

STATE OF VERMONT
PUBLIC UTILITY COMMISSION

Case No. 21-1107-PET

Petition of GLOBALFOUNDRIES U.S. 2 LLC for)
a Certificate of Public Good Pursuant to 30 V.S.A.)
§ 231 to Operate a Self-Managed Utility)

DIRECT TESTIMONY OF

JEFFREY B. CARR, STATE ECONOMIST of the Agency of Administration of the
ADMINISTRATION of GOVERNOR PHILIP SCOTT

On Behalf of the AGENCY OF COMMERCE AND COMMUNITY DEVELOPMENT

JUNE 25, 2021

Summary of Testimony

STATE ECONOMIST Jeffrey B. Carr describes the results of a Scott Administration-Legislative Joint Fiscal Office consensus estimate of the State economic and fiscal impacts of the economic activities of the GLOBALFOUNDRIES-U.S. 2 LLC facility in Essex Junction-Williston, Vermont

1 **Q 1. Please state your name, occupation, and business address.**

2 A.1. My name is Jeffrey B. Carr. I am President and Senior Economist at Economic & Policy
3 Resources, Inc. (“EPR”), an applied economics consulting firm located at 400 Cornerstone
4 Drive, Suite 310, in Williston, Vermont.

5 **Q 2. What is your current consulting relationship with the State of Vermont?**

6 A.2 For more than 30 years, I have served as consulting State Economist for the Agency of
7 Administration. For roughly 20 of those years, I also have served in a consulting capacity
8 to the Vermont Agency of Commerce and Community Development on matters ranging
9 from economic development policy to technical assistance for matters relating to economic
10 incentives policy and economic incentives applications review-management under the
11 umbrella of the Vermont Economic Progress Council. I also have provided technical
12 assistance to the Vermont Department of Economic Development on several matters of the
13 past 20 or so years. In addition, our firm has also had a longstanding, consulting association
14 to provide technical assistance to the Office of the State Treasurer regarding matters related
15 to Vermont’s issuance of General Obligation Bonds (debt), which also has included
16 providing technical support services to the State’s Capital Debt Affordability Advisory
17 Committee (known as “CDAAC”) since its creation in the 1990s by the Vermont General
18 Assembly.

19 **Q 3. What is the purpose of your testimony?**

20 A 3. I am testifying about the results of a Scott Administration-Vermont Legislative Joint Fiscal
21 Office consensus estimate of the net economic and fiscal impact of the
22 GLOBALFOUNDRIES-U.S. 2 LLC facility (“GLOBALFOUNDRIES”) on the State of

1 Vermont. This analysis was completed in March of calendar year 2020—or just prior to
2 the onset of the COVID-19 pandemic in Vermont. Although not published nor formally
3 released, this analysis represented one of the most in-depth reviews of the economic impact
4 of GF in the State of Vermont in the past 30 years.¹ The purpose of my testimony is to
5 provide objective facts and information to this proceeding regarding the aggregate “net”
6 economic and fiscal impact of the GLOBAL FOUNDRIES facility’s economic activities
7 in the State of Vermont.

8 **Q 4. Please summarize your experience and educational background?**

9 A 4. I received a B.S. in Animal Sciences from the University of Vermont in 1978 and an M.S.
10 in Agricultural Economics from the University of Vermont in 1980. Following my
11 graduation, I worked for roughly four years in the Office of Policy Research and
12 Coordination in the first Administration of Governor Richard A. Snelling. Following that
13 service, I worked as Director of Research for a campaign for the U.S. Senate and worked
14 for two and one-half years on the Washington, D.C. staff for a member of the U.S. Congress
15 from the State of Michigan as Legislative Director. Following that term of service through
16 mid-1989, I returned to Vermont to join my current firm on a full-time basis. While at
17 EPR, I have completed over 500 assignments on a wide variety of applied economics
18 matters for a wide variety of clientele—including private sector businesses, developers,
19 industry trade associations, state and local governments, non-governmental organizations

¹ This work was performed at the request of the Agency of Commerce and Community Development and the Joint Fiscal Office in connection with possible economic development legislation associated with so-called “anchor businesses.” The pandemic superseded consideration of this legislation and analysis. Although the consensus analysis should be considered preliminary, and there was no written presentation of the analysis performed, it was largely complete.

