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Highlights

- The Intermountain Power Project is one of the largest coal-fired steam electric power plants in the U.S., employs almost 500 people and generates 13,000 gigawatt-hours of electricity annually.
- The construction of Unit 3 at IPP will provide employment for 2,800 Utah construction workers and generate $230.8 million in compensation. The indirect and induced economic impacts will sustain 7,300 jobs with related earnings of $205.0 million.
- Taxable purchases of materials and equipment used in the construction will total $368.7 million and will generate $21.2 million in sales and use tax revenue. Tax revenue on earnings generated by construction activities will total $47.2 million.
- The operation of Unit 3 will pump $111.0 million annually into the local economy. The new station will require a permanent work force of an additional 75 people with a payroll of $6.4 million. With the indirect and induced effects employment will total 1,862 with earnings of $73.8 million.
- State and local tax revenues generated by Unit 3 operations will total $17.1 million annually. The indirect tax payments derived from earnings are estimated to be $8.0 million annually.
- In 2002, IPP burned more than 5.3 million tons of Utah coal—about one-fifth of all coal produced in the state. IPP coal purchases supported 330 jobs in the coal mining sector. The new operation will require an additional 2.6 million tons of coal each year which will support 165 coal mining-related jobs.

THE ECONOMIC AND FISCAL IMPACTS OF EXPANDING THE INTERMOUNTAIN POWER PROJECT

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This article presents an overview of the Intermountain Power Project and its role in providing power for Utah, California and other western states. It also presents the findings of a study, commissioned by the Intermountain Power Agency, that identifies the economic and fiscal impacts of expanding the existing facility. The full text of the study is available at http://www.business.utah.edu/bebr.

Overview of the Intermountain Power Project

Located in Millard County, Utah the Intermountain Power Project (IPP) is one of the largest coal-fired, steam-electric generating plants in the country. With a gross generating capacity of 1,900-MW, the plant consists of two coal-fired generation units that burn 5.3 million tons of coal annually (about one-fifth of Utah's total coal production) and produce more than 13,000 gigawatt-hours of electricity. IPP employs almost 500 people at the Lynndyl site and has become a significant resource in the region's economic base since it began operating in 1987.

The concept of IPP began in the mid-1970s in response to concerns about future demands for electricity and the capacity of existing resources to meet those demands. To address these issues, 23 Utah municipalities formed the Intermountain Power Agency (IPA) to finance, construct, operate and maintain a power generating facility later named the Intermountain Power Project. Utah public power interests initiated the effort, which was later expanded to include public power interests in California.

Construction of IPP began in October 1981. The initial concept for the $5.4 billion project was to build four 750-MW coal-fired units in Lynndyl, Utah, a site located approximately 100 miles southwest of Salt Lake City. However, by the time the first two units began operating in 1986 and 1987, the project had been

downsized to two 750-MW units leaving room on the site for additional expansion. Since the mid-1980s, the gross capacity of the existing units has been upgraded to 1,900 megawatts.

In addition to the large coal-fired generating units, IPA has also constructed two high voltage transmission systems. These lines, known as the Southern Transmission System (STS) and the Northern Transmission System (NTS) deliver the plant's output to purchasers throughout the state of Utah, into Southern California and portions of Nevada.

The STS is a 488-mile, 500-kV direct transmission line that traverses parts of Utah, Nevada and California and terminates at the AC/DC converter station near Adelanto, California. This line provides power to six municipal power agencies in California.

The NTS consists of two segments. One segment includes two 50-mile, 345-kV AC transmission lines that run from the converter station at IPP to the PacifiCorp Mona Switchyard near Mona, Utah. This segment provides power to members of the Utah Associated Municipal Power Systems (UAMPS) and cooperative purchasers located in Utah. The second segment of the NTS is a 144-mile 230k-V AC transmission line from IPP to the Gonder Switchyard located near Ely, Nevada where it connects with the facilities of Mt. Wheeler Power, Inc. and to the system of the Sierra Pacific Power Company. This line provides power to Nevada and other western states. (Figure 1)

The entire generating capability of IPP is sold to 36 Power Purchasers located in Utah, California and Nevada, pursuant to separate "take or pay" Power Sales Contracts negotiated between IPA and each participant. These Power Sales Contracts expire in 2027. Under the terms of the contracts, each Power Purchaser is entitled to a specific share of the power generated at IPP, and has the option of either using the power or reselling it to another entity. The entitlement shares for each Power Purchaser are outlined Table 1.

