## THE HOMEGROWN ECONOMY

A prescription for Saint Paul's future







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This publication was developed, researched, and written by David Morris and the Institute for Local Self-Reliance with the assistance of the residents and employees of the City of Saint Paul, and especially the Homegrown Economy Project staff, Department of Planning and Economic Development. Overall design and graphics were done by the St. Paul Department of Planning and Economic Development. The preparation and presentation were made possible by grants from the Northwest Area Foundation, and from the Dayton Hudson Foundation through the contributions of B. Dalton Bookseller, Dayton's, and Target Stores.

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## THE REAL VOYAGE OF DISCOVERY CONSISTS NOT IN SEEKING NEW LANDS BUT IN SEEING WITH NEW EYES.

Marcel Proust

Mayor George Latimer in a letter to city employees, November 1983

he Homegrown Economy's message is simple. If we can do it ourselves we probably should. Self-reliance is a cherished Minnesota trait and an American tradition. It is now the foundation for a dynamic approach to a healthy local economy.

Self-reliance need not mean self-sufficiency or isolationism. Interdependence is a fact of modern life. The Minnesota World Trade Center is as much a symbol of the Homegrown Economy as is the Saint Anthony Park Block Nurse Program or the District Heating Development Corporation. A self-reliant city is self-aware, self-conscious, self-confident. Wherever possible it creates wealth from within.

Creating wealth from within has recently become more attractive because of changes in the price of basic resources. After a century of falling prices, fuel hikes in the past 10 years have made many of our inefficient physical systems a burden on the local economy.

Recently we also have discovered how expensive it is to throw something "away." Conceivably the cost of disposing of products may soon be equal to the cost of producing them. Nearby landfills are filling up. In 1970 an annual ton of garbage generated by a Saint Paul household could be dumped in a nearby landfill for a few dollars. Today the cost of disposal is approaching \$15 and may reach as much as \$50 per ton. Moreover the cost of making new landfills safe and cleaning up the damage caused by pollution is dramatically raising the cost of disposal.

In 1970 chemical wastes were dumped on the side of the road or down sewers. Today chemical waste disposal has become so expensive and so fraught with potential future liability that to many firms the cost of disposal has literally gone from zero to infinity in just over a decade. One of the first to feel these changes has been the electronics industry, a mainstay of the Twin Cities economy.

Pollution is a resource that hasn't yet been harvested.

**Buckminster Fuller** 

What effects have these two profound historical changes—the rise in cost of fuel and the cost of disposal—brought?

Higher transportation costs increased the cost of bringing a pound of vegetables from California to Saint Paul from a penny to a nickel and this in turn has revived local vegetable production.

Higher energy costs encourage the banker to include the costs of heating your home when evaluating your ability to carry the mortgage. Put simply, today's sophisticated banker will give the buyer of an efficient house a bigger mortgage than the buyer of an inefficient house when both have the same income.

Higher energy and disposal costs encourage recycling. Resource recovery captures the embodied energy in the material and avoids its disposal cost. In the Homegrown Economy the level of disposal is a measure of its inefficiency (i.e. its loss of potential wealth).

The goal of the Homegrown Economy is to extract the maximum amount of useful work from each local resource. Efficiency is its driving force. Accomplishing this goal requires us to tap an abundant Saint Paul resource—human ingenuity.

Once, when Thomas Edison and Henry Ford met at the great inventor's house, Ford found the front gate difficult to push. He wondered how the mechanical genius and perfectionist Edison could permit such a faulty mechanism in his own front yard. When asked Edison told the father of the American transportation system that the front gate was attached to a pump and that when the gate swung it provided the mechanical energy to pump some water into his house water tank.

All of Edison's neighbors probably had front gates. Theirs' might have been somewhat easier to push but their visitors did no useful work when they came and went.

Human ingenuity is found in many places and in many guises. One cannot command invention but a community can create the environment that allows it to fluorish.

Rules of Thumb "A good rule of thumb will turn information that you have into information that you need," says Tom Parker, who collected almost 900 of these gems of folk wisdom in his book Rules of Thumb. Sprinkled throughout this brochure are some examples. How many rules of thumb can the people of Saint Paul gather?

Invention can occur in the home or the factory. It can come from an individual or a corporation. Most inventions enhance productivity incrementally. They allow us to do the same useful work more efficiently or to extract useful work from an otherwise wasted resource.

Ingenuity, initiative and enterprise imply risk, and risk implies the possibility of failure. A healthy economy is a boiling cauldron of life and death, of experimentation and failure and success. Progress consists of thousands of small advances usually built on the learning experience of tens of thousands of small failures. To try is to !earn.

#### **Knowing Home**

Nowing home means knowing the way resources flow through our community. Information is Power. People need information in a form they can understand. Sometimes graphs can tell us something that a stream of numbers cannot. What follows is some selected information about Saint Paul.

#### WHERE DOES OUR MONEY COME FROM?



Wages & Salaries: 66¢

Dividends, Interest & Rent: 20¢

Transfer Payments: 14¢

Most of us get our money from labor. But a significant amount comes from investments and social security and welfare.