1 (or “NGOs”), and attorneys. Our assignments have ranged from formal “consensus”
2 forecasts of state and local tax, fee and other revenues to economic impact assessment
3 studies in a wide variety of settings—including for New Markets Tax Credit studies and
4 for federal employment- based immigration programs.

5 In addition, I have been involved with litigation consulting assignments and providing
6 expert witness testimony in personal injury, wrongful death, wrongful termination, and
7 business loss cases throughout my career at our firm. I also have presented expert witness
8 testimony regarding economic impact assessment analyses of development projects and
9 their operations in 48 of the 50 states before U.S. Citizenship and Immigration Service case
10 officers for roughly 250 immigration case assignments under the EB-5 Immigrant Investor
11 Visa program. I also have provided expert witness testimony in more than 25 temporary
12 U.S. visa proceedings before U.S. Citizenship and Immigration Services case adjudication
13 officers involving L-1 visa petitioners and E-2 entrepreneur visa petitioners. I also
14 provided expert witness testimony in roughly half a dozen fact-finding proceedings
15 regarding labor contract negotiation proceedings—including assisting with the
16 presentation of cases in mediation proceedings and in proceedings before the Vermont
17 Labor Relations Board.

18 Lastly, I also have provided expert witness testimony in numerous Act 250 proceedings
19 where I provided expert witness testimony with respect to a development project’s or
20 Master Plan’s public benefits and public costs impact. My expert witness testimony
21 experience also includes testimony before the forerunner of this Public Utilities
22 Commission regarding the economic impacts associated with an Act 248 “Certificate of

1 Public Good” proceeding which was presented before the Vermont Public Service Board
2 in 2013.

3 **Q 5. Please describe the results of the consensus economic and fiscal impact assessment of**
4 **the GLOBAL FOUNDRIES facility on the State of Vermont?**

5 A 5. The results of the consensus estimate of state economic and fiscal impact analysis of the
6 GLOBAL FOUNDRIES facility demonstrates that the company is a major “net” economic
7 and fiscal contributor to the State of Vermont (see Exhibit Table-1, below). For example,
8 the economic activities of GLOBAL FOUNDRIES’ more than 2,000 direct employees at
9 its Essex Junction facility supported a total of 5,333 total employment opportunities in the
10 State in 2020, and a total of 5,059 private sector employment opportunities in the State—
11 also in 2020. The GLOBAL FOUNDRIES facility’s economic activities also contributed
12 a total of \$0.535 billion in Gross Domestic Product in the State, a total of \$375 million in
13 Personal Income, and a total of \$328 million in Disposable Personal Income—
14 corresponding to Total Personal Income less Taxes. Those above-listed economic
15 contributions define GLOBAL FOUNDRIES as the largest private sector, for-profit
16 employer in the State of Vermont. Published sources also position GLOBAL
17 FOUNDRIES as the largest employer in Vermont except for the University of Vermont
18 Medical Center—with an estimated 5,591 employees—and the University of Vermont—at
19 an estimated 3,991 employees—using the November 2020 edition of Vermont Business
20 Magazine published employment counts. The only other comparable and larger employer
21 in the State is the State of Vermont, itself—with an estimated 8,452 total employees as of
22 June 2021—a number roughly four times the GLOBAL FOUNDRIES headcount total.

1 As a percentage of the Vermont State total (see Exhibit Table-2, below), this consensus
 2 estimate found that the GLOBAL FOUNDRIES facility’s economic activities contributed
 3 1.2% to the State’s total employment base in 2020—including an estimated 1.3% of the
 4 State’s private sector employment base—and 1.6% of Vermont’s total Gross State Product
 5 in 2020. The economic activities of the GLOBAL FOUNDRIES facility also comprised
 6 an estimated 1.0% of the State’s Total Personal Income and Disposable Personal Income
 7 in 2020. The consensus estimate also showed that the economic activities associated with
 8 the GLOBAL FOUNDRIES facility accounted for 1.6% of the State’s Value Added
 9 production in 2020.

