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Potential Factors for Metal Heat Treatment in El Paso

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Overview

The Paso del Norte region lacks local access to a small to mid-sized metal heat treating facility. As a result, local industries that manufacture products that require metal heat treatment services typically out-source this service to non-regional companies. Businesses have reported sending materials to California, Arizona, East Texas, and as far out as Illinois.

This report seeks to answer the following questions as it relates to metal heat treatment processing:

1) What is the current demand for these services in the region?
2) What part of that demand is shipped out of town and what is the dollar amount associated with that demand?
3) What size heat treatment facility does current demand for metal heat treatment processing support (quantified in terms of number of employees and average annual wages for employees)? Or alternatively, what are the expected sales of a heat treating facility that starts-up, relocates, or expands into the region?
4) What is the current state and future outlook of local companies that utilize metal heat treatment processing (that is, is their business increasing or decreasing based on analysis of trends in employment, number of establishments, and wages)?

Estimates are made using IMPLAN Impact Modeling and indicate that El Paso can support and is likely to provide growth for a Metal Heat Treating facility. Further assessment of the potential for a facility should be encouraged and may benefit from the growth of the cluster associated with heat treatment and opportunities provided by low interest financing and available skilled labor.

NOTE: This report is not intended to be a business plan or a solicitation for investment funds, but reports best estimates of the demand for heat treatment and potential growth in the Paso del Norte region.

Introduction

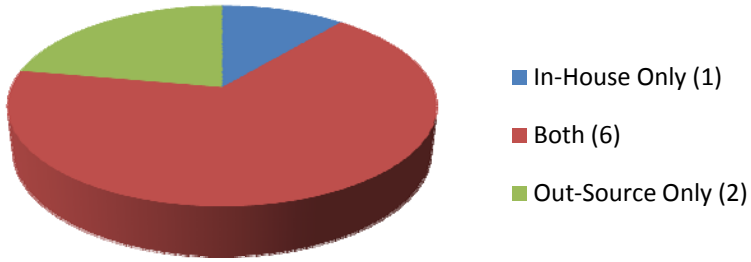
This report provides an assessment of the potential for developing metal heat treating facilities to support the metal fabrication sector in El Paso, Texas. Results include a survey assessing demand by currently operating metal product fabrication enterprises (such as metal stamping) and an analysis of demand for metal heat treating and jobs within the industry in the El Paso area using IMPLAN, an economic impact program maintained at IPED.

Local Business Input

The Institute for Policy and Economic Development (IPED) identified 22 companies that utilize some form of heat treating. Based on phone contacts IPED was able to obtain feedback from nine El Paso manufacturing businesses that use heat treating. These businesses were contacted based on two criteria: 1) whether their North American Industry Classification System (NAICS) description relates to metal product manufacturing; and 2) whether or not the companies “use” commodity 332800 (Coating, Engraving, Heat Treating and Allied Services) to produce goods.

Of the nine businesses, as shown in Figure 1**,** one company processes material in-house only; most likely in a small heat treatment unit. Six companies report that they utilize heat treating services both in-house and out-source. Only two out-sourced all of their heat treating needs. Those companies that out-source partially or wholly are more enthusiastic about development of a metal heat treatment facility in El Paso.

Figure 1
Do you process materials
in-house only, both in-house and out-source, or out-source only?



El Paso Demand for Metal Heat Treating (MHT)

Six businesses provided information on the volume of material processed in-house and out-sourced as shown in **Table 1** below. The data provide a glimpse of the current industry demand and heat treating volume in the region:

- Total weight of out-sourced material (***Out-Sourced Lbs***) ranges from 400 lbs. to 200,000 lbs.
- Quantity of out-sourced parts (***Outsourced Qty***) ranges from 7 thousand units to 35 million units.
- Heat treating costs (***MHT Cost***) incurred range from approximately $250 to $50,000.
- Shipping costs (***Shipping Cost***) range from $500 to $5,000 and as reported are not consistent with volume and weight.
- Three companies (A, D, and F) report ***MHT Costs*** less or equal to $5,000 and two companies (B and C) report ***MHT Costs*** greater or equal to $30,000.
- Of the companies reporting MHT costs, an average exceeding $18,000 per year is incurred when shipping costs are considered.

While this information varies considerably, there is an indication that a demand for heat treating exists and more than $15,000 on average among this small set of businesses is spent annually for metal heat treating outside the El Paso area. Using $15,000 as a conservative estimate of per business demand and knowing that more than twenty firms in the El Paso area utilize heat treatment processes the potential market could exceed $300,000 a year.

