarly, for the Çamyurt mine, total contribution from its capital investment is estimated at **US$ 28.8 million** in gross spending, **US$ 11.7 million** in GDP, **US$ 3.2 million** in labour income, and **311 person-year FTEs**.

Total economic contribution associated with the capital investment of the three projects is estimated to be **US$ 717.8 million** in gross spending, **US$ 275.1 million** in GDP, **US$ 40.8 million** in labour income, and **1263 person-year FTEs**.

Social Contributions

Between 2010 and 2018, Alamos made significant investments in the province of Çanakkale, totalling over **US$ 25 million**. These contributions included infrastructure, cultural, and environmental programs. The Alamos water reservoir project is designed to support the Kirazli project needs and to supply clean potable water to the local communities. Alamos is also actively investing in environmental initiatives, which include water improvement and tree planting. Additionally, by investing in scholarships, Alamos is supporting a positive contribution to human capital development locally. Alamos demonstrates its commitment to social responsibility in the local communities by organizing village festivals, and mine and culture tours. This inflow of spending also creates direct and indirect economic spinoffs in the form of gross spending, GDP, job creation and labour income, which further contribute positively to local communities and support local economic development initiatives that help sustain the future prosperity of Çanakkale.

Table 8. Summary of Contributions from Capital Investments

Project	Spending ($ mn)	GDP ($ mn)	Wages ($ mn)	Person-Year FTEs
Kirazli				
Direct	164.9	65.0	8.9	275
Indirect	91.6	34.5	5.7	146
Total	256.5	99.5	14.6	421
Ağı Dağı				
Direct	278.0	107.1	8.5	346
Indirect	154.5	56.8	14.5	185
Total	432.5	163.9	23.0	531
Çamyurt				
Direct	18.5	7.6	2.0	203
Indirect	10.3	4.1	1.2	109
Total	28.8	11.7	3.2	311
Total Direct	461.4	179.7	19.4	824
Total Indirect	256.4	95.4	21.4	441
Total Contribution	717.8	275.1	40.8	1263

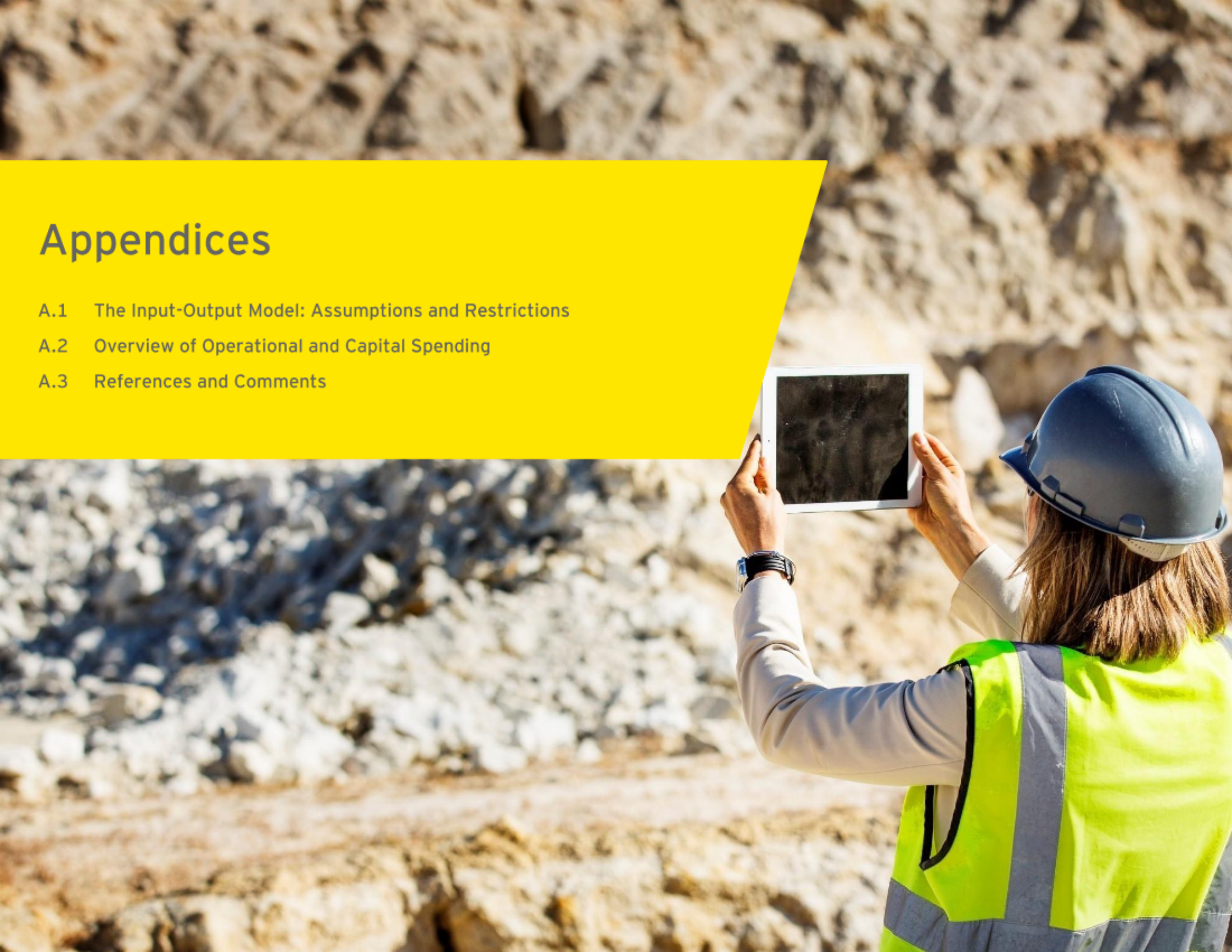
Notes: Figures for wages, GDP and output are in millions and 2019 US$.
Figures represent cumulative contributions.
Sources: Alamos data and EY calculations.

