

Energy Development and Labor Market Dynamics: A Study of Seven Western Counties

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Impacts of energy development on the secondary business sector of development-impacted counties are examined in a survey of seven western counties. Problems experienced by businesses in attracting and retaining qualified employees and in expanding to take advantage of growing markets are evaluated. Characteristics of private and public sector employees and their implications for community planning are discussed.

The past decade has seen vastly accelerated development of western coal, oil, gas, and uranium reserves to accommodate national energy demands. Exploitation of these resources has resulted in increasing numbers of large-scale projects being sited in sparsely populated areas. Consequently, many small rural communities which previously had a history of stable or declining population and business activity have had to deal with rapidly increasing populations and demands for community services (Murdock and Leistritz, Gilmore and Duff).

The population growth rate at which a town or community becomes "impacted" by development has been estimated to be between 5 and 10 percent annually (Gilmore; FEA). Requirements imposed by the National Environmental Policy Act, state siting acts, and local permitting regulations have mandated that industry maintain detailed records of the size and composition of its work forces (Leistritz and

Chase). The information contained in these reports provides valuable data on workers' origin, marital status, family size, and local residence (for example, ITAT; Schmueser and Associates). However, no attempt has been made to document the size and characteristics of the work force immigrating to fill jobs in support industries in the impacted communities. These businesses, many of which are retail and service oriented, provide a significant source of employment. Leistritz *et al.*, in a study of nine development sites, found that each construction job at an energy facility generated between .2 and .7 additional jobs in the local service sector.

If these secondary jobs are filled by previously unemployed local residents or dependents of immigrating project workers, immigration to the community (and additional demands on housing and services) will be reduced. However, if these jobs are not filled by locals, additional workers and their dependents may move to the area. The source and socioeconomic characteristics (such as previous residence and family size) of primary and secondary migrants is thus of importance to planners and community officials dealing with rapid growth. Findings concerning the experiences of business operators in attracting and retaining qualified employees during area economic expansion will also

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be relevant to business owners and managers in other communities facing energy development.

Objectives

This study is based upon a survey of secondary business and public sector employers and employees in six western U.S. counties affected by energy development. In addition, data from a seventh county which has experienced no energy development were added as a control.

Specific objectives of this paper are to:

1. Identify difficulties experienced by secondary business owners in attracting qualified workers and expanding floor space and inventory to accommodate the community's rapid growth;
2. Identify characteristics of secondary business workers, especially family size, previous residence, and relationship (if any) to workers at the energy facilities; and
3. Discuss implications of these findings and possible planning measures which might apply.

Study Areas

As noted, seven western counties were surveyed. These included three in North Dakota, two in Texas, and one each in Wyoming and Utah.

Mercer County in North Dakota is the site of two major projects currently under construction, the Great Plains Coal Gasification Plant and the Antelope Valley Power Station. A third project, the Coyote Power Station, was completed in 1981. Cities surveyed were Beulah and Hazen.

McLean County, also in North Dakota, is the site of the Coal Creek Power Station. Construction of the project, which began in 1976, was completed in 1980. The survey took place in two of the county's largest towns, Washburn and Underwood.

Growth in Panola County, Texas was largely the result of a lignite fired power plant constructed by Texas Utilities. Construction of the first unit of the three unit plant commenced in 1973; the third and final unit was completed in 1979. The utility continues to employ a large mining work force. The towns with most of the project-related growth, Tatum and Beckville, were surveyed.

The second Texas county, Fayette, was also impacted by construction of a power plant. Construction on the plant began in 1975, with the second unit completed in 1980. Business surveys took place in the town of LaGrange.

In Utah, surveys were conducted in the towns of Huntington and Castle Dale in Emery County. The county had been severely impacted by coal development and the construction of five coal-fired generating units between 1971 and 1983. However, recent years have seen a decline in activity.

Uinta County, in the Overthrust area of Wyoming, is the site of extensive gas and oil development, as well as several gas processing plants. Surveys were taken of businesses in Evanston, the county's principal city.

The final area selected, Hettinger County, North Dakota, was chosen for its recent history of stable population and no major area developments. Surveys were conducted in the principal cities of Mott and New England.

These counties were chosen to provide a cross-section of development scenarios. Two counties (Uinta and Mercer) were surveyed during or near peak development, three counties were post-peak (Fayette, McLean and Panola), and one county was experiencing a major slowdown in development activity (Emery).