Currently, Utah Municipal Purchasers and the Cooperative Purchasers have sold their entitlements (subject to certain permitted recalls) to six California Purchasers, including the Los Angeles Department of Water and Power (the largest municipal utility in the U.S.) and the Cities of Anaheim, Burbank, Glendale, Pasadena, and Riverside. These California Purchasers have committed to take or pay for 96% of the capability of the generating station.

IPP and the U.S. Power Grid System

It is important to note that there is no "national power grid" in the United States; rather, the continental U.S. is divided into three main power grids-the Eastern Interconnect, the Western Interconnect and the Texas Interconnect. On each of these grids, transmission lines run not only from power plants (such as IPP) to load centers, but also from transmission line to transmission line, providing a redundant system that helps assure the smooth flow of power.

The Eastern and Western Interconnects have limited interconnections to each other and the Texas Interconnect is only linked to the others via direct lines. Both the Western and Texas Interconnects are linked with Mexico. The Eastern and Western Interconnects are strongly interconnected with Canada. All electric utilities in the mainland U.S. are connected to at least one other utility via these power grids. The output of IPP ends up on the Western Interconnect.

Proposed Expansion at IPP

The proposed expansion of IPP includes the construction of a third coal-fired generation station (Unit 3). Unit 3 will be essentially a replica of the existing Units 1 and 2 incorporating technological improvements that are available. It will be located on a site adjacent to Unit 2 and will add 950-MW (gross) of generating capability.

The Unit will be designed to burn Utah coal, which will be delivered to the site in railcars owned by Units 1 and 2. Studies completed to date indicate there is sufficient water and coal for Unit 3 to provide an economic life of at least 30 years, as well as operating Units 1 and 2 concurrently.

Measuring the Impacts of the Proposed Expansion

The economic impact estimates presented in this study utilize a standard tool of regional economic analysis known as the Regional Input-Output Modeling System