**Exhibit Table-1: State Economic and Fiscal Contribution of the
 GLOBAL FOUNDRIES Facility to Vermont in 2020**

Category	Year	
	Units	2020
Total Employment Impact	Individuals (Jobs)	5,333
Private Non-Farm Employment	Individuals (Jobs)	5,059
Residence Adjusted Employment	Individuals	5,116
Gross Domestic Product	Millions of Fixed (2020) Dollars	535
Output	Millions of Fixed (2020) Dollars	787
Value-Added	Millions of Fixed (2020) Dollars	535
Personal Income	Millions of Fixed (2020) Dollars	375
Disposable Personal Income	Millions of Fixed (2020) Dollars	328
Real Disposable Personal Income	Millions of Fixed (2012) Dollars	292
Summary of Fiscal Benefits	Thousands of 2020 Dollars	\$ 35,822.8
Summary of Fiscal Costs	Thousands of 2020 Dollars	\$ 32,252.5
Difference-Fiscal Benefits v. Costs	Thousands of 2020 Dollars	\$ 3,570.3
Source: Consensus Administration-JFO Preliminary Assessment 02/25/20		

**Exhibit Table-2: State Economic Contribution of the GLOBAL FOUNDRIES
 Facility in Vermont as a Percent of the Vermont Total**

Category	Units	2020	% of VT
Total Employment	Individuals (Jobs)	450,477	1.2%
Private Non-Farm Employment	Individuals (Jobs)	382,426	1.3%
Residence Adjusted Employment	Individuals	449,916	1.1%
Gross Domestic Product	Millions of Fixed (2012) Dollars	33,517	1.6%
Output	Millions of Fixed (2012) Dollars	54,942	1.4%
Value-Added	Millions of Fixed (2012) Dollars	33,517	1.6%
Personal Income	Millions of Current Dollars	36,936	1.0%
Disposable Personal Income	Millions of Current Dollars	33,233	1.0%
Real Disposable Personal Income	Millions of Fixed (2012) Dollars	28,157	1.0%
Real Disposable Personal Income per Capita	Thousands of Fixed (2012) Dollars	45	Not Meaningful
Source: Consensus Administration-JFO Preliminary Assessment 02/25/20			

Those previously-listed, economic contributions are significantly larger than the direct employment of roughly 0.8% of the State nonfarm payroll jobs total for calendar year 2020 as indicated by employment estimates published by the Vermont Department of Labor’s Current Employment Statistics Program—at an estimated annual average of 286,775 jobs for the Vermont economy in calendar year 2020. Those proportionally larger—in comparison to the direct employment level—economic contribution percentages are a testament to the higher than the State average paying jobs that are on the payroll of GLOBAL FOUNDRIES facility.

Given the higher than average paying nature of the job opportunities at the GLBOAL FOUNDRIES facility, and the out-sized, positive economic contribution of that GLOBAL FOUNDRIES’ economic activities have on the Vermont economy, it also is very likely that the economic activities associated with the GLOBAL FOUNDRIES Essex Junction

1 facility also makes an out-sized, positive contribution to the State’s fiscal resources as well.
2 This is in fact implied by the 2020 estimate of GLOBAL FOUNDRIES’ annual fiscal
3 contribution to the State. This consensus estimate found that the facility’s economic
4 activities contributed a gross total of \$35.82 million in fiscal benefits to the State in 2020.
5 “Net” of the State fiscal costs attributable to the GLOBAL FOUNDRIES facility’s
6 operations—estimated at \$32.25 million in 2020—the GLOBAL FOUNDRIES facility’s
7 “net” positive fiscal contribution to the State totaled an estimated \$3.57 million in 2020.