The employer survey was conducted on a face to face basis with business owners or managers. The owners were then given blank employee surveys and postage paid return envelopes for distribution to their

TABLE 1. Characteristics of Western Counties and Towns Surveyed.

County/State Towns	1970 Popu- lation	1980 Popu- lation	Percent Change	Development Impact	Peak Work Force (Year)
Hettinger/North Dakota	5,075	4,275	-15.8	(Control)	NA
Mott	1,368	1,315	-3.9		
New England	906	825	-8.9		
McLean/North Dakota	11,251	12,288	+9.2	Power Plant	2,224 (1978)
Underwood	781	1,329	+70.2		
Washburn	804	1,767	+119.8		
Mercer/North Dakota	6,175	9,404	+52.3	Power Plant, Coal	5,000 ^a (1983)
Beulah	1,344	2,908	+116.4	Gasification	
Hazen	1,240	2,378	+91.8		
Fayette/Texas	17,650	18,832	+6.7	Power Plant	867 (1978)
LaGrange	3,092	3,768	+21.9		
Panola/Texas	15,894	20,724	+30.4	Power Plant	1,600 (1979)
Beckville	582	945	+62.4		
Tatum	126	275	+118.3		
Emery/Utah	5,137	11,455	+123.0	Power Plants, Coal Mining	1,605 (1978) ^a
Castle Dale	541	1,905	+252.1		
Huntington	857	2,303	+168.7		
Uinta/Wyoming	7,100	13,021	+83.4	Gas Processing Plants, Oil	7,500 (1982)
Evanston	4,462	6,421	+43.9	& Gas Development	

^a Approximate.

Source: U.S. Department of Commerce, Bureau of the Census; Texas Utilities; Murdock *et al.*; Prall; ITAT; Leistritz and Maki.

workers. In McLean, Mercer, and Hettinger counties, attempts were made to survey the entire secondary business community using information obtained from area chambers of commerce. Of the North Dakota respondents, forty-three percent were retail firms and another one-third were wholesale, finance, insurance, real estate and service firms. Fayette, Panola, Uinta, and Emery county data were obtained from samplings of area businesses drawn from information obtained from area chambers of commerce and census data. Of the respondents from these four counties, two-thirds were retail firms and another one-fourth were wholesale, finance, insurance, real estate and service firms. A profile of area communities and business sectors is provided in Tables 1 and 2.

Comparisons of the total number of establishments and number of establishments surveyed for Hettinger County

(Table 2) suggest some defined inconsistencies between the *Survey of Current Business* (SCB) and the study survey. For instance, fifty retail firms were interviewed, whereas the SCB reports that there were only twenty-eight in Hettinger County. Differences in criteria for reporting chain stores or branch offices as well as procedures for assigning firms to sectors likely account for these apparent discrepancies.

Preliminary Expectations

Analysis of the business survey results focussed on five key areas suggested by previous research (Myhra; Thompson *et al.*; Gilmore *et al.*; Sewel):

1. Changes in wage rates over the survey period
2. Increases in employee turnover
3. Difficulty attracting quality workers

TABLE 2. Profile of Local Business Sectors: Seven Western Counties, 1982.