Source: Major Sources of Personal Income, Bureau of Economic Analysis, April 1984 — Minnesota and Ramsey County

#### Making the Most Out of What We Have

We are all consumers and we should all be producers.

Ralph Waldo Emerson

An efficient community makes the most from what it has. How can we decide where our efforts will have the greatest payoff? One way is to track the flow of resources through our borders and to focus on those strategies that can keep as many dollars in the local economy as possible. Recycling dollars is as important as recycling materials in the self-reliant city.

The way we spend our money and what we spend our money on greatly influence the local economy. For example, Saint Paul households spend about the same for three items: meat, electricity and property taxes. Yet the local impact of a dollar spent for each is quite different. Most of our property taxes stay in the local economy to pay teachers and staff. About 40 cents of the dollar spent on meat stays in the local economy. Less than half that proportion stays in the local economy when we buy electricity or other fuels. Only about 20 cents of the energy dollar remains to pay for

local goods and services, local labor, local taxes or dividends.

Electricity, like gasoline and natural gas and fuel oil, is vital to our standard of living and the health of our economy. But savings achieved through energy conservation have a much greater beneficial impact on the local economy than savings, for instance, from a reduction in the number of teachers in the school system.

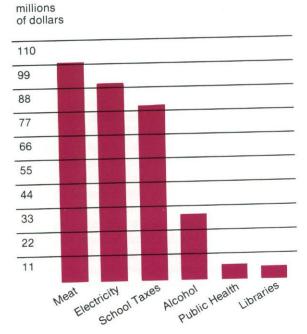
To take the energy example a step further, Saint Paul's households and businesses and government spend about \$450 million on energy each year. Some \$350 million leaves the local economy.

How might we reduce this outflow? One way is to improve the efficiency with which we use energy. Raise the efficiency of our furnaces or our lights or appliances or cars, tighten up the leaks in the walls and ceilings of our buildings, and we will use less energy to perform the same amount of useful work.

Rules of Thumb A change of \$1 per barrel in the price of crude oil means a change of 2.5 cents per gallon in the price of gasoline.

#### **Knowing Home**

#### WHERE DO WE SPEND OUR MONEY? SELECTED ITEMS

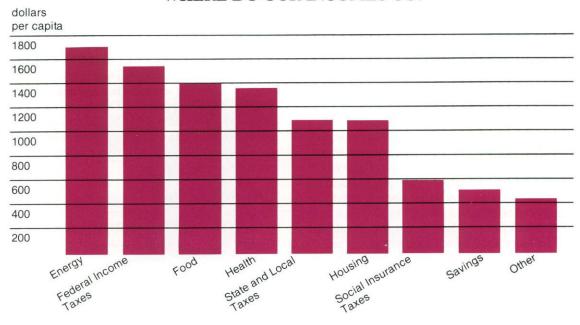


We spend about the same on meat, electricity and school taxes while we spend five times as much on alcohol as we do on public health.

Sources: City General and Special Funds Budget, Selected Items, 1984

St. Paul Food Resources Project Report 1983 Electric and Gas Consumption and Revenues — St. Paul

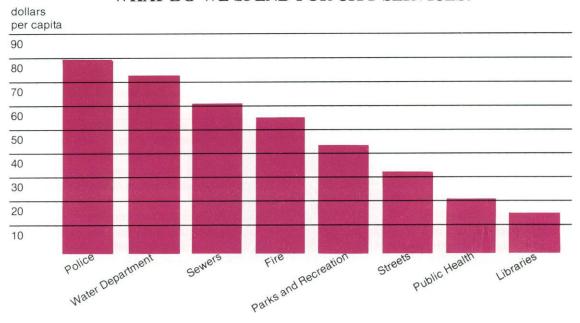
#### WHERE DO OUR INCOMES GO?



In the 1970's oil price hikes pushed energy into the lead. Tomorrow's sprinter is already off the blocks. Health expenses will be the largest item in the budget by 1986 and may double by 1990.

Source: Local Area Personal Income, Bureau of Economic Affairs

#### WHAT DO WE SPEND FOR CITY SERVICES?



Source: City General and Special Funds Budget, Selected Items, 1984

Efficiency improvements may reduce our current energy consumption by 20 to 50 percent with investments that repay themselves in less than 5 to 7 years. This alone could enrich the local economy by as much as \$175 million per year.

Might we not only reduce our imports but also substitute domestic for imported fuels? One such domestic source is the warmth under the ground. The Twin Cities area sits atop five aquifers, waterbearing rock formations that provide almost half the area's drinking water. That water might be cold to the touch but is actually warm. Enough useful energy can be extracted from 45 to 50 degree water, using a heat pump, to heat the interior of buildings.

The water under Saint Paul hasn't gotten any warmer in the last decade. But when conventional costs of energy went from a dime to a dollar a gallon these local sources of warmth became competitive with imported fuels.

Saint Paul's Energy Park may soon be using (and returning to the aquifer) almost two billion gallons of groundwater per year to heat and cool buildings containing more than three million square feet of space at a cost a little more than half that of heating with oil. This could save as much as a million dollars a year in fuel costs.