Table 1
Amount of Material Heat Treated In-House and Out-Sourced

Company	Total Lbs.	Total Qty.	Out-Sourced Percent	Out-Sourced Lbs.	Out-Sourced Qty.	MHT Cost	Shipping
A	500	-	-	500	-	$250	-
B	200,000	35,000,000	100%	200,000	35,000,000	$50,000	-
C	-	4,000,000	80%	-	3,200,000	$30,000	$500
D	2,000	-	20%	400	-	$5,000	$5,000
E	-	10,000	70%	-	7,000	-	$3,000
F	-	-	20%	-	-	$5,000	-
TOTAL	202,500	39,010,000	-	200,900	38,207,000	$90,850	$8,500

This estimate, in our opinion is relatively low based on discussions with individual managers in companies that require heat treating who indicate that the potential market for a MHT facility in the first year would exceed $500,000. This larger estimate stems from industry knowledge and expertise which also suggests that:

- Many firms do not bid on jobs requiring heat treatment because of the lack of a local facility, a market loss that can easily be captured;
- Metal heat treatment demand also exists in Ciudad Juarez, a demand and labor market not captured by Bureau of Labor Statistics and County Business patterns data, but estimated as large if not larger than El Paso by one industry expert (> $100k per month);
- No active marketing or sales for metal heat treatment occurs due to the lack of a facility;
- El Paso continues to see industrial growth and this sector can experience growth related to a heat treatment facility from
    - New facilities developed within the Paso del Norte
    - Attracting businesses that are in regions that also lack heat treatment facilities
    - Marketing to New Mexico and Mexico where heat treatment options are limited or non-existent.

Estimated MHT Direct Impact and Sales Forecasts for El Paso

IPED employs the IMPLAN [1] software system to estimate direct impacts of regional industries using information, including, but not limited to average wages and total employment. This section describes estimates obtained for both employment and average wages for the metal heat treatment industry in El Paso, if one were to be developed.

[1] The IMPLAN software system helps policy and economic development analysts understand how a local economy functions and understand economic consequences of projects. See: www.implan.com.

IMPLAN Sector 197

In utilizing IMPLAN's direct output per employee, it is important to know that IMPLAN does not provide impacts specifically for the Metal Heat Treating Industry (NAICS code 332811). Instead, industry 332811 is grouped together with 332812 (Metal Coating, Engraving and Allied Services to Manufacturers) and 332813 (Electroplating, Plating, Polishing, Anodizing, and Coloring) into sector 197. The basic concept underlying this grouping in IMPLAN is that each of the sub-industries has the same production functions and thus, has a similar impact on a regional economy. Note that that these three industries are also considered part of the same industry group, 332800 (Coating, Engraving, Heat Treating and Allied Services), in the U.S. 2002 Benchmark IO Make and Use Tables [2]. The following discussion applies to the U.S. 2002 Benchmark IO industry group 332800 or equivalently IMPLAN sector 197.

Employment

Nationally, the average size of an MHT facility in the U.S. in terms of number of employees is 24. However, feedback from local businesses and data from the Quarterly Census of Employment and Wages (QCEW) obtained from the Texas Workforce Commission (TWC) suggest that El Paso industries, by comparison to the country as a whole, only produce enough output to support a smaller facility. In order to estimate the direct impact of a small MHT facility in El Paso, we consider a facility size of less than the 24 employees reported nationally, beginning with two employees in the initial year, with subsequent employment growth driven by sales.

Annual Wages

Three average wage scenarios are considered as estimates for MHT occupations using El Paso and Arizona as a regional comparison and the United States national average as shown below:

Average wages in 2011 dollars

El Paso	$33,314
Arizona	$43,724
U.S.	$49,971

El Paso wages represent a "low" scenario and are based on data obtained from the QCEW-TWC [3] for the years 1990 to 2010. Arizona and U.S. average wages come from the Bureau of Labor Statistics (BLS)

[2] The U.S. Benchmark Input-Output Accounts provide a picture of the inner workings of the U.S. economy by showing relationships between approximately 400 industries and commodities. The following URL provides more information on the benchmarks: http://www.bea.gov/scb/pdf/2007/10%20October/1007_benchmark_io.pdf

[3] The Texas Workforce Commission, Open Records Section, provides quarterly information on establishments, employment, and average wages at the 6 digit NAICS level for Texas counties. A non-disclosure agreement prevents IPED from disclosing information that can potentially reveal information for individual employers.

QCEW [4] and represent the "medium" and "high" scenarios respectively. The rationale for these wage scenarios is threefold:

1) Phoenix Arizona, after New Mexico has the closest heat treatment facilities (New Mexico data was unavailable), and

2) Local businesses frequently report sending materials to Phoenix specifically for heat treating purposes.

3) U.S. average wages represent a "best case" scenario that a heat treatment facility in El Paso provides wages on par with the national average.

Direct Output and Labor Income

IMPLAN uses a linear model to estimate direct output/sales generated per employee. For 2011, output per employee for commodity 332800 [5] in El Paso County is estimated at $146,540 (2011 dollars). Put another way, one employee is expected to generate commodity output of $146,540. This value is the baseline estimate that is used to forecast employment and sales trends for a 15 year period after the initial opening of a local metal heat treatment plant. Labor income, salaries and wages paid out and considered as part of regional income or gross regional product, are also reported and is based on the number of employees multiplied by average wages per employee.