Counties	Employees	Annual Payroll (\$1,000)	Number of Establishments (Percent of Total)	Establishments Surveyed (Percent of Total)
Emery				
Construction	500-999	D	13 (9.5)	0
Manufacturing	20-99	D	2 (1.5)	0
Transportation	295	6,044	9 (6.6)	1 (6.7)
Wholesale	4	82	5 (3.6)	0
Retail	250-499	D	54 (39.4)	12 (80.0)
FIRE (Finance, Insurance, Real Estate)	45	410	9 (6.6)	1 (6.7)
Services	204	2,114	33 (24.1)	1 (6.7)
Nonclassifiable	18	107	12 (8.8)	0
	1,746	8,757	137 (100.1)	15 (100.1)
Fayette				
Construction	224	2,190	52 (9.7)	1 (2.9)
Manufacturing	591	6,732	24 (4.5)	—
Transportation	167	2,911	24 (4.5)	—
Wholesale	425	4,287	45 (8.4)	—
Retail	1,589	10,162	182 (33.9)	24 (68.6)
FIRE	233	2,418	48 (8.9)	7 (20.0)
Services	708	5,419	117 (21.8)	1 (2.9)
Nonclassifiable	61	586	45 (8.4)	2 (5.7)
	3,998	34,705	537 (100.1)	35 (100.1)
Hettinger				
Construction	58	924	15 (13.2)	7 (6.1)
Manufacturing	35	248	8 (7.0)	2 (1.8)
Transportation	34	585	7 (6.1)	4 (3.5)
Wholesale	100	1,120	19 (16.7)	6 (5.3)
Retail	149	1,104	28 (24.6)	50 (43.9)
FIRE	54	578	10 (8.8)	14 (12.3)
Services	175	1,027	17 (14.9)	16 (14.0)
Nonclassifiable	18	96	10 (8.8)	15 (13.2)
	623	5,682	114 (100.1)	114 (100.1)
McLean				
Construction	20-29	D	23 (8.9)	5 (7.1)
Manufacturing	67	591	7 (2.7)	2 (2.9)
Transportation	81	1,543	12 (4.7)	4 (5.7)
Wholesale	259	2,909	43 (16.8)	8 (11.4)
Retail	429	2,750	85 (33.2)	29 (41.4)
FIRE	99	1,040	17 (6.6)	6 (8.6)
Services	435	3,319	58 (22.7)	8 (11.4)
Nonclassifiable	21	174	11 (4.3)	8 (11.4)
	1,416	12,326	256 (99.9)	70 (99.9)
Mercer				
Construction	153	2,826	24 (14.0)	10 (8.8)
Manufacturing	16	234	3 (1.8)	2 (1.8)
Transportation	364	8,061	10 (5.8)	1 (.9)
Wholesale	152	1,550	17 (9.9)	17 (14.9)
Retail	408	2,752	52 (30.4)	50 (43.9)
FIRE	83	1,264	15 (8.8)	10 (8.8)
Services	399	3,397	38 (22.2)	15 (13.2)

TABLE 2. Continued.

Counties	Employees	Annual Payroll (\$1,000)	Number of Establishments (Percent of Total)	Establishments Surveyed (Percent of Total)
Nonclassifiable	<u>20-29</u>	<u>D</u>	<u>12 (7.0)</u>	<u>9 (7.9)</u>
	1,600	20,084	171 (99.9)	114 (100.2)
Panola				
Construction	586	9,511	44 (13.0)	0
Manufacturing	760	7,468	18 (5.3)	0
Transportation	166	2,650	26 (7.7)	1 (5.3)
Wholesale	130	1,443	32 (9.4)	2 (10.5)
Retail	918	6,316	94 (27.7)	11 (57.9)
FIRE	198	2,583	21 (6.2)	3 (15.8)
Services	413	3,182	73 (21.5)	2 (10.5)
Nonclassifiable	<u>47</u>	<u>539</u>	<u>31 (9.1)</u>	<u>0</u>
	3,218	33,692	339 (99.9)	19 (100.0)
Uinta				
Construction	217	3,254	37 (11.1)	0
Manufacturing	180	2,359	11 (3.3)	0
Transportation	368	6,124	22 (6.6)	2 (20.0)
Wholesale	218	4,908	33 (9.9)	0
Retail	1,247	12,546	89 (26.7)	5 (50.0)
FIRE	172	2,795	19 (5.7)	1 (10.0)
Services	883	10,685	91 (27.3)	1 (10.0)
Nonclassifiable	<u>20-99</u>	<u>D</u>	<u>31 (9.3)</u>	<u>1 (10.0)</u>
	3,310	42,671	333 (99.9)	10 (100.0)

D = Figures undisclosed.

Source: U.S. Department of Commerce, Bureau of Economic Analysis.

4. Expansion of facilities, either inventory or capacity
5. Increases in competition from national/regional chain operations.

Three of these dealt with employee attraction/retention: wage rates, employee turnover, and difficulty attracting new employees. Myhra found that the high wages paid by energy development projects often lead to difficulty in attracting workers to secondary businesses. As a consequence, local businesses may have to increase wages to attract and retain their work force. One study of two energy impacted counties found that, while wage rates in the secondary business sector had increased, these increases were only slightly higher than those found in control counties (Thompson *et al.*). Gilmore *et al.* also found that higher wages at the energy

projects may lead to increased turnover in the secondary work force. In northern Scotland, where development of North Sea oil reserves is creating socioeconomic impacts on small coastal towns, local businesses actually negotiated to limit local hiring by the developer, so as to avoid these problems of attraction, retention, and wage inflation (Sewel).

