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The Hub of Human Innovation: Economic Impacts of the UTEP Paso del Norte Clean Energy Incubator Program in El Paso, Texas over October 2014 - December 2015

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**The Hub of Human Innovation:
Economic Impacts of the UTEP Paso del Norte Clean Energy
Incubator Program
in El Paso, Texas
over October 2014 – December 2015**

Technical Report No. 2016-02

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**HUNT INSTITUTE
FOR GLOBAL COMPETITIVENESS**

SUMMARY SHEET

**The Hub of Human Innovation:
Economic Impacts of the UTEP Paso del Norte Clean Energy
Incubator Program
in El Paso, Texas
over October 2014 – December 2015**

(Dollar amounts in 2016\$)

Total Impacts (Operations and Capital Investment)

Business Volume (thousands)	\$ 570.3
Employment	13
Labor Income (thousands)	\$ 441.1

Note: Business Volume and Labor Income impacts should not be added. Labor income is a component of Business Volume.

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Introduction

The Institute for Policy and Economic Development (IPED) and the Hunt Institute for Global Competitiveness at The University of Texas at El Paso were contracted by the Hub of Human Innovation (The Hub) and the Office of Research and Sponsored Projects at The University of Texas at El Paso (UTEP) to conduct an economic impact analysis regarding the UTEP Paso del Norte Clean Energy Incubator program (UPDN CEI). This Clean Energy Incubator program is a partnership between The Hub and UTEP funded through a contract award from the Emerging Clean Technology Program for the Texas Comptroller of Public Accounts, State Energy Conservation Office (SECO) and UT Austin's Austin Technology Incubator (ATI). The UPDN CEI program was developed to facilitate the creation of clean energy companies and help them generate business volume, create jobs and become self-sustained firms.

The Hub was launched in 2011 as a collaborative venture among seven partner organizations in the region. As a technology incubator, The Hub encourages the development of small businesses in El Paso, supporting them during the creation stage. The Hub programs are committed to supporting small businesses in El Paso. They also assist technology-based businesses that seek to expand, relocate or improve their enterprises, providing economic benefits to the region.

Methodology

To estimate the economic impact UPDN CEI program award in El Paso County, a modeling technique known as Input-Output (I-O) analysis is utilized. I-O analysis illustrates how industries and institutions are linked by the intermediate inputs they provide one another to produce the final output in a given economy. For example, in order to produce a good or provide a service, an industry or institution requires materials, products and services from other supplier industries or institutions. Similarly, these supplier industries require materials, products and services to produce the intermediate inputs that will be used for the provision of the final product or service. Essentially, an I-O model captures all rounds of inter-industry/institutional relationships that make up the production processes of industries in a given economy.¹ Therefore, an I-O model can be used to estimate the regional effects of a particular change or shock to that region's economy.

¹ Miernyk, W. H. (1965). *Elements of Input-Output Analysis*. New York: Random House.

Inter-industry/institutional relationships and their overall economic effects on a region are measured using multipliers. Multipliers estimate the total change in an economy resulting from a one unit change in production, employment, income, or some other component of value added. For example, an employment multiplier of 2 suggests that for every one job created by a given industry, an additional job will be generated within the region. It is important to note that different industries or sectors will vary in multiplier size. For instance, industries exhibiting higher levels of interdependence with other industries within a given economy will typically be characterized by larger multipliers. Thus, industries relying less heavily on imports will generally have larger multipliers relative to those requiring commodities and services produced outside the given economy. As a result, larger regions will often have larger multipliers than smaller regions.

There are several I-O commercial software packages available, each of which provides its own unique regionalized multipliers. The model chosen for this study is the IMPLAN or IMPact analysis for PLANing system.² Similar to traditional regional economic modeling techniques, IMPLAN employs a top-down approach, using national data as a control total for state data, and state data, in turn, is used as a control total for county data. In addition to being flexible and relatively easy to modify, IMPLAN explicitly breaks out impacts into three types of effects measured by its multipliers, making this an attractive I-O software package.³ The three types of effects measured by the IMPLAN multipliers used in this report include the **direct**, the **indirect**, and the **induced** effects. IMPLAN is widely accepted and extensively used by numerous public and private organizations to conduct economic impact studies.⁴

The **direct** effect refers to the initial change in demand resulting from new or current expenditures or employment. This effect is the impact that is actually applied to the predictive model for analysis. I-O multipliers are then used to generate changes in other regional economic sectors given the expenditure or employment value of interest. Examples of a direct effect include new operation expenses by a firm in the region or construction expenses in the area.