Table 9. Social Contributions

Program	Contribution (US $)
Village Infrastructure	246,219
Scholarships	125,236
Water Improvement	108,228
Village Festivals	52,181
Mine and Culture Tours	39,813
Tree Planting	27,057
Sponsorships	4,638
Major Community Infrastructure Projects	24,544,620
Total Contribution	25,147,992

Notes: Currency conversion from Turkish Lira using 2010-2018 average exchange rate.
Sources: Alamos data and EY calculations.

Appendices



A.1 The Input-Output Model: Assumptions and Restrictions

The following appendix outlines the assumptions and restrictions associated with the I-O model used to perform the economic contribution assessment in this Report. The I-O model is subject to limitations both in concept and implementation. Like any economic model, the I-O model is conceptually an abstraction which attempts to be complex enough to accurately capture and estimate the most significant contributions to the real-life economy caused by economic activity, yet simple enough to be analytically and intuitively meaningful.

An I-O model reflects the observed interdependency between all sectors of the economy. For Turkey, the Turkish Statistical Institute reports for 64 industrial sectors in the economy: (1) how each sector relies on the other 63 sectors for inputs to their production; and (2) how each sector supplies its products and services to each of the remaining 63 sectors. While an I-O model provides a consistent and innovative way of measuring the economic effects of an economic activity, one should be aware of the assumptions and limitations imposed on the models underlying approach. Some of these assumptions include:

- The relationship between industry inputs and outputs is linear and fixed, meaning that a change in demand for the outputs of any industry will result in a proportional change in production;
- The model assumed constant returns to scale, and cannot account for economies/diseconomies of scale or structural changes in production technologies, an assumption which does not necessarily hold in the actual economy;
- Prices are fixed in the model; thus, the model is unable to account for elasticities, or more formally, how one economic variable change in response to another;
- I-O models are static, and therefore do not consider the amount of time required for changes to happen. Changing the timeframe would not affect the magnitude of the estimates;
- There are no capacity constraints, and all industries are operating at full capacity. This implies that an increase in output results in an increase in demand for labour (rather than simply re-deploying existing labour). It also implies that there is no displacement that may occur in existing industries as new projects are completed;
- I-O models assume that the technology and resource mix (ratios for inputs and production) is the same for all firms within each industry. As such, our analysis describes industry average effects;
- The model assumes that the structure of the economy remains unchanged, and any structural changes in the economy since 2012 will therefore lead to changes to the multipliers, which could be implemented once the Turkish Statistical Institute release updated input-output tables. As such, the more removed the year of analysis is from the year of the used input-output tables, the greater the uncertainties;
- The model does not consider the economic contributions or opportunity costs associated with using resources elsewhere. In the case of this analysis for example, funds used to construct new facilities may by allocated to other areas. Using these funds for alternative uses would generate their own economic contributions, which could potentially be larger or smaller. However, the model will not be able to capture this;
- Results from the I-O model should not be interpreted as causal contributions; and

- The model does not consider substitutions amongst inputs, and that each industry in the model is regarded as having a single production process. For this analysis, the model will not be able to account for supplier or material changes that may occur during the construction phases related to a price change, etc.

As per the assumptions above, the structure and limitations of I-O models lend themselves to measuring the contributions of projects that are shorter term in nature; generally, they are used to look at shocks to the economy. For long term analysis, time series and general equilibrium models are more appropriate.

A.2 Overview of Operational and Capital Spending

Table 10 and **Table 11** display operational and capital spending associated with Alamos projects in Turkey.

Table 10. Summary of Operational Spending

Project	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	Total
Kirazli	34.0	27.1	35.7	31.8	25.6	4.1	0	0	0	0	0	0	0	158.3
Ağı Dağı	0	0	0	58.9	53.8	50.8	48.3	44.9	14.5	0	0	0	0	271.2
Çamyurt	0	0	0	0	0	0	0	0	7.3	43.0	58.1	49.8	9.8	168
Total	34	27.1	35.7	90.7	79.4	54.9	48.3	44.9	21.8	43.0	58.1	49.8	9.8	597.5

Notes: Figures are in millions and 2019 US$. Numbers have been rounded.

Sources: Alamos data and EY calculations.

Table 11. Summary of Capital Investments

Project	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	Total
Kirazli	69.7	79.2	0.6	7.1	3.4	1.1	1.1	3.4	2.9	2.8	2.8	0	0	0	0	0	0	174.1
Ağı Dağı	0	0	3.8	84.7	145	1.8	10.0	1.9	2.1	7.0	6.6	7.9	7.7	7.6	0	0	0	286.1
Çamyurt	0	0	0	0	0	0	0	0	0	0	8.5	1.0	1.0	1.0	4.5	2.3	2.2	20.5
Total	69.7	79.2	4.4	91.8	148.7	2.9	11.1	5.3	5.0	9.8	17.9	8.9	8.7	8.6	4.5	2.3	2.2	480.7

Notes: Figures are in millions and 2019 US$. Numbers have been rounded. End of the mine capital spending is associated with rehabilitation spend.

Sources: Alamos data and EY calculations.

A.3 References and Comments

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