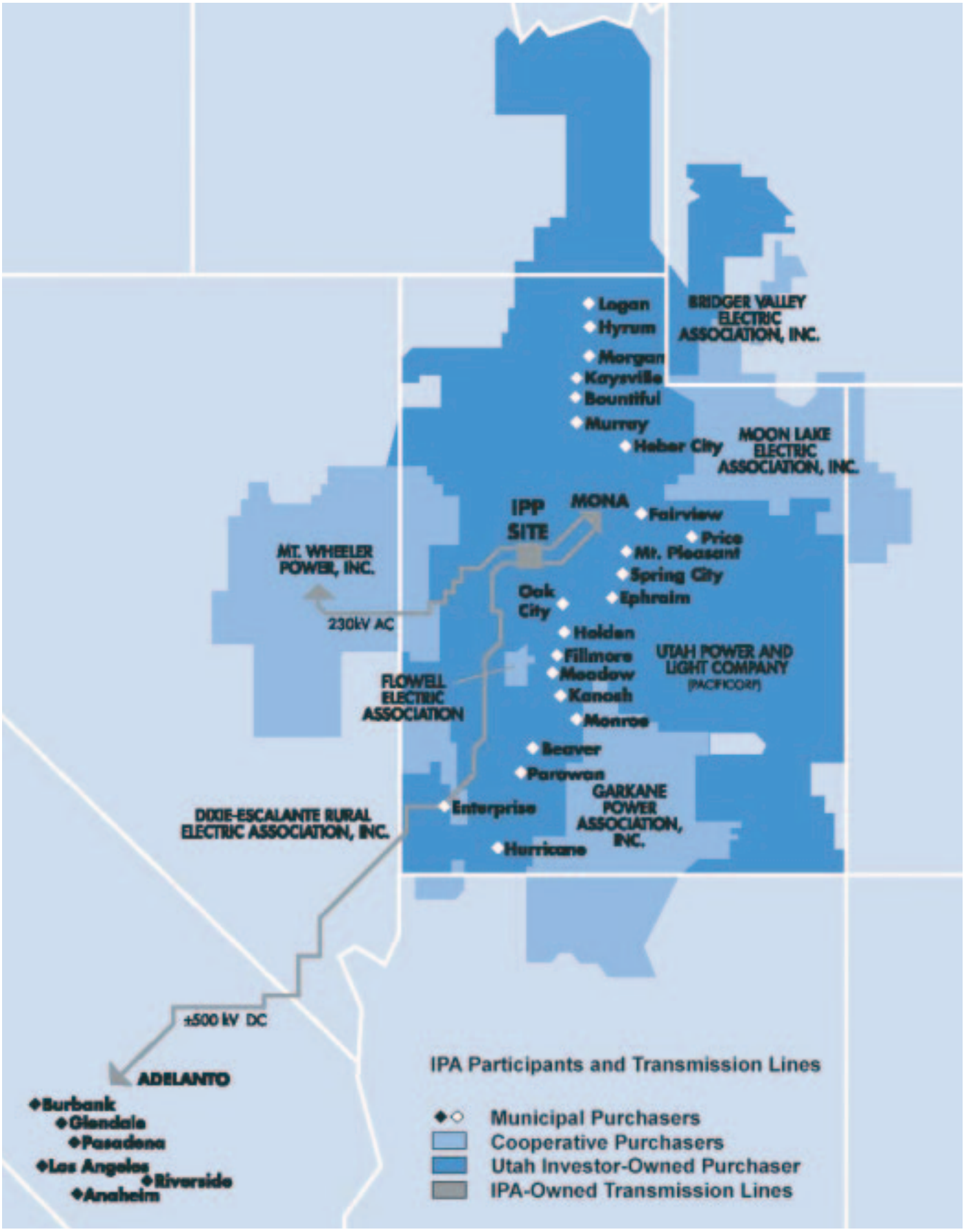
Logan
Hyrum
Morgan
Kaysville
Bountiful
Murray
Heber City
BRIDGER VALLEY ELECTRIC ASSOCIATION, INC.
MOON LAKE ELECTRIC ASSOCIATION, INC.
IPP SITE
MONA
Fairview
Price
Mt. Pleasant
Spring City
Ephraim
Oak City
Holden
Fillmore
Meadow
Kanosh
Monroe
Beaver
Parowan
Enterprise
Hurricane
UTAH POWER AND LIGHT COMPANY (PACIFICORP)
GARKANE POWER ASSOCIATION, INC.
MT. WHEELER POWER, INC.
FLOWELL ELECTRIC ASSOCIATION
DIXIE-ESCALANTE RURAL ELECTRIC ASSOCIATION, INC.
230kV AC
±500 kV DC
ADELANTO
Burbank
Glendale
Pasadena
Los Angeles
Riverside
Anaheim
IPA Participants and Transmission Lines
Municipal Purchasers
Cooperative Purchasers
Utah Investor-Owned Purchaser
IPA-Owned Transmission Lines