8 **Q 6. If the economic activities at the GLOBAL FOUNDRIES facility were to be curtailed**
9 **significantly—either by a re-location of substantial portions of its existing production**
10 **activities to other locations outside of Vermont or by a possible closure of the**
11 **facility—what impact would that action have on the Vermont economy?**

12 A 6. As a major Vermont employer, that scenario would clearly have a large and negative
13 impact on the Vermont economy and the State’s fiscal condition. Just how large the
14 negative impact will be will depend on many factors—including the specifics of any
15 reduction in economic activities, up to and including a possible closure process. Key
16 considerations would also include the nature of and level of any residual activity that might
17 remain at the facility going forward and would also depend on what economic activities
18 might arise over time to replace those lost jobs at the facility.

19 At least initially, the loss of more than 2,000 direct employment opportunities at the
20 GLOBAL FOUNDRIES facility in the northwest part of the State would be large and
21 negative. However, numerous studies in the literature on plant facility and military base

1 closures over the last 30 years indicate that there will be some “residual economic activity”
2 that remains even if the subject employer’s operations cease entirely. For example, the real
3 estate associated with the plant does not disappear, and a responsible party will clearly need
4 to pay State Education Property Taxes on the facility. In addition, at least some of the
5 facility’s workforce will be retained in-state, and will be productive—potentially employed
6 at a replacement company or companies that might be recruited to occupy the suddenly
7 available production space—in a part of the State where manufacturing job growth is
8 already being adversely impacted by a lack of available and develop-able manufacturing
9 sites which are needed to support the possible expansion of the northwest Vermont region’s
10 manufacturing job base.

11 Recognizing the shortcomings of just assuming a plant closure would result in the total or
12 near total loss of the GLOBAL FOUNDRIES’ economic and fiscal contributions described
13 above, the Scott Administration and the Legislative Joint Fiscal Office economists
14 undertook a consensus analysis of the potential closure of the GLOBAL FOUNDRIES
15 facility in Essex Junction-Williston relative to a “Status quo” baseline level of economic
16 and fiscal activity in Vermont.

17 **Q 7. What did that consensus 2020-2030 economic and fiscal impact assessment analysis**
18 **show?**

19 A 7. For the “Significant Plant Reduction/Possible Closure” scenario, estimated plant
20 employment reduction impacts are significant (see Exhibit Table-3 below). However, as
21 with all plant closure scenarios, these losses do not approach “zero” in any given year—

1 since residual activity would be expected to continue at the GLOBAL FOUNDRIES
 2 facility site—despite the significant production reductions and/or closure. Direct and
 3 indirect net job reductions, net of re-absorption of displaced workers (likely at lower
 4 compensation levels), total over roughly 1,200 lost jobs by 2030 as indirect and induced
 5 economic impacts would be higher as most of the GLOBAL FOUNDRIES’ employees
 6 continue to reside (and therefore spend most of their personal income) within the State of
 7 Vermont.

8 **Exhibit Table-3: Summary State Economic Impacts (Including Residual Activity) 2020-30**

Summary-Facility Closure 2020-2030 [Net Change versus Baseline]					
Comparison Type		Forecast			
Differences		GF Shutdown 2025-2028-Version "New-New"			
		Year			
Category	Units	2020	2025	2030	
Total Employment	Thousands (Jobs)	0.000	-0.271	-1.187	
Private Non-Farm Employment	Thousands (Jobs)	0.000	-0.257	-1.071	
Residence Adjusted Employment	Thousands	0.000	-0.260	-1.135	
Population	Thousands	0.000	-0.081	-0.944	
Labor Force	Thousands	0.000	-0.056	-0.613	
Gross Domestic Product	Billions of Fixed (2012) Dollars	0.000	-0.029	-0.140	
Output	Billions of Fixed (2012) Dollars	0.000	-0.043	-0.204	
Value-Added	Billions of Fixed (2012) Dollars	0.000	-0.029	-0.140	
Personal Income	Billions of Current Dollars	0.000	-0.026	-0.158	
Disposable Personal Income	Billions of Current Dollars	0.000	-0.023	-0.137	
Real Disposable Personal Income	Billions of Fixed (2012) Dollars	0.000	-0.017	-0.083	
Real Disposable Personal Income per Capita	Thousands of Fixed (2012) Dollars	0.000	-0.020	-0.050	
PCE-Price Index	2012=100 (Nation)	0.000	-0.002	-0.049	