The two remaining areas of interest examine the overall economic impact on the secondary business sector: amount of expansion of local firms (in inventory or floor space) and advent of outside competition (specifically national or regional chain stores). Increased sales revenues generated by project-induced population are viewed as a major asset of development by local businesses, who frequently attempt to enhance their sales by instituting contracts for local purchasing by the developer

(DePape; Thompson *et al.*; Leistriz *et al.*). However, some observers report a lag in the response of the local business sector to these opportunities due to uncertainty of financing and future demand (Gilmore *et al.*; Denver Research Institute). Finally, the mix of area businesses (i.e., proprietorship, national or regional chain, or franchise) was examined to determine whether chain operations with outside sources of funding had moved into the impact areas to capitalize on increased demands for goods and services. Several previous studies found little evidence of this (Thompson *et al.*; Coon *et al.*) while one recent study of western U.S. oil shale development found that chain operations may put local firms in a disadvantageous position in development areas (Denver Research Institute).

The employee survey analysis focussed on two characteristics: the relationship of secondary workers to workers at the energy facilities, and the percentage of secondary workers who had migrated to the county. Both of these characteristics essentially measure the potential impact of expanded employment in the secondary business sector on area population. It was anticipated that a large labor pool of energy worker spouses was available for employment, since project monitoring reports from large developments have indicated that many relocating workers move to impact areas with their spouses (for example, National Institute for Socio-economic Research; ITAT). Gilmore and Duff found one-fourth of the women they surveyed in Sweetwater County, Wyoming were employed (principally in clerical work), and one-third of the female sample indicated that they had occupational skills which were not being utilized.

Results

The Employer Survey

Businesses surveyed reported only moderate difficulty attracting quality workers

and most did not suffer a high degree of employee turnover. Firms experiencing some increased turnover in the period of energy development ranged from 20 percent of the sample in Uinta County to 42 percent in Mercer County, while 6.3 percent (Panola) to 46.2 percent (Mercer) noted some difficulty attracting quality workers.

High percentages of respondent firms indicated that wages paid employees increased substantially, especially in McLean (66.7), Mercer (64.1), and Emery counties (61.6). Lower percentages of firms in Fayette (39.3), Uinta (40.0), and Panola (35.7) reported substantial wage increases. For those employers reporting substantial wage increases, the average increase over the five-year period in question ranged from \$1.52/hour in Emery County to \$2.44/hour in Fayette County. On a percentage basis, these increases ranged from 39.7 percent (Hettinger) to 93.5 percent (Panola), as compared with an increase in the implicit price index of 48.9 percent over the same period. Hettinger County businesses also reported substantial wage increases (53.2 percent of the sample) over this period. Most businesses had either expanded floor space or inventories to accommodate area growth; only Panola (46.7 percent) had less than half its business sample reporting expansion, while the other counties ranged from 50.8 percent (McLean) and 51.6 percent (Fayette) to 61.5 percent (Emery) and 80.0 percent (Uinta) reporting expanded business capacity over the five year period surveyed.

Mean wages paid by county businesses surveyed ranged from a low of \$4.00/hour in Panola County to \$5.50/hour (Mercer) and \$6.40/hour (McLean).¹ As expected,

¹ It is also noteworthy that the variances in wages paid were not greater (actually, slightly lower) in the impacted counties than in the control county. This might not have been the case had we surveyed basic sector firms (e.g., energy companies) as well as trade and service sector establishments.

TABLE 3. Characteristics of Secondary Businesses, Seven Western Counties, 1983.