Table 1
Generation Entitlement Shares

	Entitlement Share		Entitlement Share
California Purchasers		**Utah Municipal Purchasers**	
Los Angeles Depart. of Water and Power	44.617%	Murray City	4.00%
City of Anaheim	13.225%	Logan City	2.469%
City of Riverside	7.617%	Bountiful City	1.695%
City of Pasadena	4.409%	Kaysville City	0.739%
City of Burbank	3.371%	Heber Power & Light Company	0.627%
City of Glendale	1.704%	Hyrum City	0.551%
Total California Purchasers	**74.943%**	Fillmore City	0.512%
		City of Ephraim	0.503%
Utah Cooperative Purchasers		Lehi City	0.430%
Moon Lake Electric Association, Inc.	2.000%	Beaver City	0.413%
Mt. Wheeler Power, Inc.	1.786%	Parowan City	0.364%
Dixie-Escalante Rural Electric Assn.	1.534%	Price	0.361%
Garkane Power Association, Inc,	1.267%	Mt. Pleasant	0.357%
Bridger Valley Electric Association, Inc.	0.230%	City of Enterprise	0.199%
Flowell Electric Association	0.200%	Morgan City	0.190%
Total Utah Cooperative Purchasers	**7.017%**	City of Hurricane	0.147%
		Monroe City	0.130%
Utah Investor-Owned Purchaser		City of Fairview	0.120%
Utah Power & Light Company (PacifiCorp)	4.000%	Spring City	0.060%
Total Investor-Owned Purchasers	4.000%	Town of Holden	0.048%
		Town of Meadow	0.045%
		Kanosh	0.040%
		Town of Oak City	0.040%
		Total Utah Municipal Purchasers	**14.040%**

Source: Intermountain Power Agency, available at: http://www.ipautah.com/pdf/aboutipa.pdf

(RIMS II). Developed by the Bureau of Economic Analysis (BEA) of the U.S. Department of Commerce, RIMS II is based on an accounting framework called an Input-Output (I-O) table. The RIMS II Model estimates the indirect and induced impacts that result when new activities are introduced into a regional economy, in this case, the impacts on the state of Utah with the flow of dollars to construct and operate a new generation station.

The economic and fiscal impacts of the IPP expansion will occur in two stages. The first stage will be the construction period which is scheduled to occur over a four-year period. The second stage is the operation period. The impacts arising from operations will continue as long as Unit 3 remains in operation

The direct impact of the construction phase includes direct purchases of labor from Utah workers—specifically,

construction craft and support workers located at the construction site. The indirect and induced impacts initiate from purchases made in the local economy for goods and services used in the construction of Unit 3 and occur as Utah suppliers purchase goods and services from yet other Utah suppliers. The induced effects result from the re-spending of wages associated with the direct and indirect employment. As workers re-spend their income on consumer purchases they generate business sales and employment in other sectors of the economy.

The direct impact of the operations phase embodies workers who will be directly employed at Unit 3. The indirect and induced impacts will initiate from purchases made in the local economy to operate the facility, and occur as Utah suppliers purchase goods and services from other Utah suppliers. Again, the induced effects occur when Unit 3 employees and the employees of Utah companies that provide goods and services to operate Unit 3 re-spend their earnings for goods and services from other Utah suppliers.

The fiscal impact estimates presented here reflect the indirect tax revenue generated by earnings attributed to the IPP construction project. To estimate the fiscal revenue from earnings, an effective state and local tax rate was derived by dividing total state and local tax receipts (less corporate income tax) by total state personal income. The base year used in deriving the ratio was 1999-2000 (the most recent year for which data are available). This ratio (10.83%) was applied to the earnings of Utah workers that are attributed to construction activities at IPP. This calculation provides a rough estimate of the relationship between income and tax revenue.

Economic and Fiscal Impacts of the Construction Phase

The estimated cost of constructing Unit 3 is about $1.75 billion, including the direct cost of labor, purchases of equipment, and materials, per diem allowances and equipment leasing. It also includes indirect costs for profit, overhead, payroll taxes, contingency fees, risk insurance and bonding fees. It does not include the cost of interest during construction. The estimated cost for modifications to the Switchyard is $5.3 million. Construction of the project could begin as early as 2004 with an estimated completion date of October 2008.

Using the construction of Units 1 and 2 as a model, and based on discussions with staff from IPA and consultants with the engineering firm Sargent and Lundy (S&L), approximately $427.7 million (about 32% of the total construction cost) will be spent locally. While the difference between total spending and local spending seems significant, about 25% of the total construction cost includes contingency fees and engineering/ procurement/construction (EPC) contract costs that will not involve Utah companies. An estimate of how the money will be spent in Utah is detailed below.