To allow us the flexibility of tapping into different sources of heat the District Heating Development Corporation (DHDC) has built a thermal network linking downtown businesses and government buildings. By substituting coal for natural gas as the heating fuel the district heating system is saving its customers tens of thousands of dollars a year in fuel costs. In the longer term this thermal grid allows us to substitute other fuel sources, such as wood, as they become competitive.

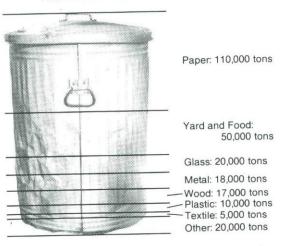
Rules of Thumb It takes about a pound of coal to produce a kilowatt-hour of electricity. (A typical Saint Paul household uses the electrical equivalent of about 700 pounds of coal a month.)

Burning wood instead of coal can benefit Saint Paul many ways. Currently Saint Paul and Minneapolis annually dump 30,000 to 50,000 tons of diseased Dutch Elm trees at the facility at Pig's Eye. To avoid disposal costs the facility has acquired a wood chipper. Until recently there has been only a limited market for wood chips. But soon the district heating system may be up to 50 percent wood fired. This would consume almost all the scrap wood at Pig's Eye.

How would this purchase affect Saint Paul's economy? First, \$250,000 in disposal costs would be saved. Second, more than \$500,000 in gross revenue would be generated. Third, the sale of wood to DHDC at less than the comparable cost of coal will reduce the price DHDC charges its customers for heat. Fourth, a 50 percent substitution of wood for coal may reduce sulfur emissions by up to 95 percent, reducing the need for expensive pollution control equipment.

#### **Knowing Home**

#### WHAT DO WE THROW AWAY?



We throw away 250,000 tons of materials each year. Almost half of that is paper. We throw away enough steel to make about the number of new cars purchased by St. Paulites each year.

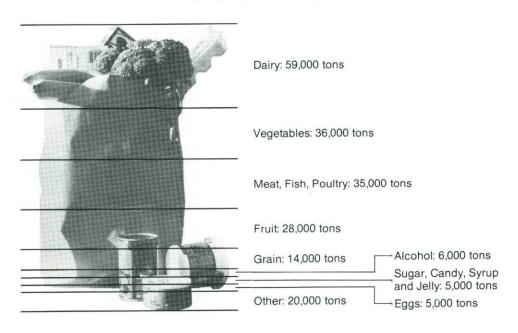
Source: Hennepin County Solid Waste Energy and Resource Recovery Study, 1975 — Ramsey County Data

The multiple benefits of simply burning wood as a fuel rather than landfilling it can add more than a million dollars to the local economy. Systems thinking is a central feature of the Homegrown Economy.

Saint Paul does not have enormous quantities of wood for fuel within its borders. But there are more than 200 square miles of unimproved land in the Twin Cities area that could be used to raise our future fuel supply. Even though Minnesota has abundant wood, the high transportation costs may make local high yield tree farms attractive. An experimental tree farm in Crookston may achieve annual growth rates of 15 to 20 dry tons per acre, two-thirds of which can be used for fuel and one-third for animal feed.

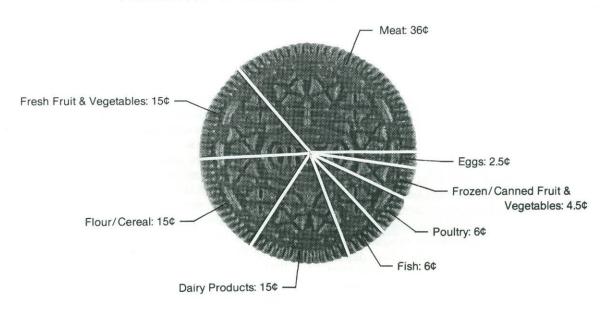
#### WHAT DO WE EAT?

(per year)



On a weight basis we consume as much sugar as we do eggs. The big winner is milk and cream. Source: St. Paul Food Resources Project Report

#### WHERE DO WE SPEND OUR FOOD DOLLAR?



Half our household food budget goes for protein.

Source: St. Paul Food Resources Project Report

Another potential fuel supply, although not yet competitive with coal or wood, is even closer to home. Sunlight. Commercial technologies can now harness and store the warmth of sunlight and can use the sun's gentle power to generate electricity. If we could harness just a fraction of the sunlight that falls on Saint Paul we could be energy self-sufficient. It is not yet economical to do this. But researchers around the world are working to bring the price down. The goal is to convert the vast amount of energy embodied in this sunlight into useful work. As the price of conversion and storage declines the value of the sunshine falling on our streets and buildings and backyards will rise.

#### Waste not, want not.

#### Benjamin Franklin

Fuels represent only a portion of the materials consumed and disposed of in the Twin Cities. Materials handling has become a major economic burden on the local economy. Waste disposal and pollution control are key issues before the Metropolitan Council and many private agencies in the Twin Cities area. The best strategy for alleviating the problems of disposal and pollution may be to recover as much value as possible from our "wastes." Maximizing the "value added" to raw materials and achieving the highest efficiency are twin foundations of the Homegrown Economy.