Sales Forecast Methodology

To estimate the output, measured as sales of a MHT facility over a 15 year time period, a sales based linear growth forecast was applied to the IMPLAN output per employee baseline ($146,540). This *sales driven* forecast is based on *Year 1* sales, the baseline year or first year of operation for the model, and subsequent linear growth in annual sales.

Sales Forecast

This section provides an estimate of the direct impact of a MHT facility opening in El Paso based on IMPLAN's output per employee, set at $146,540 (2011$), for industry 332800 (recall the three industries that belong to the industry group 332800 have similar production functions). Tables 2 and 3 show results of the 1, 5, 10 and 15 year sales forecast with a linear increase in annual sales of 7% and 10% respectively. Note that in each case, the *Year 1* Sales/Output starting point is assumed to be $293,000. This is a direct result of applying IMPLAN's output per employee concept ($293,000/2 Employees = $146,540) and employing the assumption that the company starts off with 2 employees.

Table 2 provides insight into development of the Metal Heat Treating industry comparing El Paso to both Arizona and the United States. These data suggest:

[4] The Bureau of Labor Statistics (BLS) publishes quarterly data on establishments, employment and data by county. The BLS however, does not provide 6 digit detail for industries with fewer than 3 establishments.

[5] Each industry in the US benchmark IO can be viewed as both an industry and a commodity. When viewed as a commodity, 332800 represents the product produced by industry with the same name.

1. Sales/Output, at a 7% annual increase, will be just over $538,000 by *Year 10.*
2. Two (2) additional employees are gained across each average wage scenario.
3. Labor income varies across scenarios from $122,493 to $183,739 due to location differences in salaries and wages.

In addition, projecting a 10% annual increase in sales in Table 3 shows:

1. Sales/Output increases to $691,066
2. Three (3) additional employees are gained across each average wage scenario
3. Labor income continues to vary across location scenarios from $157,105 to $235,658

Table 2
Estimated Direct Impact of a Metal Heat Treatment (MHT) Facility
(7% increase in *Sales/Output* per year with a *Year 1* Sales Capture of $293,079)[6]

El Paso Avg. Wages: $33,314	Year 1	Year 5	Year 10	Year 15
Employment	2	3	4	5
Labor Income	$66,628	$87,336	$122,493	$171,803
Sales/Output	$293,079	$384,167	$538,814	$755,715

Arizona Avg. Wages: $43,724	Year 1	Year 5	Year 10	Year 15
Employment	2	3	4	5
Labor Income	$87,448	$114,626	$160,770	$225,488
Sales/Output	$293,079	$384,167	$538,814	$755,715

U.S. Avg. Wages: $49,971	Year 1	Year 5	Year 10	Year 15
Employment	2	3	4	5
Labor Income	$99,942	$131,004	$183,739	$257,704
Sales/Output	$293,079	$384,167	$538,814	$755,715

[6] Note with regards to Tables 2 through 4: the first column (*Year 1*) of each table starts with the same values: two (2) employees, labor income of $66,628, $87,448, $99,942, and $293,079 *Year 1* sales/output.

Table 3
Estimated Direct Impact of a Metal Heat Treatment (MHT) Facility
(10% increase in *Sales/Output* per year with a *Year 1* Sales Capture of $293,079)

El Paso Avg. Wages: $33,314	Year 1	Year 5	Year 10	Year 15
Employment	2	3	5	8
Labor Income	$66,628	$97,550	$157,105	$253,020
Sales/Output	$293,079	$429,097	$691,066	$1,112,968

Arizona Avg. Wages: $43,724	Year 1	Year 5	Year 10	Year 15
Employment	2	3	5	8
Labor Income	$87,448	$128,033	$206,198	$332,084
Sales/Output	$293,079	$429,097	$691,066	$1,112,968

U.S. Avg. Wages: $49,971	Year 1	Year 5	Year 10	Year 15
Employment	2	3	5	8
Labor Income	$99,942	$146,325	$235,658	$379,530
Sales/Output	$293,079	$429,097	$691,066	$1,112,968

Table 4
Estimated Direct Impact of a Metal Heat Treatment (MHT) Facility
(18.26% increase in *Sales/Output* per year with a *Year 1* Sales Capture of $293,079)

El Paso Avg. Wages: $33,314	Year 1	Year 5	Year 10	Year 15
Employment	2	4	9	21
Labor Income	$66,628	$130,319	$301,438	$697,248
Sales/Output	$293,079	$573,240	$1,325,946	$3,067,011

Arizona Avg. Wages: $43,724	Year 1	Year 5	Year 10	Year 15
Employment	2	4	9	21
Labor Income	$87,448	$171,041	$395,631	$915,124
Sales/Output	$293,079	$573,240	$1,325,946	$3,067,011

U.S. Avg. Wages: $49,971	Year 1	Year 5	Year 10	Year 15
Employment	2	4	9	21
Labor Income	$99,942	$195,479	$452,157	$1,045,871
Sales/Output	$293,079	$573,240	$1,325,946	$3,067,011

IPED also applied IMPLAN's direct output per employee to historical data obtained from the QCEW-TWC for industry 332811 [7]. Calculations obtained based on this data point suggest more dramatic growth in annual sales of 18.26%. Using this estimate, Table 4 shows results of the linear sales growth forecast. However, it must be said that these projections are based on historical data and a much more robust economy than currently being experienced nationwide. Yet, El Paso has avoided some of the worst effects of the current economic downturn, thus for comparison purposes these data may be indicative a high growth possibility.