- A large share of the construction will be done by Utah workers. Based on S&L's estimates, the cost of local labor will be $315.3 million and includes: (1) direct compensation of construction craft, (2) direct compensation of construction support service workers, (3) direct compensation of construction craft start-up support, (4) payroll-related taxes paid by the employer for Utah workers, (5) worker's compensation, and (6) fringe benefits and per diems.

- A large share (70%) of the construction materials will be purchased locally. The estimated value of locally purchased construction materials for Unit 3 is $140.2 million. An additional $2.5 million in materials and equipment could be purchased locally for construction activity at the Switchyard.

- The cost of leasing equipment used during the construction phase will be $51.0 million of which 90% will be leased from local vendors. Leased equipment will be used for specific construction tasks and includes such items as bulldozers, cranes, carryalls and trucks. It does not include equipment that will become part of the permanent facility. The estimated cost to lease equipment from local vendors will be $45.9 million.

- The cost for equipment that becomes part of the permanent facility is estimated at $336.7 million. Much (if not most) of this equipment is highly specialized and not manufactured locally. For this reason, very little will be purchased from Utah manufacturers or vendors. BEBR has estimated that the value of locally purchased equipment will be $25.7 million. About $16.8 million worth of equipment will be purchased directly from Utah manufacturers. The remaining $8.9 million will be purchased through distributor representatives.

Impact on Employment and Earnings. The direct impact of the construction phase includes the construction craft and

support service staff employed at the construction site. Using information provided by S&L, BEBR estimates direct, full-time equivalent employment will be 2,793. The earnings of these workers, including wages, salaries and fringe benefits, total $230.8 million.

During the peak of the construction period, average annual employment at the site will exceed 1,000 workers. The average annual estimates for each year of construction are shown below.

	Estimated Direct Employment
Year 1	561
Year 2	561
Year 3	642
Year 4	1,029

The indirect and induced impacts on employment and earnings related to the construction of Unit 3 will be significant. Using RIMS II, the indirect and induced employment stemming from construction totals 7,299 workers. The earnings of these individuals is estimated to be $204.9 million.

Table 2 shows the estimated impact of IPP construction on employment and earnings in the state of Utah that will occur during the construction phase.

Table 2
Impact on Employment and Earnings
Unit 3 - Construction Phase

	Employment	Earnings
Direct Impact (FTE)	2,793	$230,882,373
Indirect and Induced Impacts	7,299	$204,969,314
Total Impact	10,092	$435,851,687

Note: Direct employment estimate is Full-time Equivalent. Indirect employment includes full-time, part-time and proprietor employment.
Source: Calculated by BEBR based on information from Intermountain Power Agency and Sargent and Lundy.

Fiscal Impacts of IPP Construction. In addition to the impacts on employment and earnings, the construction of Unit 3 will generate new tax revenue for state and local government treasuries. The source of this revenue will be purchases of goods and services that are subject to sales and use tax and taxes on the earnings that are generated by construction activities.

As a project entity created under the Interlocal Cooperation Act, all purchases of materials and equipment used in the IPP construction (with the exception of pollution abatement equipment) are subject to sales and use tax. In addition, state and local governments will realize new tax revenue from household earnings attributable to IPP construction activities.

The sales and use tax revenue generated from construction purchases will be derived from taxable purchases of materials and equipment. Based on estimates provided by Sargent and Lundy, material and equipment purchases for Unit 3 and the Switchyard will be about $484.4 million. Of this, $368.7 million will be subject to sales and use tax (pollution abatement equipment totaling $115.6 million is exempt from tax).