	Emery	Fayette	Hettinger	McLean	Mercer	Panola	Uinta
Wages Paid ^a (hourly)	4.42	4.64	5.31	6.40	5.50	4.00	5.60
Average Hourly Wage Increase ^a	1.52	2.44	1.59	1.93	1.85	2.03	2.34
Business Age ^a	11	15	19	18	14	14	19
Number of Employees ^a (Full and Part Time)							
1977	4.2	8.3	3.3	5.2	3.1	4.7	17.6
1978	4.4	8.1	3.0	5.6	4.0	4.9	17.4
1979	4.4	8.3	3.4	6.0	4.8	4.9	15.8
1980	4.6	8.7	3.1	5.3	5.1	5.0	15.9
1981	4.5	10.6	3.0	5.7	5.5	6.0	15.1
1982	4.8	8.4	2.9	5.0	5.6	6.2	15.9
Wage Increase in Past Five Years							
Yes	8 (61.6)	11 (39.3)	41 (53.2)	36 (66.7)	59 (64.1)	5 (35.7)	4 (50)
No	5 (38.4)	17 (60.7)	36 (46.8)	18 (33.3)	33 (35.9)	9 (64.3)	4 (50)
Difficulty Attracting Quality Workers							
Yes	4 (28.6)	12 (38.7)	25 (27.5)	25 (39.7)	49 (46.2)	1 (6.3)	3 (30)
No	10 (71.4)	19 (61.3)	66 (72.5)	38 (60.3)	57 (53.8)	15 (93.7)	7 (70)
Increased Turnover							
Yes	3 (25)	7 (23.3)	14 (15.7)	20 (31.7)	42 (40)	3 (20)	2 (20)
No	9 (75)	23 (76.7)	75 (84.3)	43 (68.3)	63 (60)	12 (80)	8 (80)
Expansion in Past Five Years							
Yes	8 (61.5)	16 (51.6)	42 (35.9)	33 (50.8)	65 (57.5)	7 (46.7)	8 (80)
No	5 (38.5)	15 (48.4)	75 (64.1)	32 (49.2)	48 (42.5)	8 (53.3)	2 (20)
Business Type							
Franchise	1 (6.7)	4 (11.4)	3 (2.5)	6 (8.7)	4 (3.5)	—	—
National Chain	—	5 (14.3)	4 (3.3)	1 (1.4)	5 (4.4)	3 (15.8)	1 (10)
Regional Chain	—	1 (2.9)	2 (1.7)	0	3 (2.6)	3 (15.8)	—
Privately Owned	14 (97.3)	25 (71.4)	111 (92.5)	62 (89.9)	102 (89.5)	13 (68.4)	9 (90)
Sample Size	15	35	120	70	116	19	10

Numbers in parentheses are percent of total.

^a Represents mean values.

^b This figure represents only those businesses which indicated a substantial wage increase.

the number of employees per firm tended to increase as energy work forces increased, notably in Mercer County. More than half of the businesses surveyed (with the exception of those in Uinta County) were established within the past 10 years. Summary of key responses is provided in Table 3.

While some of the results of the business survey coincided with preliminary expectations, several aspects were contrary to those anticipated. One key finding was that the vast majority of business-

es in all counties (ranging from 68.4 to 97.3 percent of the energy counties' totals, with 85.9 percent of the overall sample) were locally owned. In a recent study of rapid-growth oil shale communities, it was found that, in many cases, retail chain operations move in, often bringing existing funding sources with them (Denver Research Institute). This was not the case in this study, however, as only 8.4 percent of the 265 businesses responding in energy counties were regional or national chains. This figure compares with 5 percent of

businesses in Hettinger County being national or regional chains. Of these 22 chain stores in the six counties, only eight were founded after energy development in the county began. It is possible that high sales volume for these newer chain stores may have captured a substantial portion of the expanded area markets; however, no data on sales receipts were available to examine this possibility. Also of note is that 12 of these 22 chain firms were located in Panola and Fayette counties, the two areas with the largest populations.

Other impacts on local businesses often attributed to rapid growth are increased turnover, difficulty attracting workers, and the need for increases in wages paid as many workers are attracted to the high wages paid by the energy facilities (Thomas *et al.*; Murdock and Leistriz). Although many workers in secondary businesses may lack construction skills, there is evidence to suggest that entry level positions do not require extensive prior training or experience (Young and Stevens). Thus, a continuous flow of workers from the secondary sector to the energy facilities could occur as new positions open. However, a comparison of the energy development counties with the control sample indicates that incidence of increased turnover and difficulty attracting workers did not differ significantly in four of the six energy counties.