In this case, Table 4 forecasts that by *Year 10*, a heat treating facility is projected to grow to nine (9) employees with output just over $1.325 million and labor income varying from $301,438 to $452,157 across the three wage scenarios.

Projected Metal Heat Treating Demand

This section looks at historical trends at the national and local levels for six (6) El Paso industries that potentially demand/use a large volume of metal heat treating services. The U.S. 2002 Benchmark IO Use Tables specify that the industries shown in Table 5 use commodity 332800 as an input to make goods. In addition, survey results indicate that at least one (1) El Paso business in each industry listed in Table 5 is known to utilize metal heat treating. [8] Thus the six industries can be considered as a group or cluster of industries that use metal heat treating services. Hereafter, these six industries are referred to as the "Metal Heat Treating Demand (MHTD) Cluster".

Table 5
MHTD Cluster

NAICS Code	NAICS Description
332116	Metal Stamping
332510	Hardware Manufacturing
333512	Machine Tool (Metal Cutting Types) Manufacturing
332612	Spring (Light Gauge) Manufacturing
332710	Machine Shops
333618	Other Engine Equipment Manufacturing

Table 6 shows the number of establishments, annual employment, total wages and average wages for the MHTD cluster for the U.S. and El Paso County. All wages are inflation adjusted to 2011 dollars based on the BLS consumer price index (CPI-U).

[7] Due to a nondisclosure agreement IPED has with TWC, IPED is prohibited from disseminating data that breaks the confidentiality of individual employers that file with TWC, such as disclosing exact employees and wages paid by a specific firm that can be used unfairly by competitors.
[8] Businesses were asked to identify their primary industry NAICS code

Note the average wage for the MHTD cluster is $30,786 compared to the El Paso average of $29,192 over 22 years [9] which is a difference of about $1,600. However if we consider the last five years (2006 to 2010), the MHTD cluster and El Paso average wages are $31,812 and $29,828 respectively (a difference of almost $2,000 per year).

Figures 2.a and 2.b, respectively, show the number of establishments in the MHTD cluster at the national and local levels. While U.S. number of establishments has fallen below the national average of 25,552 after 2009, consistent with national manufacturing decline, the number of El Paso establishments has stayed above the El Paso average of 38 since 1997.

Figures 3.a and 3.b show total wages for the MHTD cluster at the national and local levels. While total wages for El Paso have fallen since 2007, from 2009 to 2010 there has been an increase in wages. In addition, the overall trend shows that El Paso wages have remained above the El Paso average of $18.1 million since 2003. By contrast, U.S. wages have fallen below the national average and remained below the average since 2008.

[9] El Paso value based on QCEW-TWC average wages of all industries in El Paso County from 1990 to 2010, whereas MHTD average wages based on industries identified in Table 5.

Table 6
MHT Demand Cluster
U.S. and E.P. Establishments, Employment, and Wages from 1990 to 2010

	Establishments		Employment		Total Wages		Average Wages	
Year	U.S.	E.P. MHTD	U.S.	E.P. MHTD	U.S. (millions)	E.P. (millions)	U.S.	E.P. MHTD
1990	23,463	25	406,499	344	$18,766	$11	$46,164	$32,301
1991	23,685	30	386,591	292	$17,656	$9	$45,670	$30,586
1992	23,764	30	382,168	278	$17,947	$8	$46,962	$28,389
1993	23,845	32	391,022	371	$18,292	$11	$46,779	$28,541
1994	23,968	31	412,293	431	$19,465	$12	$47,212	$28,354
1995	24,831	33	446,805	536	$21,209	$16	$47,469	$29,083
1996	25,540	33	465,558	567	$22,035	$17	$47,330	$29,303
1997	26,343	38	484,696	615	$23,662	$19	$48,818	$30,362
1998	27,227	39	499,195	624	$24,416	$19	$48,910	$31,196
1999	27,311	40	486,158	674	$23,904	$22	$49,169	$32,042
2000	27,209	43	492,738	696	$24,300	$23	$49,317	$32,714
2001	27,021	42	456,719	759	$21,908	$23	$47,967	$30,671
2002	26,697	40	415,569	536	$19,910	$17	$47,910	$32,007
2003	26,233	41	403,363	466	$19,426	$16	$48,160	$34,499
2004	25,838	40	418,920	715	$20,627	$20	$49,239	$27,593
2005	25,692	40	434,851	746	$21,311	$22	$49,009	$29,815
2006	25,611	41	447,431	784	$22,267	$25	$49,766	$31,328
2007	25,885	50	451,165	808	$22,568	$25	$50,021	$31,317
2008	25,894	45	453,702	771	$22,465	$23	$49,516	$30,396
2009	25,544	43	383,640	618	$18,532	$20	$48,304	$32,724
2010	24,999	41	383,078	662	$19,243	$22	$50,232	$33,296
Avg.	**25,552**	**38**	**433,436**	**585**	**$20,948**	**$18**	**$48,282**	**$30,786**