Applying a conservative sales and use tax rate of 5.75% to taxable purchases will provide state and local government agencies with $21.2 million in sales and use tax revenue. Of this, approximately $17.5 million will be state tax and $3.7 million will be local option sales and use tax. While it is not possible to specify the amount of sales tax revenue any one county in Utah will receive as a result of the IPP construction, Millard County should collect the largest share of the local option tax provided that the delivery point is specified on the tax return when sales and use tax is remitted to the Utah Tax Commission. If the delivery point is not specified, the local option tax is distributed throughout all counties in the state.[1]

The earnings generated by IPP's construction activities are also subject to a variety of state and local taxes (including personal income, property, sales and other miscellaneous taxes). The tax revenue on total earnings of $435.8 million has been estimated by BEBR to be $47.2 million. When sales and use tax revenue and the tax revenue from earnings are combined, the total benefit to state and local government treasuries is $68.4 million.[2]

Table 3 shows the total economic impact of employment, earnings and tax revenue during the construction phase.

Economic and Fiscal Impacts of Operations

The economic and fiscal impacts of expanding IPP presented here do not represent the full economic impact of operating the IPP facility; rather, they reflect the net economic impact of operating Unit 3 when it becomes operational.

Table 3
Total Economic and Fiscal Impact of Unit 3
Construction Phase

	Direct	Indirect	Total
Employment	2,793	7,299	10,092
Earnings	$230,882,373	$204,969,314	$435,851,687
Total Tax Impacts			$68,405,855
Sales and Use Tax	$21,203,118		
Earnings Derived		$47,202,737	

Source: Calculated by the Bureau of Economic and Business Research.

Currently, IPP employs almost 500 people with a payroll of almost $38.0 million. To operate Unit 3, IPP will employ an additional 75 permanent workers and will spend about $131.0 million annually-$110.0 million will be spent locally. Local purchases include wages and salaries paid to Utah workers and payments for goods and services secured from Utah suppliers. The largest single expenditure will be the purchase of approximately 2.6 million tons of Utah coal at an estimated cost of $72.0 million.

Impact on Employment and Earnings. The direct impact of Unit 3 is measured by the wages, salaries and fringe benefits paid by the company to its employees. The indirect benefits are measured by examining the flows of IPP's direct purchases from Utah suppliers. The induced impacts measure the effects of subsequent spending by IPP employees and the employees of suppliers that provide goods and services to IPP.

When Unit 3 is fully operational, it will employ an additional permanent 75 workers. The wage, salary and fringe benefit payments for these workers will total $6.4 million. The indirect and induced impacts have been estimated using the RIMS II Input-Output Model. As shown in Table 4, the operation of Unit 3 will support 1,862 Utah workers and provide earnings of $73.8 million annually. These impacts will continue as long as Unit 3 remains in operation.

Table 4
Impact on Employment and Earnings
Unit 3 - Operations

	Employment	Earnings
Direct Impact	75	$6,364,425
Indirect and Induced Impacts	1,787	$67,432,649
Total Impact	1,862	$73,797,074

Note: Direct employment estimates include full-time and part-time employment. Indirect employment estimates reflect all full-time, part-time and proprietor employment.
Source: Calculated by BEBR based on information from Intermountain Power Agency and Sargent and Lundy.

For devotees of economic impact analysis, the indirect and induced impacts of operations may seem disproportionate to the direct operations employment estimate. Because the indirect and induced impacts will result from purchases made by IPP, they are derived, primarily, from expenditures for goods and services apart from direct employment and wages. To maintain its operations, IPP will purchase approximately $72.0 million worth of coal annually—the largest single operational purchase of the facility. Based on the employment multiplier for Utah's coal sector (14.55 jobs per million dollar change in final demand) IPP's coal purchases alone will sustain 1,048 jobs annually in the coal industry and other sectors of the Utah economy.

Fiscal Impacts of Operating Unit 3. The fiscal benefits to state and local government treasuries from the operation of Unit 3 include (1) Fee-in-Lieu of property tax payments, (2) Gross receipt tax payments (3) Sales and use tax payments for materials purchased to operate the facility and (4) taxes derived from the direct, indirect and induced earnings generated as a result of IPP operations. When combined, these tax revenues will be significant.