Rules of Thumb You can plan on onefifth of a pound (dry weight) of body waste per person. Anaerobic digestion of a pound of this material produces 18 cubic feet of gas with a heat value of 650 Btus per cubic foot. (This is enough fuel for two hot showers.)

Consider the problem of tires. These constitute not only a disposal problem but a health hazard. Mountains of tires are nothing less than mountains of oil. A fire can burn out of control for weeks or months. Stagnant water in used tires also may be the primary breeding ground for mosquitoes.

Saint Paul's households and businesses dispose of about 6 million pounds of rubber a year. In 1984 the Minnesota legislature enacted a \$1 per tire tax imposed on vehicles at title transfer. These funds are used to clean up existing tire dumps. The cost to the city just of the clean up tax will be as much as

\$300,000. The cost of disposing of the current annual tire "crop" may be over \$600,000. These expenditures create little wealth for the local economy even if they do create some jobs.

Tires can be recycled. Shredded into two-inch diameter pieces, they can substitute for fuel oil at a competitive price of about a penny a pound. Using tires in that manner reduces the costs of disposal substantially and reduces our oil imports by about \$60,000.

Shredded into finer granules the crumb rubber can be added to asphalt or used as a sealant for roadways. Several test sites in Minnesota are now evaluating this use. At a competitive cost of about eight cents a pound this could generate as much as \$500,000 for the local economy.

Rules of Thumb A used car part should cost no more than 60 percent of the new part list price. A used mechanical or electrical part should go for half the rebuilt and one-quarter the new price.

Or the tires can be shredded and recycled into new rubber products. A regional company, Rubber Research Elastomerics, Inc., has developed a chemical compound which when mixed with the crumb rubber allows it to be made into new products like rubber doormats and gaskets. The value of these products can be as high as 30 cents a pound, resulting in a potential value of more than \$1.8 million for our tires. Indeed, an abundance of such a low cost raw material might spur the creation of new enterprises that devise ways to make even higher value products from the used tires.

Soil. Sunlight. Garbage. What are other overlooked resources?

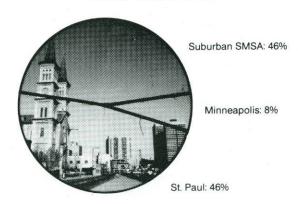
The ground beneath our feet and the people who stand upon it.

The Twin Cities' unusual geological structure makes underground space attractive. A study by the city of Saint Paul identified more than 7,000 acres where there are more than 10 feet of Platteville limestone and up to 80 feet of easily excavated sandstone. The limestone can become the building's ceiling; the sandstone, the floor and walls. In 1983 the Civil and Mineral Engineering building at the University of Minnesota campus in Minneapolis opened with 70,000 square feet of space under the limestone layer.

#### WHERE DO ST. PAULITES WORK?

## Other: 4% Minneapolis: 10% Suburban SMSA\*: 20% St. Paul: 66%

#### WHERE DO THOSE WORKING IN ST. PAUL LIVE?



People increasingly work in one city and live in another.

Two out of every three of us work within the city. But this is down sharply from almost three out of every four in 1970.

Source: Test Your St. Paul Employment and Income I.Q.

More than half of those with whom we work do not live inside the city's limits, a slightly greater proportion than in 1970.

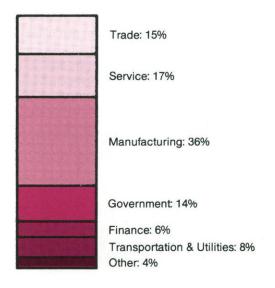
Source: Test Your St. Paul Employment and Income I.Q.

\* Standard Metropolitan Statistical Area: Hennepin, Ramsey, Dakota, Washington, Anoka, Isanti, Scott, Carver, Wright and Chisago Counties in Minnesota and St. Croix County in Wisconsin.

#### **OCCUPATIONS**

# Trade: 25% Service: 23% Manufacturing: 20% Government: 18% Finance: 6% Transportation & Utilities: 5% Other: 3%

#### **EARNING POWER**



We are becoming a services economy. Manufacturing represents only one in five jobs. But those are our higher paying jobs, representing more than one in every three dollars we earn from our labor.

Source: Current Minnesota Labor Market Conditions, March 1984 — Supplement, Ramsey County

Source: Personal Income for States and Counties of the Plains Region, Local Area Personal Income, Bureau of Economic Affairs, 1976-1981 — Ramsey County Data

Underground space has many attractions.

Construction costs can be less than half that of surface construction. Operating costs can be as low as a third that of surface buildings, primarily due to reduced energy costs.

What activities might take place in a city-underthe-city? Storage, recreation, transportation and automated industrial enterprises come to mind. Tennis in February? The University's Underground Space Center sees underground space as an excellent location for high technology medical diagnostic equipment because of the lack of magnetic fields. The vibration free environment makes it an excellent location for highly sensitive electronics manufacturing processes.

And what about PEOPLE?

We know that the market economy is extremely productive. What we fail to take into account is that as much productive work may be done each day on a voluntary basis. Indeed, the backbone of our society is the millions and tens of millions of everyday human transactions.