1 From a fiscal impact perspective and under the “Plant Reduction/Possible Plant Closure”
2 scenario, the consensus estimate is for an initial estimate of net State fiscal impacts
3 cumulatively total -\$8.1 million through calendar year 2030 (see Exhibit Table-4 below).
4 On a year-to-year basis, net fiscal impacts range from a low of approximately -\$1.2 million
5 in fiscal year 2026 to a maximum annual net fiscal loss of roughly -\$1.9 million in calendar
6 year 2028.

7 **Exhibit Table-4: Summary State Fiscal Impacts by Fund, 2020-30**

GLOBAL FOUNDRIES-"Net" Fiscal Benefit-Cost Impact				'20-'30 Cumm.
	2020	2025	2030	Total
	0	5	10	
Total Revenues By Fund:				
General Fund (\$000s)	\$0.0	(\$1,235.4)	(\$4,847.8)	(\$19,289.4)
Transportation Fund (\$000s)	\$0.0	(\$183.3)	(\$1,366.5)	(\$4,336.0)
Education Fund (\$000s)	\$0.0	(\$567.5)	(\$72.4)	(\$1,726.4)
Total Revenues (\$000s)	\$0.0	(\$1,986.2)	(\$6,286.7)	(\$25,351.8)
Total Costs By Fund:				
General Fund (\$000s)	\$0.0	(\$249.3)	(\$3,298.9)	(\$10,464.4)
Transportation Fund (\$000s)	\$0.0	(\$42.1)	(\$557.2)	(\$1,767.4)
Education Fund (\$000s)	\$0.0	(\$137.4)	(\$1,714.2)	(\$4,983.6)
Total Estimated Costs (\$000s)	\$0.0	(\$428.7)	(\$5,570.3)	(\$17,215.5)
Net Difference (\$000s)	\$0.0	(\$1,557.5)	(\$716.3)	(\$8,136.3)

8
9

1 **Q 8. How did you go about measuring the impact of a plant closure-like reduction in**
2 **economic activities at the GLOBAL FOUNDRIES facility?**

3 A 8. The analysis included several steps. The first step was to decide upon and calibrate the
4 underlying core economic impact measurement model and a fiscal impact measurement
5 model. This was followed by the development of a reasonable set of economic impact
6 model inputs, and the final tabulation of impact model results (both economic and fiscal)
7 into a coherent set of tables to appropriately describe the impact study results.

8 More specifically, the core economic model used to develop economic contribution impact
9 estimates was developed by Regional Economic Models, Inc. (REMI)—which is widely
10 used throughout Vermont State government. The model is maintained by the Legislative
11 Joint Fiscal Office for analytic work associated with legislative economic and fiscal
12 analyses. It is also regularly used by the Department of Public Service and the Vermont
13 Economic Progress Council (“VEPC”), and occasionally has been used by ACCD-Agency
14 of Administration for consideration of specific policy initiatives. The fiscal impact model
15 part of this analysis used the current fiscal impact model as maintained by VEPC to
16 evaluate applications for State economic incentives under the Vermont Employment
17 Growth Incentive Program. Because the VEPC fiscal cost-benefit model was a five-year
18 model, this analysis extended the model out another five years for this consensus fiscal
19 impact assessment analysis, and the Statewide Property Tax impact portion of the VEGI
20 model was disabled for use in this analysis because there would likely be “no difference”
21 in property tax payments to the State over the period since some property owner of record

1 would still be required to continue making State Education Tax payments even under a
2 scenario where manufacturing operations had largely ceased.²