The two exceptions for the increased turnover issue are Mercer and McLean counties. This may be due to the fact that the Mercer County projects were near the peak of the construction phase when the survey was taken (with a work force of over 5,000 in a county of 9,404 population) so that competition for labor may have been more intense. McLean County construction peaked in 1978, but since McLean and Mercer counties border, it is possible that the Mercer County projects may affect McLean County businesses. As for difficulty attracting workers, significant differences were found by firms in

Mercer and Panola counties. The Mercer County results follow logically from the previous explanation; however, it is difficult to explain why Panola County firms have difficulty attracting workers while Emery, Fayette, McLean, and Uinta do not. Peak construction for the Panola plant was in 1979; the utility continues to employ about 1,900 operational workers and miners. Another possible explanation is that Panola County businesses surveyed paid the lowest hourly wages of the seven counties.

With regard to wage factors, no significant differences were found between business responses in the control and the energy counties in percentage of firms indicating wage increases or amount of wage increase, and only one county differed in wages paid (Panola). (Results of statistical tests are summarized in Table 4.)

The survey results also indicate that energy development (or population growth caused by development) has an expansionary effect on local businesses. More than half of the total sample (excluding Hettinger) had expanded their employment and/or physical facilities in the past five years.

The Employee Survey

As noted, a number of characteristics of secondary business employees were assumed *a priori* such as a high percentage of immigrants and many workers with spouses at the energy projects. However, the survey proved some of these assumptions incorrect.

Between 60 and 72.4 percent of the responding sample were married. Most of the total sample was female (58 percent), employed in retail sales operations. Average number of dependents (spouse and children) ranged from 2.3 in Fayette to 3.3 in Emery. Median for the sample was between one and two.

Perhaps the two most important traits of the secondary work force from a plan-

TABLE 4. Results of t-Tests Between Hettinger County Businesses and Six Energy County Businesses.

County	Increased Turnover	Difficulty Attracting Workers	Wage Increase	Wages Paid	Expansion	Amount of Wage Increase
Emery	-.8 (.425)	-.08 (.933)	-.55 (.584)	-1.57 (.12)	-1.81 (.07)*	-.07 (.947)
Fayette	-.94 (.349)	-1.17 (.243)	1.26 (.209)	-1.6 (.113)	-1.6 (.113)	1.35 (.186)
McLean	2.42 (.017)**	1.46 (.145)	1.54 (.126)	-.40 (.69)	1.96 (.051)*	-1.25 (.215)
Mercer	3.84 (.001)***	2.75 (.007)***	1.43 (.15)	-.57 (.574)	3.35 (.001)***	1.39 (.167)
Panola	.41 (.683)	-1.84 (.069)*	-1.2 (.232)	2.36 (.02)**	.81 (.42)	-.62 (.538)
Uinta	.344 (.731)	.168 (.867)	-.17 (.863)	-.37 (.709)	2.8 (.006)***	-.95 (.349)

* Significant at 90 percent confidence level.

** Significant at 95 percent confidence level.

*** Significant at 99 percent confidence level.

Note: Numbers in parentheses are the probability of a greater absolute t value.

ner's perspective are the number of immigrating workers and the number of workers with a relative employed at an energy facility. These two factors will influence an area's population growth. A substantial number of employees listed a previous residence outside of the survey county, ranging from 90 percent (Uinta) and 89 percent (Mercer) to 62.9 percent (Emery) and 61 percent (Fayette). Average years of residence varied from a low of 6.3 in Uinta to a high of 18.5 in Fayette.

As previously stated, it was conjectured that the large number of spouses of workers at the energy facilities might fill many of the secondary business jobs. However, employees with spouses at the energy projects ranged from 11.5 percent in Fayette to 20.4 percent (McLean), 22.2 percent (Mercer), and 26.3 percent (Panola). Emery (42.9 percent) and Uinta (47.8 percent) did have substantial percentages of the survey population with energy-employed spouses; however, these two counties accounted for only 9.2 percent of the total sample. Overall, 22.5 percent of the

six county sample had spouses working at an energy facility.

Given this statistic, the large number of secondary workers that had immigrated from outside the county becomes especially important. Of these, many had previously resided out of state. Locals (non-migrants) accounted for between 10 percent (Uinta) to 39 percent (Fayette) of responding population. An interesting fact is that the two counties with the lowest percentage of out of state immigrants, Panola (7.4) and Fayette (9.1), were also the two most populous counties of the sample, in the state with the largest population (Texas) of the four surveyed. Immigrants accounted for 76.8 percent of the six county sample, with 25 percent of total immigrating from out of state. In spite of the large numbers of immigrants, most indicated that they intend to stay in the area permanently, ranging from 70.4 percent in Emery to 91.5 percent in Fayette, and 81.5 percent of total (Mercer County residents were not asked this question).