Figure 2.a
U.S. Number of Establishments
MHT Demand Cluster, 1990 to 2010

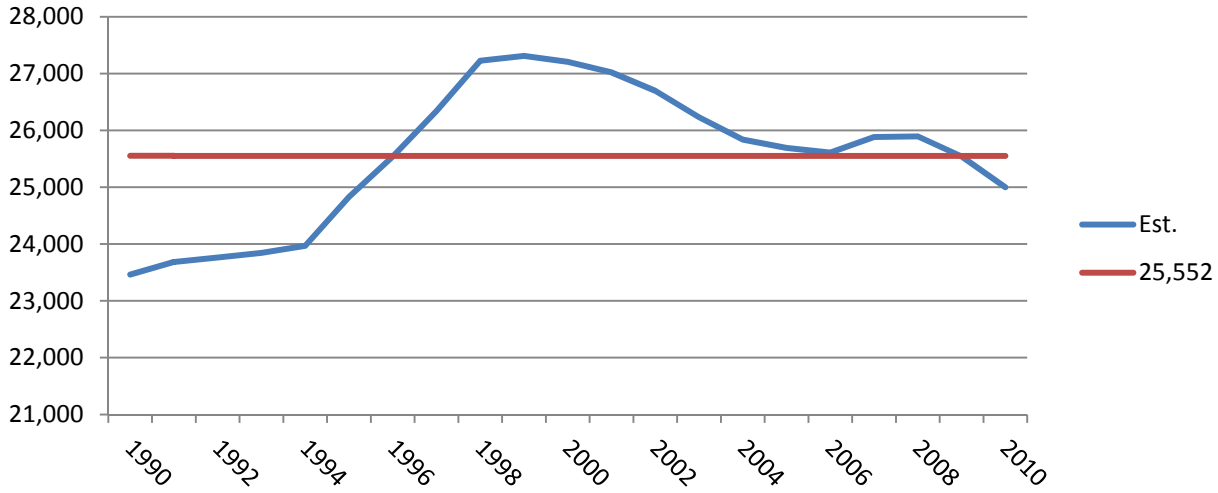


Figure 2.b
El Paso Number of Establishments
MHT Demand Cluster, 1990 to 2010

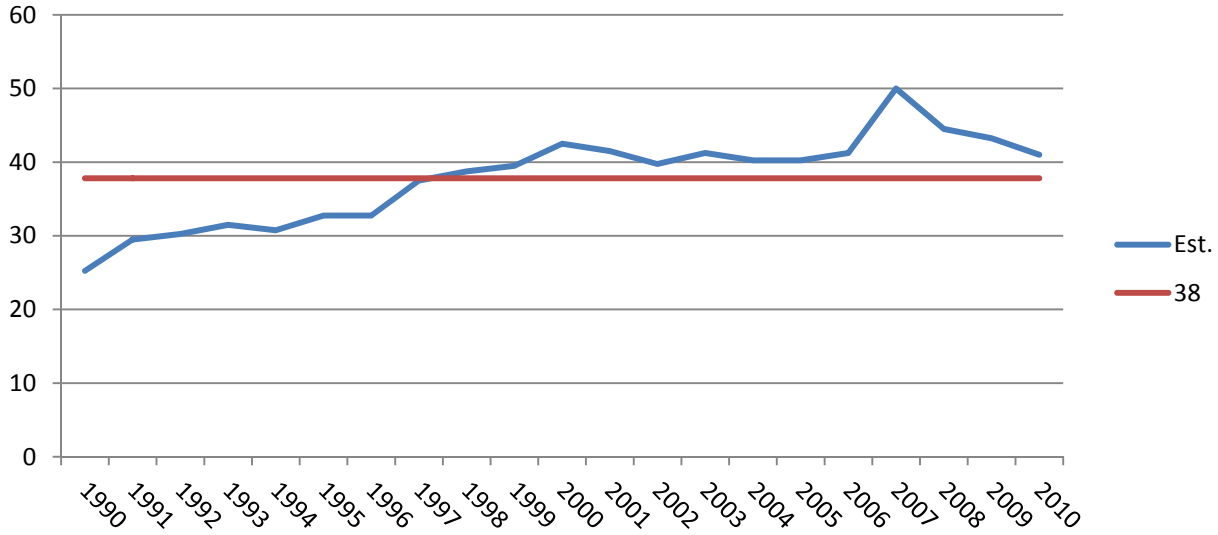
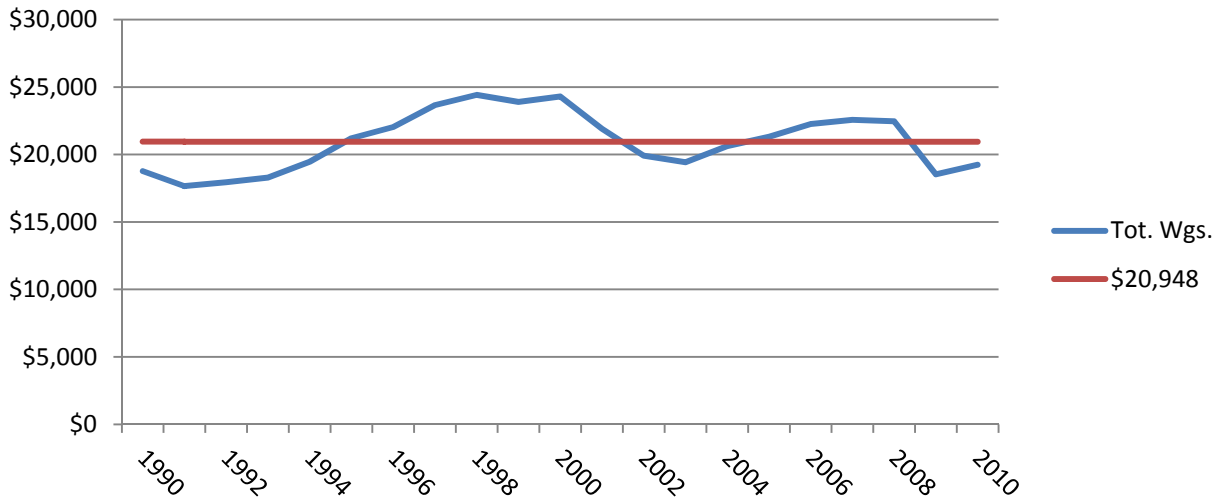
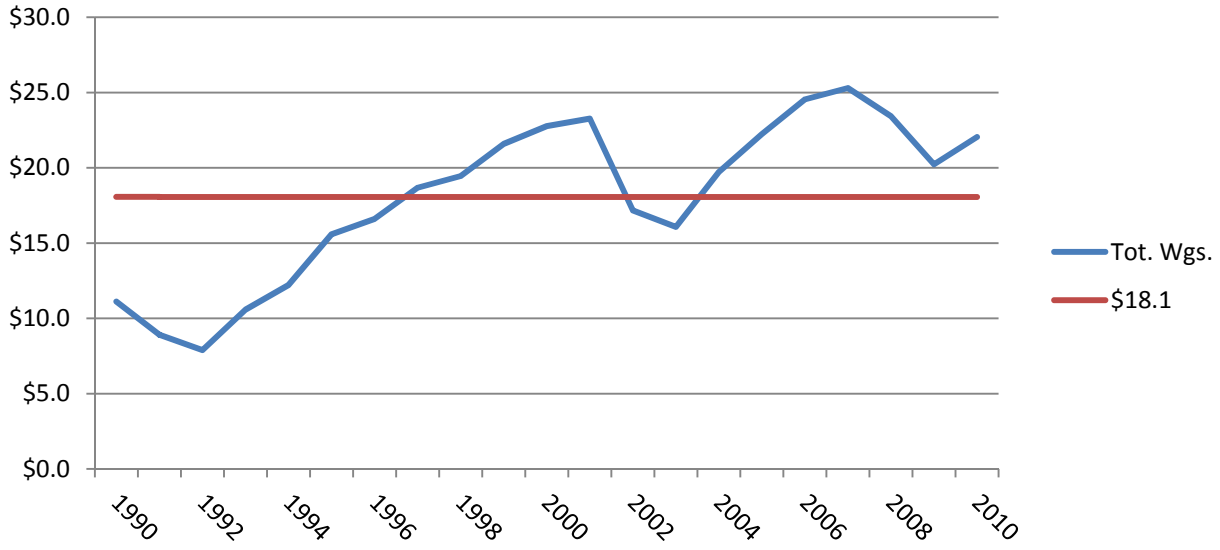


Figure 3.a
U.S. Total Wages (annually in *millions* of US$)
MHTD Cluster, 1990 to 2010



The red line shows the average of Total Wages in ***Millions*** of U.S. Dollars

Figure 3.b
El Paso Total Wages (annually in *millions* of US$)
MHTD Cluster, 1990 to 2010



The red line shows the average of Total Wages in ***Millions*** of U.S. Dollars

Figures 4.a and 4.b show normalized data for both the U.S. and El Paso. These figures plot the factor by which establishments, employment, and wages are increasing or decreasing relative to 1990 values. Figure 4.b shows that the El Paso region has seen an increase in employment and total wages for the MHTD cluster by nearly a factor 2 as of 2010. That is, the MHTD cluster is almost twice the size it was in 1990 in terms of employment and total wages.