Indirect effects represent all changes in regional industry activity, such as increase in production and employment that result from the direct effect. For example, increases in the production of communications equipment will result in increased sales of semiconductors, software, and other necessary inputs from

² IMPLAN Group, LLC, IMPLAN System (data and software), 16740 Birkdale Commons Parkway, Suite 206, Huntersville, NC 28078
www.IMPLAN.com

³ Rickman, D. S., & Schwer, K. (Fall 1993). A Systematic Comparison of the REMI and IMPLAN Models: The Case of Southern Nevada. *The Review of Regional Studies*, 148-149.

⁴ Bonn, M. A., & Harrington, J. (2008). A comparison of the three economic impact models for applied hospitality and tourism research. *Tourism Economics*, 14 (4) 769 – 789.

supplier industries within the region. This increased supplier industry activity is captured by the indirect impact.

Finally, the **induced** effect measures the impact of household spending within a region due to changes in labor income or compensation received by workers and business proprietors for both the directly and indirectly impacted regional industries. Continuing with our previous example, increases in the production of communications equipment and supplier industry activities generate increases in worker and proprietor incomes. Households then spend a portion of this income on various goods and services offered within the regional economy, further increasing area sales employment, and income for other local economic sectors. The sum of these three effects represents the total impact of the new or current expenditure/employment value of interest.

IMPLAN provides information and impact results for three key regional economic variables: **output**, **employment**, and **labor income**. Each of these variables is defined below:

1. **Output** - represents the total value of industry production or the value of all goods and services produced within the region's economy. Output is an overall measure of economic activity and is the sum of income paid to all factors of production as well as all inter-industry purchases.
2. **Labor Income** - represents the sum of compensation paid to workers as well as business proprietors. This value includes employer paid benefits and payroll taxes, in addition to wages and salaries. Note that when interpreting the results of this study, labor income and output should not be summed, as labor income is a component of the output value.
3. **Employment** – represents the average annual jobs within a sector and consists of both full-time and part-time positions. This approach is consistent with the international standard for counting the number of jobs in an economic system.

Data

The present study quantified the economic impacts derived from the UPDN CEI program award. The Hub administered the award so that they would be able to support energy efficient small businesses during the period October 2014 – December 2015. The analysis was conducted based on the data provided by The Hub with respect to their operation expenses, as well as the sales, expenses, and capital investments made by the small businesses included in the Hub's information dataset. The IMPLAN model employs this basic information to estimate increases in regional business value (output), employment and labor income. The total impact measures include the so-called direct, indirect, and induced factors; the latter two generally referred to as the multiplier effects. Due to the confidentiality nature of the information provided by the small

businesses supported by The Hub, the company's names are not disclosed. Instead, a code number is assigned to The Hub's clients included in this study. **See Table 1.**

Table 1. Summary Data

Data employed to build the model	Revenue	Payroll	Capital Investment
<i>The Hub of Human Innovation</i>	109,205	185,710	-
<i>Client 7</i>	-	-	52,847
<i>Client 9</i>	20,587	109,840	550,000
<i>Client 25</i>	6,000	11,700	11,200

Source: The Hub of Human Innovation

Notes:

- a) Data for "The Hub of Human Innovation " only include expenses related to the UTEP Paso del Norte Clean Energy Incubator program; RFP No210b.
- b) The analyzed time period includes 15 months (October 2014 - December 2015).
- c) Dollar amounts are reported in 2015 dollars.
- d) Client 2 and Client 5 were excluded of the analysis as they finished their support from "The Hub of Human Innovation" before the UTEP Paso del Norte Clean Energy Incubator program award was emplaced (October 1, 2015).
- e) Client 8 was excluded of the analysis as no information on Operating Costs or Capital Investment was provided.