Based on estimates provided by IPA, fee-in-lieu, gross receipts and sales and use taxes related to the operations of Unit 3 will total about $9.2 million annually. State and local governments will also realize an increase in tax revenue in a more indirect way, from earnings generated by the operation of Unit 3.

To estimate the fiscal revenue from earnings, an effective state and local tax rate was derived by dividing total state and local tax receipts (less corporate income tax) by total state personal income. This ratio (10.83%) is applied to the earnings of Utah workers that are attributed to the operations at IPP. Using this methodology, the earnings derived from the operation of Unit 3 will generate about $8.0 million annually in tax revenue for state and local government coffers. The total tax impacts of operations are shown in Table 5.

Impact on Utah's Mining Industry

IPP is a large user of Utah-produced coal and plays an extremely important role in sustaining Utah's coal mining industry. The IPA owns 50% of the Genwal Resources

Crandall Canyon Mine in Emery County and the West Ridge Mine in Carbon County. These two mines, operated by Andalex Resources, supply about 25% of the coal required by IPA. The remaining coal needed by the facility is purchased on the open market.

In 2002, IPP burned more than 5.3 million tons of Utah coal. Virtually all of the coal used in this generation process came from Utah mines and represented about one-fifth of all coal produced in Utah during 2002. The company's coal usage last year sustained 330 jobs in the coal mining sector, or about 23% of all coal mining employment in Utah. The use of an additional 2.6 million tons of coal will sustain about 165 more workers in the coal mining sector.

Table 5
Total Economic and Fiscal Impact of Unit 3 Operations Phase

	Direct	Indirect	Total
Employment	75	1,787	1,862
Earnings $	6,364,425	$67,432,649	$73,797,074
Tax Impact			
Fee-in-Lieu Tax	$6,000,000		
Gross Receipts Tax	$3,050,000		
Sales and Use Tax	$130,000		
Earnings Derived Taxes		$7,992,223	
Total			$17,172,223

Source: Fee-in-Lieu Tax, Gross Receipts Tax, Sales and Use Tax: Intermountain Power Agency; Earnings Derived Taxes: Bureau of Economic and Business Research.

Summary

The Intermountain Power Project is a large and important producer of power in the western United States. It is also a significant economic engine for the state of Utah as its product is sold primarily out of state but its operations draw heavily on Utah labor and production inputs. As this study shows, the impacts of building and operating Unit 3 are considerable. In the short term, construction activities will provide millions of dollars in tax revenue for state and local treasuries and help support the state's construction sector by providing high-paying jobs for several thousand workers. The long-term impacts of operating Unit 3 include increased tax revenue, and expansion in Millard County and the surrounding area by stimulating economic growth in the region. And, in contrast to the construction impacts which occur over a four-year period and cease when the facility becomes fully functioning, the operation impacts will remain stable throughout the life of the facility. Therefore, the operation of Unit 3 will have a significant and lasting impact on the long-term economic viability of the surrounding areas.

Endnotes

[1] Sales and Use Tax: In brief, sales tax is applied to sales and rentals of tangible real property, including most goods and some services. Use tax is levied on out-of-state purchases and rental of tangible property intended for use in Utah. Sales and use tax rates vary somewhat among the different counties in Utah; therefore, the selection of applicable tax rates requires that the point of sale and place of delivery be identified on each contract. For purposes of this analysis, BEBR assumed that the delivery point will be Millard County where the sales and use tax rate is 5.75%.

[2] The indirect fiscal impact estimate assumes that all state and local taxes are tied directly to personal income. This is certainly the case with respect to state income tax, and to a lesser extent sales tax; however, the relationship between income and property tax is less obvious. Receipts from property tax (and possibly other types of taxes) may not be in direct proportion to an increase in earnings. Increases in property tax in particular are tied to other factors - primarily increases in property values. Therefore, these fiscal estimates should be viewed as an "upper bound" estimate of the impact on state and local tax revenues.

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