3 Model inputs for this impact assessment were derived from a wide range of sources. Source
4 data on GLOBAL FOUNDRIES' recent economic activities included information directly
5 provided by GLOBAL FOUNDRIES itself—including historical and near-term future
6 operations, its employment levels, its payroll taxes and corporate income taxes paid to the
7 State, the demographic make-up of its current work force, its recent capital investment
8 activity and other recent business expenditures (e.g. property tax payments and payments
9 to key vendors—including utility expenditures). These data were cross-checked with
10 various data sources, including data from the Vermont Department of Labor, other
11 independent publicly reported analyses,³ other regional economic models, and data from
12 the Vermont Department of Taxes. Receipt of this very detailed information improved the
13 accuracy of this analysis because the consensus impact analysis was able to make several
14 data-informed calibration changes to the underlying REMI model baseline in order to have
15 the underlying REMI baseline be more reflective of the specific circumstances of this key
16 regional Vermont employer rather than being limited to only using industry averages.⁴

² Since property owner—whoever that might be over time—would still need to make State education property tax payments since the real estate would still remain—even under a complete suspension of all production activities at the GLOBAL FOUNDRIES site.

³ Including other public bodies within the State of Vermont.

⁴ For example, the average compensation level of workers on the payroll of the first sample regional employer's industry sector was trued up to the industry average employee compensation in this analysis for this employer's industry category in the REMI model to so as to not exaggerate the income effects—up or down—under the alternative scenario evaluated.

1 The final step in this first round economic-fiscal contribution-impact analysis process was
2 the computation of all direct and indirect state revenues and costs associated with the
3 constructed plant closure scenario. This was completed using an expanded version of the
4 VEGI fiscal cost/benefit model as maintained by the Vermont Economic Progress Council
5 (VEPC)—but expanding it from a five-year model to a ten-year assessment model as
6 described above. The VEGI fiscal cost/benefit model is a proven fiscal impact model,
7 whose structure has been successfully employed for the past twenty years—with
8 appropriate periodic modifications and annual updates. The VEGI fiscal cost/benefit
9 model was approved by the Joint Fiscal Committee and also has undergone several audits
10 by the State Auditor of Accounts, and the Vermont Legislative Joint Fiscal Office. Minor
11 modifications were made, where appropriate, to adapt the VEGI fiscal cost/benefit model
12 for assessing the State fiscal contributions-impacts associated with the plant closure
13 scenario. It also should be noted that the “expanded” version of the VEGI fiscal
14 cost/benefit model that was employed in this consensus impact assessment analysis was
15 also reviewed by an economist in the Vermont Department of Taxes in February of 2020.

16 To complete this step in the consensus impact assessment analysis, several dozen REMI
17 impact model outputs for the plant closure scenario (and in construction to the “status quo”
18 baseline) were utilized to estimate State revenues and State costs for the General Fund,
19 Transportation Fund, and Education Fund. These REMI outputs included variables such
20 as the change in State Personal Income, the change in State Private Sector Employment,
21 the change in the State Population, the change in the State School Age Population, the
22 change in roughly a dozen classifications of State Consumer Expenditures (and the change

1 in those expenditure items' relative prices under each scenario), among other key economic
2 variables. Using these economic impacts and their relationship to State revenues and State
3 costs, estimates of changes in the State's revenues and costs under each scenario were
4 developed through calendar year 2030.

5
6 The last step in the fiscal impact estimating process involved taking those year-to-year
7 changes in State revenues and State costs and discounting them to a "present value" dollar
8 amount, assuming a 3.1% discount rate (that of a Triple A, 20-year municipal bond per the
9 Moody's Analytics December 2019 U.S. macroeconomic forecast interest rate; Denoted
10 by the Moody's Analytics U.S. macro-model mnemonic "FRBAAAMQ"). That "present
11 value" dollar amount represents the total net fiscal impact (State revenues less State costs)
12 expressed in calendar year 2020 dollars. Calendar year 2020 was selected as it was the
13 date with complete prior year annual average data prior to the on-set of the COVID-19
14 pandemic's impacts on the economy. As such, it used historical data through calendar year
15 2019 as a launching point as it represented the most recent un-distorted launching point for
16 this consensus impact assessment analysis.

17
18 **Q 9. Does this conclude your testimony?**

19 A 9. Yes, it does.