Economic Impact Findings

Impact of Operations

The economic impact results derived from the operations of the small businesses supported by the UPDN CEI program award as well as The Hub itself are presented in **Table 2**. All dollar impact values are adjusted to 2016 dollars. Impacts represent payroll and sales figures combined for The Hub and its studied clients. Estimations are conducted under the assumption that wages and salaries from all employees, as well as their business operation expenses are fully spent in the County of El Paso, Texas. It was estimated that the operations of the studied small businesses and The Hub contributes to generate more than \$415 thousand in business volume or output during the period October 2014 – December 2015. Of these impacts, it was estimated that \$51 thousand represent increased sales of supplier industries, and \$215 thousand represents increased household spending. In addition, this program produces \$393 thousand in labor income and supports a total of 13 jobs in El Paso.

Table 2. Economic Impacts derived from UPDN CEI program award in El Paso (Operating Cost)

	<i>Output</i>	<i>Employment</i>	<i>Labor Income</i>
Direct Effects	\$147,817	12	\$315,998
Indirect Effects	\$51,691	0	\$16,773
Induced Effects	\$215,659	1	\$61,047
Total Effects	\$415,166	13	\$393,816

Source: Calculated by UTEP Institute for Policy and Economic Development and The Hunt Institute.

Notes: All dollar amounts are reported in 2016 dollars; amounts may not add up due to rounding.

Impact of Capital Investments

The economic impact results derived from capital investments of the small businesses supported by the UPDN CEI program award are presented in **Table 3**. All dollar impact values are adjusted to 2016 dollars. The capital investment direct effect of \$97 thousand (assuming that is all spent locally) is multiplied into a total of \$155 thousand in Output or Business Volume in El Paso County. Impacts derived from subsequent rounds of supplier industries spending are estimated to be \$31 thousand, and almost \$25 thousand of increased household spending. The model does not report any additional jobs expected to be generated from these capital investments. Total labor income is estimated to be \$47 thousand.

Table 3. Economic Impacts derived from UPDN CEI program award in El Paso (Capital Investment)

	<i>Output</i>	<i>Employment</i>	<i>Labor Income</i>
Direct Effects	\$97,762	\$0	\$30,517
Indirect Effects	\$31,471	\$0	\$9,466
Induced Effects	\$25,888	\$0	\$7,329
Total Effects	\$155,121	\$0	\$47,313

Source: Calculated by UTEP Institute for Policy and Economic Development and The Hunt Institute.

Notes: All dollar amounts are reported in 2016 dollars; amounts may not add up due to rounding.

Conclusion

The overall economic benefits derived from the support that the UPDN CEI program award provides to clean energy small businesses and The Hub are substantial to the local economy. Impacts on business volume and labor income resulting from this analysis are approximately \$570 and \$441 thousand, respectively. These impacts provide tangible evidence of the value of UPDN CEI program award to El Paso County, Texas.

Additional impact analysis concerning firms supported by The Hub, but not the UPDN CEI program over the period October 2014 to December 2015, is presented in the attached Appendix.

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Disclosure: The Hunt Institute for Global Competitiveness has assumed the functions and responsibilities of the Institute for Policy and Economic Development (IPED). The latter organization has been disestablished. Please refer all questions to the Hunt Institute.

Appendix. Additional economic impacts.

The Institute for Policy and Economic Development (IPED) and the Hunt Institute for Global Competitiveness at The University of Texas at El Paso have also included in this analysis the local economic impacts of the Clean Energy program supported companies (past and present) as standalone companies, independent of the UPDN CEI program award. Estimations are conducted under the assumption that wages and salaries from all employees, as well as their business operation expenses and capital investment are fully spent in the County of El Paso, Texas. Business Volume (Output) and Labor Income impacts should not be added, as it would be double counting the impacts.

Client 2

This is a small business that was classified as a clean energy company and was supported by The Hub in the past. Although this company “graduated”⁵ from The Hub in March 2013, it continues to operate in the region and generates an economic impact to the community. The Hub reports that Client 2 had six employees with total annual wages of \$279 thousand, and \$2,283 thousand in revenues during 2015. This information was employed to estimate Client 2 economic impacts during 2015 in the County of El Paso (Table A1).

Table A1. Economic impacts of Client 2

	<i>Output</i>	<i>Employment</i>	<i>Labor Income</i>
Direct Effects	\$2,339,901	6	\$285,137
Indirect Effects	\$999,041	8	\$278,991
Induced Effects	\$365,396	3	\$103,445
Total Effects	\$3,704,338	17	\$667,573

Source: Calculated by UTEP Institute for Policy and Economic Development and The Hunt Institute.