From a planning standpoint, this seems to suggest that in addition to locals and

TABLE 5. Characteristics of Secondary Business Workers, Seven Western Counties, 1983.

	Emery	Fayette	Hettinger	McLean	Mercer	Panola	Uinta
Number of Dependents per Married Worker ^a	3.3	2.3	2.7	2.6	2.6	2.4	2.3
Marital Status							
Married	21 (72.4)	78 (70.3)	115 (72.3)	93 (64.4)	189 (60.0)	21 (63.6)	22 (68.7)
Single	8 (27.6)	33 (29.7)	44 (27.7)	44 (33.6)	126 (40.0)	12 (36.4)	10 (31.3)
Spouse Occupation							
Energy	9 (42.9)	9 (11.5)	4 (3.5)	19 (20.4)	42 (22.2)	5 (26.3)	11 (47.8)
Nonenergy	12 (57.1)	69 (88.5)	111 (96.5)	74 (79.6)	147 (77.8)	14 (73.7)	12 (52.2)
Previous Residence							
County ^a	10 (37.1)	30 (39)	32 (26.7)	21 (17.2)	56 (21.0)	7 (25.9)	3 (10)
State	9 (33.3)	40 (51.9)	65 (54.2)	77 (63.1)	135 (50.8)	18 (66.7)	6 (20)
Out of State	8 (29.6)	7 (9.1)	23 (19.1)	24 (19.7)	75 (28.2)	2 (7.4)	21 (70)
Years of Local Residence ^b	12.6	18.5	18.1	13.3	9.8	9.8	6.3
Gender							
Male	6 (20.7)	43 (40.6)	72 (45.6)	64 (46.0)	155 (50.2)	0	6 (18.7)
Female	23 (79.3)	63 (59.4)	86 (54.4)	75 (54.0)	154 (49.8)	31 (100.0)	26 (81.3)
Age ^a	36.8	34.2	37.1	32.3	31.7	28.3	32.1
Wage Received ^a	4.55	5.58	5.74	4.84	5.89	3.93	5.74
Expected Length of Stay							
Less than 3 months	0	2 (1.9)	1 (0.7)	2 (1.6)	c	—	—
3-11 months	0	0	4 (2.6)	4 (3.1)		2 (7.4)	—
1-2 years	4 (14.8)	3 (2.8)	10 (6.6)	7 (5.5)		1 (3.7)	3 (11.1)
3-5 years	4 (14.8)	4 (3.8)	6 (4.0)	17 (13.4)		2 (7.4)	3 (11.1)
Permanently	19 (70.4)	97 (91.5)	130 (86.1)	97 (76.4)		22 (81.5)	21 (77.8)
Sample Size	29	111	159	140	315	33	32
Response Rates (percent)	100.0	40.5	61.6	52.0	55.5	28.7	88.9

Numbers in parentheses are percent of total.

^a This term represents those employees who moved to the survey town from other parts of the county.

^b Represents mean values.

^c This question was not asked of Mercer County respondents.

immigrating energy work forces and dependents, there is a third group to be considered: immigrating secondary workers and their families. Survey respondents averaged from 2.3 (Fayette and Uinta) to 2.6 (McLean) and 3.3 (Emery) dependents per family; combined with the fact that 64.2 percent of the sample was married, this group can have a substantial impact on area population growth and, consequently, demand for housing and public services. Results of the employee survey are summarized in Table 5.

Analysis by Length of Residence

Average years of residence in the six energy counties ranged from 6.3 in Uinta

to 18.5 in Fayette. However, median years of residence for respondents in these counties was less than the number of years elapsed since the energy project began; in other words, more than half of the respondents had moved to the area since the energy development started construction. The one exception to this was Fayette County, which had a median residence value of 17 years. This may be because Fayette's project work force size (867) was small relative to the county population (17,650 in 1970), so that area growth was not as dramatic as in the other study areas.

Given this trend, it was decided to create a subgroup of newcomers who had arrived in the area since the project(s) began (Table 6). If this group differed sub-

TABLE 6. Characteristics of Recently Immigrating Secondary Business Workers, Six Western Counties, 1983.