Ironically if mom or dad makes breakfast for the kids at home they are not counted as part of the "economy." If mom or dad makes breakfast for the kids at McDonald's their labor is recognized. Yet the productive labor is identical.

The amount of productive work that goes on in our households and neighborhoods may be as large as that which is paid for in the conventional economy. If a significant part of our economy is based on mutual aid, then neighborliness becomes a key to a healthy and wealthy city. When families and neighborhoods become disorganized, the voluntary economy shrinks and the need for cash increases. In one city where this has happened one enterprising fellow advertises his "rent-a-neighbor" service. For \$50 a week he will watch the house, take in the paper, feed the pets and water the plants. "Rent-a-grandmother" services for child care have been available for several years.

The city has a long-term collective self-interest in strengthening the voluntary economy. How can we encourage and harness neighborliness? One way is to let neighborhoods deliver services where they are able. Neighborhood Watch programs reduce the cost of police patrols. In Saint Paul neighborhood organizations perform 40 percent of all energy audits. Not surprisingly neighborhood auditors achieve a higher response rate than utility personnel. The customer often knows the neighborhood auditor and knows he or she is available for follow-up questions.

In the future neighborhoods might perform still more formal services. Saint Paul, like much of America is an aging community. The baby boomers are growing old. Health expenditures may well surpass any other single expenditure by 1986. One of the fastest growing medical expenses is care for the elderly. The Saint Anthony Block Nurse Program demonstrates that neighborhoods can deliver health care to the elderly at less than half the cost of nursing homes, with the added advantage that the elderly remain in their communities.

Neighborhood Watch programs, energy conservation, health checkups all exemplify another central tenet of the Homegrown Economy—prevention is inexpensive compared to treatment.

An ounce of prevention is worth a pound of cure. To paraphrase the late economist Ernst Schumacher, the smart person solves problems, the genius avoids them. Preventing disease is easier and cheaper than treating it. Preventing crime is easier and cheaper than treating it. Preventing the decay of our buildings and public works is cheaper than rebuilding them. Reducing our need for new fuel is easier and cheaper than discovering new sources of fuel. Reducing our levels of waste is cheaper than finding new ways to dispose of or recycle them.

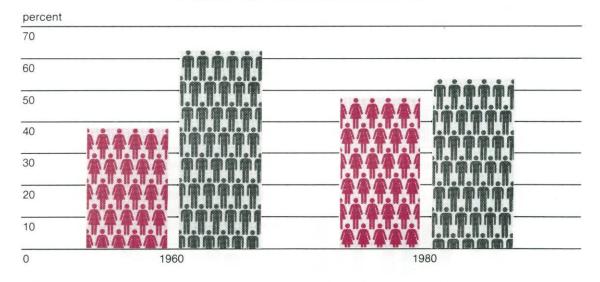




A much higher portion of the population is working now as the baby boom enters the labor force. By 1990 those over 65 may outnumber those under 15.

Source: Test Your St. Paul Employment and Income I.Q. Saint Paul Department of Planning and Economic Development

#### WOMEN IN THE LABOR FORCE



Women Men

If trends continue there will be more women working in St. Paul than men by 1990. As more women entered the labor force the participation rate of men declined. Since 1970 4,900 men have left the labor force while in the same time the number of women in our work force increased by 6,300. Are men choosing to work less while women are choosing to work more?

Source: Test Your St. Paul Employment and Income I.Q. Saint Paul Department of Planning and Economic Development

#### **Encouraging Enterprise**

City: a settlement that consistently generates its economic growth from its own local economy.

Jane Jacobs

Saint Paul's residents may conceive a thousand new ideas every month; only a few become genuine enterprises. Translating theory into practice takes time, money and usually emotional support from friends and relatives. How can we help the process?

Timely and appropriate financing is one way. A new idea is fragile, often languishing for want of a hundred dollars. Macalester College has an entrepreneurial fund from which college students can borrow money to get an idea off the ground.

Once the idea has been tested and the would-be entrepreneur outgrows the basement or backyard garage they need low cost space to rent. Three "incubator facilities" already grace Saint Paul.

Budding businesses are usually financed by loans from friends and relatives. If the business proves successful it needs expansion capital. But new and existing small businesses are not very bankable. The city of Saint Paul helps such businesses obtain bank financing that is guaranteed by the federal Small Business Administration. It is one of the leading cities in the country in securing small business financing, having arranged more than \$170 million in such financing since 1978.

A group of local insurance companies have created a pool of capital targeted for small businesses. The Community Initiatives Consortium has already loaned several million dollars to Twin City businesses that cannot obtain financing through more conventional channels.

**Rules of Thumb** The third restaurant to go into a space is generally the one that succeeds.

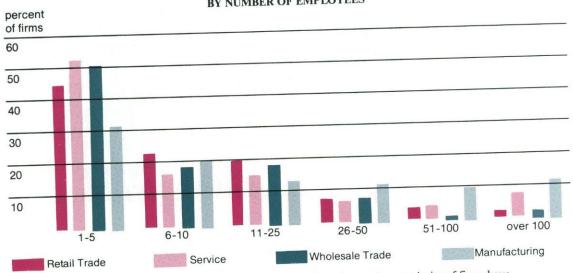
Businesses cannot grow only by assuming more debt. They also need equity financing. The Twin Cities has abundant venture capital but little is available for start-up firms or smaller enterprises or for healthy and expanding businesses unable to achieve high annual returns. Explorations are underway to develop a seed capital fund for those ventures that are economically viable and can contribute to the Saint Paul economy.