Figure 4.a
U.S. Establishments, Employment, and Wages
MHTD Cluster, 1990 to 2010 (*Normalized* to 1990)

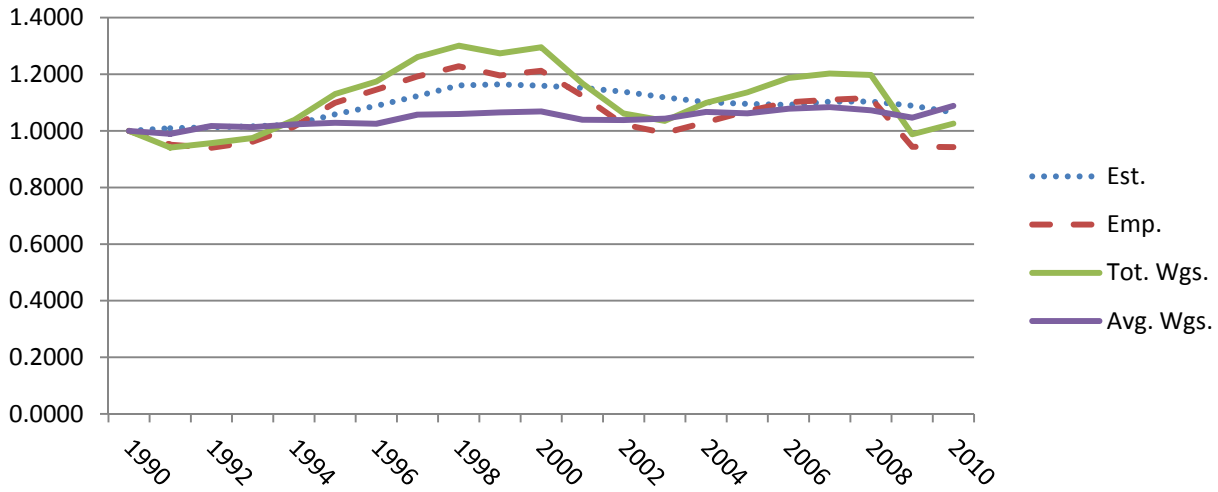
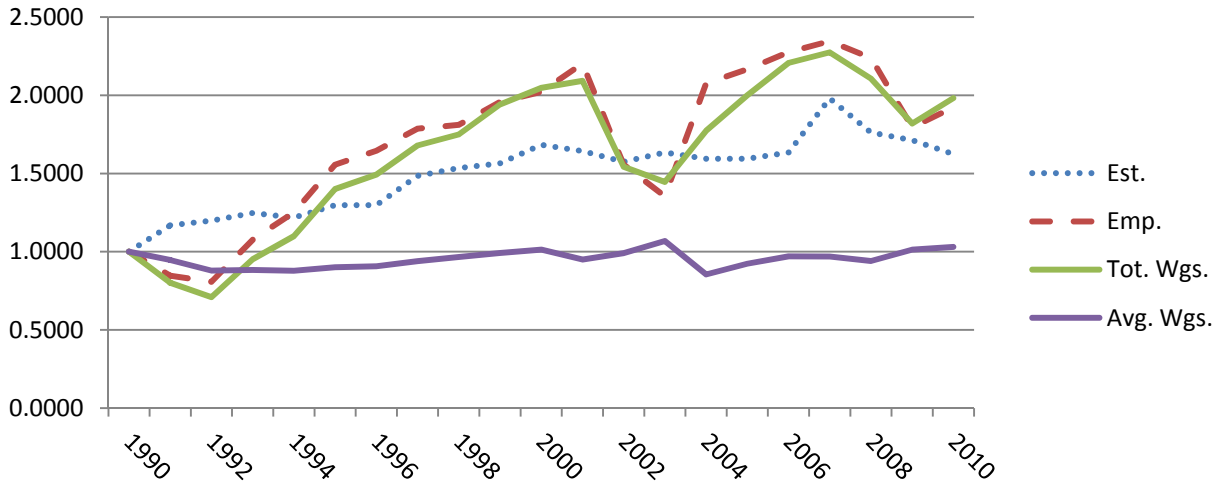


Figure 4.b
El Paso Establishments, Employment, and Wages
MHTD Cluster, 1990 to 2010 (*Normalized* to 1990)



El Paso MHT Investment and Rate of Return

A new MHT facility in El Paso will need to invest in heat treating equipment and suitable facilities. The type of equipment required will depend on the treatment process as well as the type, size, and metallic composition of parts. The following types of parts were identified by local firms as relevant to heat treatment processes (with number of businesses in parenthesis if identified by more than one):

- Screw machine products
- Tool steel for dies
- Die sets (3)
- Punch sets (2)
- Small screw machine parts
- Metal stampings (4)
- Metal stamping punches
- Rollers, links, shafts, beams
- Springs
- Plastic injection cores
- Plates
- Machine parts

In addition, these types of processes were reported:

- Nitriding (2)
- Carburizing (5)
- Austempering (4)
- Annealing (2)
- Through hardening

IPED contacted three heat treating companies [10] and one equipment supplier which are located in either Arizona or Texas. A key member of each company was asked to provide an estimate of the start-up costs associated with a metal heat treatment facility that processed parts via treatment processes as as shown above. Two of the heat treatment contacts placed costs less than or at $1 million (companies A and B) while the third estimated costs at $3.5 million (company C).