Notes: All dollar amounts are reported in 2016 dollars; amounts may not add up due to rounding.

Client 8

This is a small business that was classified as a clean energy company and is currently supported by The Hub. While this company is currently operating in El Paso, the owners and employees are not receiving wages. And, sales revenue and any equipment purchase data were not reported. Given this, no economic impact estimate can be made.

⁵ The Hub refers to a company as “graduated” when it reaches certain level of development that is able to be self-sustained and consequently, their support and assistance from the Hub ends.

Client 5

This is a small business that was classified as a clean energy company and was supported by The Hub in the past. Although this company “graduated” from The Hub in July 2015, it still operates in the region and generates an economic impact to the community. The Hub reports that Client 5 had two employees/owners, and had \$22 thousand in revenues during 2015. This information was used to estimate Client 5 economic impacts during 2015 in the County of El Paso (**Table A2**).

Table A2. Economic impacts of Client 5

	<i>Output</i>	<i>Employment</i>	<i>Labor Income</i>
Direct Effects	\$23,021	2	\$0
Indirect Effects	\$5,760	0	\$1,473
Induced Effects	\$954	0	\$270
Total Effects	\$29,735	2	\$1,743

Source: Calculated by UTEP Institute for Policy and Economic Development and The Hunt Institute.

Notes: All dollar amounts are reported in 2016 dollars; amounts may not add up due to rounding.

Client 7

This is a small business that was classified as a clean energy company and is currently supported by The Hub. As an operating firm, with capital investments and equipment purchases, economic impacts are generated to the community. The Hub reports that Client 7 had three employees/owners, and acquired equipment for \$2,500 during 2015. This information was used to estimate Client 7 economic impacts during 2015 in the County of El Paso (**Table A3**).

Table A3. Economic impacts of Client 7

	<i>Output</i>	<i>Employment</i>	<i>Labor Income</i>
Direct Effects	\$436	3	\$136
Indirect Effects	\$140	0	\$42
Induced Effects	\$115	0	\$33
Total Effects	\$691	3	\$211

Source: Calculated by UTEP Institute for Policy and Economic Development and The Hunt Institute.

Notes: All dollar amounts are reported in 2016 dollars; amounts may not add up due to rounding.

Client 9

This is a small business that was classified as a clean energy company and is currently supported by The Hub. The operation and capital investment of this company generates economic impacts to the community. The Hub reports that Client 9 had four employees with total annual wages of \$102 thousand and \$14 thousand in revenues during 2015. Also, Client 9 acquired \$550 thousand in capital investment and equipment purchases during this same year. This information was used to estimate Client 9 economic impacts during 2015 in the County of El Paso (**Table A4**).

Table A4. Economic impacts of Client 9

	<i>Output</i>	<i>Employment</i>	<i>Labor Income</i>
Direct Effects	\$109,590	4	\$134,266
Indirect Effects	\$34,994	0	\$10,523
Induced Effects	\$93,814	1	\$26,557
Total Effects	\$238,397	5	\$171,346

Source: Calculated by UTEP Institute for Policy and Economic Development and The Hunt Institute.

Notes: All dollar amounts are reported in 2016 dollars; amounts may not add up due to rounding.

Client 25

This is a small business that was classified as a clean energy company and is currently supported by The Hub. The operation and capital investment of this company generates economic impacts to the community. The Hub reports that Client 25 had two employees and one laborer-owner with a total of \$11 thousand annual wages in 2015. Also, Client 25 obtained \$6 thousand in revenues and acquired \$11 thousand in capital investment and equipment purchases during 2015. This information was used to estimate Client 25 economic impacts during 2015 in the County of El Paso (**Table A5**).

Table A5. Economic impacts of Client 25

	<i>Output</i>	<i>Employment</i>	<i>Labor Income</i>
Direct Effects	\$8,109	3	\$12,533
Indirect Effects	\$2,336	0	\$778
Induced Effects	\$8,626	0	\$2,441
Total Effects	\$19,071	3	\$15,752

Source: Calculated by UTEP Institute for Policy and Economic Development and The Hunt Institute.

Notes: All dollar amounts are reported in 2016 dollars; amounts may not add up due to rounding.