**Rules of Thumb** As a rule, 20 percent of a product line produces 80 percent of the profit.

Enterprise comes not only from the founder of the business but from its employees as well. The evidence is overwhelming that when workers

#### **Knowing Home**

#### HOW BIG ARE OUR BUSINESSES? BY NUMBER OF EMPLOYEES



Most of us work with only a few people. Even in the manufacturing sector a majority of firms have fewer than ten workers.

Source: St. Paul Grow Business Survey, Department of Planning and Economic Development, August 1984

achieve genuine participation and ownership then productivity and profits rise.

Employee ownership helps to meet another basic feature of the Homegrown Economy—local ownership. Locally owned firms tend to be more stable. They purchase more of their goods and services from the area. They tend to be more civic-oriented. When the chairman of the board lives in the area, the business tends to take a more active interest in community affairs.

Recent changes in the tax laws make employee ownership a very attractive financing tool. The firm can borrow money from an Employee Stock Ownership Trust and repay the loan with company stock. The firm can deduct the entire loan as a business expense rather than just the interest as in the case of a conventional loan. This translates into lower borrowing costs and a more competitive position by the firm. The 1984 tax law makes employee ownership even more attractive by allowing banks that lend to such trusts to deduct half of their interest income from their taxes, again potentially lowering the cost of money to the firm.

## Rules of Thumb A flower shop or plant store should plan on spending 2 percent of its gross sales on advertising.

Employee ownership may be an excellent alternative to the buyout of a local firm by outside investors. Moreover it becomes a way for the aging founder of a firm to get his or her money out without liquidating or selling to a larger corporation.

Like businesses and individuals, neighborhoods often need a helping hand to get a large project off the ground. The St. Paul Housing Corporation, started with funding from the St. Paul Progress Corporation, a consortium of downtown business firms, will lend money to neighborhood organizations who are becoming housing renovators and developers.

The city's Neighborhood Partnership Program (NPP) has channeled more than \$2 million to neighborhoods on a competitive basis for economic development projects and/or minor public improvements like planting trees, installing new street lights, or renovating homes or commercial buildings.

The neighborhood decides what it needs and applies for city money. The neighborhood must match the city's money with an equal or greater contribution of its own. Neighborhoods with higher incomes must contribute three dollars of

neighborhood resources for every dollar of NPP funds they receive. Lower income neighborhoods must contribute one dollar for every one dollar they receive in NPP funds. Counted as a contribution is something neighborhoods have a lot of—"sweat equity." Volunteer time is valued at \$10 per hour.

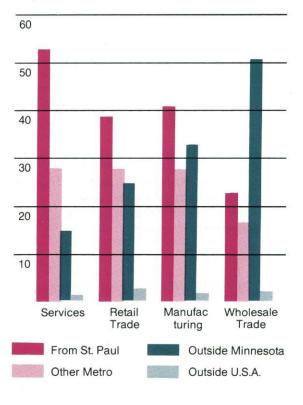
The great end of life is not knowledge but action.

**Thomas Fuller** 

#### **Knowing Home**

#### WHERE DO BUSINESSES BUY THEIR GOODS AND SERVICES? BY TYPE OF BUSINESS

percent of purchases



The raw materials for our manufacturing industry come largely from outside the state while the raw materials for our service sector mostly lay within our city borders.

Source: St. Paul Grow Survey, Department of Planning and Economic Development, August 1984

#### **Exporting Our Expertise**

Localism isn't isolationism. Progress comes from sharing the fruits of invention. Robert Green Ingersoll, the great orator of the last century accurately described commerce as "the great civilizer. We exchange ideas when we exchange fabrics."

Recognizing the need to increase our exports the city's businesses and government have created several new means to do precisely that. One market that has been difficult for small- and medium-sized firms to tap is the federal government. The Council for Economic Self-Reliance, a body consisting of representatives from Saint Paul's business, labor and governmental sectors has created an agency to help these businesses to bid on federal contracts. In keeping with the tenets of the Homegrown Economy the agency is supported by loans, not grants and will earn its revenue from the success of its efforts.

Successful bids will bring money to the local economy. Perhaps of more importance for the long term, it will help us to identify those local firms that can meet the rigorous technical specifications and strict budget and time guidelines of the federal government. Firms that can successfully do this could also become major suppliers of goods and services to the larger corporations in the Twin Cities. Subcontracting like this can keep money recycling.

The Homegrown Economy encourages innovation. Inventions that embody the basic principles of the Homegrown Economy like higher efficiency and greater value added should be marketable to a world that is not nearly as rich as is our society in money or natural resources. The

Minnesota World Trade Center is the city's primary effort to link small- and medium-sized businesses into the global market. In turn it is linked to many parts of the Homegrown Economy. One floor of the building will comprise an incubator facility. The center will be connected to the city's district heating system and might later be connected to an underground space network.