The equipment vendor was requested to provide a quote on the equipment needed to meet the needs of a start-up that plans to process 3.5 million parts per year in applications ranging from automotive to radar with processes that include carburizing, annealing, nitriding, austempering, and through hardening. In this case, the estimate for a complete start-up with brand new equipment that can handle all of the processes above ranged from $750,000 to $1,000,000. By considering the highest value provided by the vendor and taking the average of the four estimates (one vendor and three company estimates), the start-up costs of for a heat treatment facility is approximately $1,625,000. If we calculate return on investment based on the high growth scenario depicted in Table 4 (%18.26 percent increase in annual sales), we get results for return on investment as shown in Table 7 below.

[10] A fourth heat treatment company was contacted in New Mexico, however the company deals exclusively with heat treating materials for the petroleum industry.

Note the following about Table 7:

- *Years shown: 1, 5*, *9*, *10*, *14* and *15*
- ROI *Year i* = (Cumulative gain year *i* – initial cost of investment)/initial cost of investment
- Sales/Output is assumed to grow at %18.26 percent annually (See discussion for Table 4)
- Start-up costs are assumed to be $1,625,000 (equipment, truck, etc.)
- Recurring costs are only an estimate and are assumed to be twice the labor income (utilities, transportation, etc.)
- Annual wages are assumed to be constant across years

Assuming new equipment and considering the costs of utilities, transportation, etc., with *Year 1* sales at $293,000, full recovery of start-up costs occurs at *Year 9* based on El Paso average wages. On the other hand, full recovery of start-up costs occurs at *Year 15* for Arizona based wages and the U.S. scenario doesn't see full recovery of startup-up costs until well after *Year 15*. Note: If annual wages are assumed to increase by 3% annually, there is no return on investment over the 15 year period for any of the wage scenarios.

Table 7
Estimated Direct Impact of a Metal Heat Treatment (MHT) Facility with *Return on Investment*
(18.26% increase in *Sales/Output* per year with a *Year 1* Sales Capture of $293,079)

El Paso - Avg. Wages $33314	Year 1	Year 5	Year 9	Year 10	Year 14	Year 15
Employment	2	4	8	9	18	21
Labor Income	$66,628	$130,319	$254,894	$301,438	$589,589	$697,248
Operational Costs	$133,256	$260,638	$509,788	$602,876	$1,179,177	$1,394,495
Sales/Output	$293,079	$573,240	$1,121,213	$1,325,946	$2,593,447	$3,067,011
Gain	$93,195	$182,283	$356,531	$421,633	$824,681	$975,268
Gain (Cumulative)	$93,195	$670,165	$1,798,674	$2,220,307	$4,830,629	$5,805,897
Return on Investment	-0.943	-0.588	0.107	0.366	1.973	2.573

Arizona - Avg. Wages $43724	Year 1	Year 5	Year 9	Year 10	Year 14	Year 15
Employment	2	4	8	9	18	21
Labor Income	$87,448	$171,041	$334,544	$395,631	$773,824	$915,124
Operational Costs	$174,896	$342,083	$669,087	$791,263	$1,547,648	$1,830,249
Sales/Output	$293,079	$573,240	$1,121,213	$1,325,946	$2,593,447	$3,067,011
Gain	$30,735	$60,116	$117,582	$139,052	$271,975	$321,638
Gain (Cumulative)	$30,735	$221,017	$593,192	$732,244	$1,593,113	$1,914,751
Return on Investment	-0.981	-0.864	-0.635	-0.549	-0.020	0.178

U.S. - Avg. Wages $49971	Year 1	Year 5	Year 9	Year 10	Year 14	Year 15
Employment	2	4	8	9	18	21
Labor Income	$99,942	$195,479	$382,341	$452,157	$884,383	$1,045,871
Operational Costs	$199,884	$390,957	$764,682	$904,313	$1,768,766	$2,091,743
Sales/Output	$293,079	$573,240	$1,121,213	$1,325,946	$2,593,447	$3,067,011
Gain	-$6,747	-$13,196	-$25,811	-$30,524	-$59,702	-$70,603
Gain (Cumulative)	-$6,747	-$48,516	-$130,213	-$160,736	-$349,707	-$420,310
Return on Investment	-1.004	-1.030	-1.080	-1.099	-1.215	-1.259

Note: Gain (Cumulative) is the cumulative sum of gain (Sales – Op. Costs – Labor Inc.) from *Year* 1 to *Year i*