	Emery	Fayette	McLean	Mercer	Panola	Uinta
Number of Dependents per Married Worker ^a	3.5	2.3	2.7	2.6	2.3	1.9
Marital Status						
Married	12 (80.0)	32 (68.1)	54 (74.0)	120 (63.1)	17 (77.3)	17 (70.8)
Single	3 (20.0)	15 (31.9)	19 (26.0)	70 (36.9)	5 (22.7)	7 (29.2)
Spouse Occupation						
Energy	7 (63.6)	7 (21.9)	12 (22.8)	26 (21.7)	4 (26.7)	11 (68.8)
Nonenergy	4 (36.4)	25 (78.1)	42 (77.8)	94 (78.3)	11 (73.3)	5 (31.2)
Previous Residence						
County	7 (46.7)	12 (26.7)	8 (11.3)	29 (15.6)	5 (23.8)	2 (8.3)
State	3 (20.0)	27 (60.0)	48 (67.6)	99 (53.2)	4 (66.7)	4 (16.7)
Out of State	5 (33.3)	6 (13.3)	15 (21.1)	58 (31.2)	2 (9.5)	18 (75.0)
Years of Local Residence ^a	3.6	3.8	3.7	2.9	4.5	1.8
Gender						
Male	3 (25.0)	16 (35.6)	31 (42.5)	98 (52.4)	0	5 (20.8)
Female	12 (75.0)	29 (64.4)	42 (57.5)	89 (47.6)	21 (100.0)	19 (79.2)
Age ^a	31.4	26.5	28.1	30.0	30.1	30.0
Wage Received ^a	4.19	5.14	4.69	5.92	4.00	5.70
Expected Length of Stay						
Less than 3 months	—	2 (4.4)	2 (2.9)	b	—	—
3–11 months	—	1 (2.2)	2 (2.9)		—	—
1–2 years	3 (21.4)	2 (4.4)	4 (5.9)		1 (5.5)	3 (15.0)
3–5 years	3 (21.4)	3 (6.7)	11 (16.2)		1 (5.5)	3 (15.0)
Permanently	8 (57.2)	37 (82.2)	49 (72.1)		16 (88.9)	14 (70.0)
Sample Size	15	47	73	190	22	24

Numbers in parentheses are percent of total.

^a Represents mean values.

^b This question was not asked of Mercer County respondents.

stantially from the overall sample, differences in services demanded by newcomers might be expected (Lovejoy *et al.*). As might be expected, a higher percentage of this subgroup had a spouse employed at an energy facility (27 percent) than the total sample (22.5 percent). With the exception of Panola, the population average age for the subset is less than for the total. Very little variation in family size (number of dependents) is noted.

Wages received by these recent immigrants are marginally lower than in the total sample, possibly owing to fewer years on the job for newcomers. Finally, although a majority of the subset intends to stay in the area permanently, larger per-

centages envision their residency as temporary than do the total sample.

Breakdowns of sex by occupation also revealed that 86.9 percent of the female sample was concentrated in the two lowest paying occupational categories, sales and service, compared to 30.2 percent of males. In contrast, 55 percent of males are employed in the two highest paying occupations, craft and professional, compared to 11.4 percent of females surveyed.

Conclusions

It appears from the four state surveys undertaken that immigrating secondary

workers and their dependents constitute a substantial source of impact on an energy community. Further data indicate that many of these employees intend to stay in the area permanently. Substantial yet smaller than expected percentages of energy workers' dependents are actively involved in the secondary labor force.

Businesses in the study areas had expanded to meet growing community demands. Many businesses had been established since the onset of the energy projects. Turnover and difficulty attracting workers were not viewed as a problem by more than half of the respondents, while most indicated that their wage levels had increased substantially.

Employees immigrating to the area since energy development began were slightly younger than longtime residents, although family sizes were comparable. A larger percentage of these employees had a spouse employed at one of the county's energy facilities. Finally, most of these newcomers intend to stay in the county permanently, although a larger percentage of this group views its stay as temporary.

It is possible that communities may want to take steps prior to project development to lessen secondary worker immigration, just as many mitigation plans try to reduce project work force immigration (Leistriz *et al.*; Halstead *et al.*). Active recruitment of unemployed local and energy related spouses and dependents by local businesses can decrease the need for additional outside workers to fill secondary jobs. Ensuring that adequate, reasonably priced day care facilities are available for parents wishing to join the labor force may also prove useful.

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