The man who trades independence for security usually deserves to end up with neither.

Benjamin Franklin

\* INVENTION \* INNOVATION \* SELF-RELIANCE \* MUTUAL ASSISTANCE \* EFFICIENCY \* RISK \*

These are some of the keywords of the Homegrown Economy. These principles can be applied to any sector of the community, from the educational system to the social service system. One sector reinforces another. Changes in several can have a cumulative effect on the local economy.

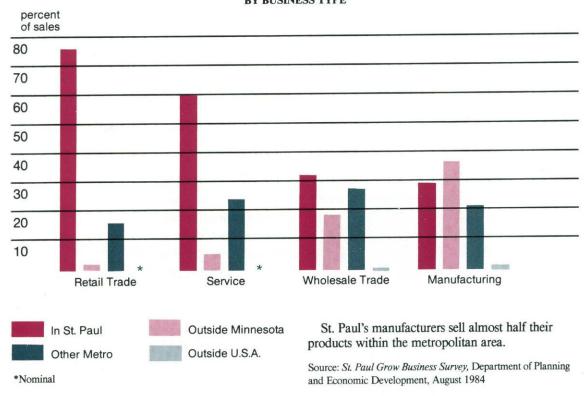
City government can act as cheerleader, promoter, occasional financier to "prime the pump" and as a toolbox of technical advice and assistance. But the city of Saint Paul is no more its city government than it is its downtown. Shakespeare said, "People are the city." By tapping into our collective wisdom and our human ingenuity we can make our city more self-reliant and our economy more resilient. At the same time we can give more protection and security to our poor and our infirm. Wealth begins at home.

#### **Knowing Home**

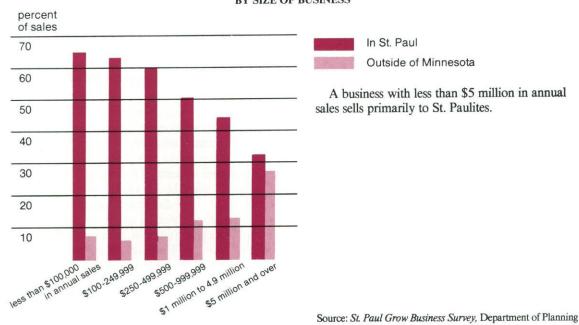
#### A PROFILE OF THE HOMEGROWN ECONOMY

- Local ownership
- 2. Employee and community participation
- 3. A willingness to take risks
- 4. Inventiveness
- 5. Getting the most out of local resources
- 6. Substituting local goods and services for imported products
- 7. Preventing problems from arising rather than treating them after the fact
- Expanding exports

#### WHERE DO OUR BUSINESSES SELL THEIR GOODS AND SERVICES? BY BUSINESS TYPE



#### WHERE DO OUR BUSINESSES SELL THEIR GOODS AND SERVICES? BY SIZE OF BUSINESS



and Economic Development, August 1984

#### BUSINESSES WITH 500 OR MORE EMPLOYEES IN THE ST. PAUL AREA

ARA Transportation, Inc.

American Hoist and Derrick Company

Baptist Hospital Fund, Inc.

Bethesda Lutheran Medical Center

Blue Cross & Blue Shield of Minnesota

Brown and Bigelow Company, Inc.

Buckbee-Mears Company

**Burlington Northern** 

Cardiac Pacemakers, Inc.

Champion International Corporation

Chicago & North Western Transportation Company

Children's Hospital, Inc.

Coca Cola Bottling Midwest, Inc.

College of Saint Thomas

Commonwealth Electric Company

Control Data Corporation

Economics Laboratory, Inc.

First Bank Saint Paul

First Computer Corporation

Ford Motor Company

Gillette Company, Inc.

Gould, Inc.

Honeywell, Inc.

Independent School District No. 622

Independent School District No. 624

Independent School District No. 625

Koch Refining Company

Land O Lakes

Marsden Building Maintenance Company

Minnesota Mining and Manufacturing Company

Minnesota Mutual Life Insurance Company

Minnesota — State of (Offices)

Modern Service Insurance Company

Montgomery Ward and Company, Inc.

Moundsview School District No. 621

Mutual Service Insurance Company

NCR Comten, Inc.

Nidec America, Inc.

Northwest Airlines, Inc.

Northwest Publications, Inc.

Pabst Brewing Company

Pearson Candy Company

Prom Catering Company, Inc.

Ramsey — County of (Offices)

Saint John's Lutheran Hospital Association

Saint Joseph's Hospital, Inc.

Saint Paul — City of (Offices)

Saint Paul Companies

Sperry Corporation

Sperry Rand Corporation

State Farm Mutual Insurance Company

United Airlines, Inc.

United Hospitals, Inc.

United States Department of Defense

Veterans Administration

Webb Company, The

West Publishing Company

Western Life Insurance Company, Inc.

#### THE SAINT PAUL WORLD TRADE CENTER

he St. Paul Pioneer Press/Dispatch editorial crowed, "Trade Center crisis shows city's finest." "St. Paul Mayor George Latimer has talked frequently since October 1982 about his dream of a self-reliant city... When he first made those comments ... Mr. Latimer could not have had any idea how severely his commitment to that concept would be tested concerning the Minnesota World Trade Center. The failure of the city early this month to win a crucial \$9 million Urban Development Action Grant from the Reagan Administration left the entire \$100 million...project teetering on a precipice. But not for long. This was the time to test the notion of a self-reliant city and St. Paul was found not wanting ... The World Trade Center became a rallying cry... Union heads with their pension funds, bankers, City Hall chieftains, business leaders, developers, elected officials, utility company moguls and concerned citizens all came forward to offer help and ideas."

With the last minute help of the unions, the city, the business community and the Port Authority of Saint Paul the 850,000 square foot World Trade Center will be completed in 1987. It will act as a link between small- and medium-sized Minnesota businesses and the global economy.

According to Richard Broeker, director of the center and one of the homegrown architects of the Homegrown Economy program, "As of last year 80 percent of the exporting done in this country was achieved by less than one percent of the corporations... There are language problems, legal and sales problems, shipping problems and licensing problems, all of which to the small- or medium-size businesses tend to be very difficult to overcome. The trade center as a one-stop service for all your trade needs will help solve those problems. The trade center will be the visible link between the Saint Paul economy and the global economy."

The Department of Commerce estimates that for every \$45,000 in exports one job is created. And more jobs will be created by the new firms and the new tourist travel that the World Trade Center will attract to downtown Saint Paul.

Even before the pilings go down on the large building the Minnesota World Trade Center has opened for business in the ConWed Tower. We expect that the initiative and inventiveness of Minnesotans will soon, with the help of this new agency, be on display in stores and factories and households throughout the world.



#### THE SAINT ANTHONY PARK BLOCK NURSE PROGRAM



Eileen Stack (right), a nurse in the Saint Anthony Park Block Nurse Program, supervises a client who gives herself an insulin shot while the woman's twin sister looks on. The program, run by registered nurses and volunteers living in the Saint Paul neighborhood, allows elderly clients to stay at home while receiving the care they need. The services cost less than those of other home care agencies.

Maybe our neighbors. Saint Paul, like much of the rest of the country is an aging community. By 1990 we will have more people over 65 than under 14. Health care is our fastest rising expenditure, and care for the elderly is the fastest growing component of health care. The expense of taking our parents out of their homes and communities and putting them in nursing homes has become so great that neighborhoods are designing alternatives. Such as the Saint Anthony Park Block Nurse Program.

More than 10 elderly persons in Saint Anthony Park might be in nursing homes rather than in their own homes if it were not for this unique, 3-year-old program run by registered nurses and volunteers living in District 12.

The program evokes a kind of Good Samaritan spirit because neighbors care for neighbors. Both the care givers and those who receive care live in the Saint Anthony Park area. Theoretically that means

better and more cost-effective care. "The key is we all live in the same neighborhood," says Marjorie Jamieson, program director. "I'm going to deliver a different kind of service than if I'm called in from Apple Valley. After all, I'm going to see that person's son at the grocery store or her daughter at church."

The program costs less than other home care agencies because it uses area professionals—thus cutting transportation time and costs—and because it involves the family and volunteers in the care giving. Nursing homes cost between \$1,200-1,800 per month. The block nurse program costs on average about \$350 per month per client.

The block nurse program is supported from various sources. Clients pay about a quarter of the costs, on sliding fee scale. Alternative care payment programs and medicare picks up another quarter. Half the cost is picked up by H.B. Fuller Company, Medtronic Foundation, F.W. Bigelow Foundation, St. Paul Foundation and from neighborhood fund drives.

#### SAINT PAUL PROCUREMENT OUTREACH PROGRAM

o business should ignore its largest potential customer. Yet that is precisely what small businesses in Saint Paul had been doing. Uncle Sam is the largest buyer of goods and services in the nation, spending more than \$160 billion a year. But small businesses often lack the time and expertise to wend their way through a federal purchasing maze that consists of more than 100,000 buyers operating out of 5,000 offices.

To solve this dilemma the Saint Paul Council for Economic Self-Reliance, Inc. established a Procurement Outreach Program. The program operates essentially like a matchmaker, matching competent local firms with federal buyers.

The first step is to screen local businesses eager to tap the federal market. "We assess their production capacity as well as their technical and administrative ability before encouraging them to proceed," says Richard Dana, director of the program.

The second step is to develop a marketing strategy for the local business. Dana's staff mixes technical assistance with sober advice. "The size, diversity, consistency and predictability of the federal market make it extremely attractive," Dana observes, "but businesses also need to be aware of the risks, hazards and obstacles involved." The

program staff urge local businesses to recognize the federal opportunity for what it is, without becoming dependent or overwhelmed by it. Selling to the government helps businesses to offset seasonal swings and to counteract the business cycle by making better use of their productive capacity.

The program collects information on upcoming federal purchases and helps the business go through the bidding, award and completion stages. Similar programs in other cities have produced astonishing returns to the local economy. Tens of millions of dollars of new work have been added to economies no larger than that of Saint Paul.

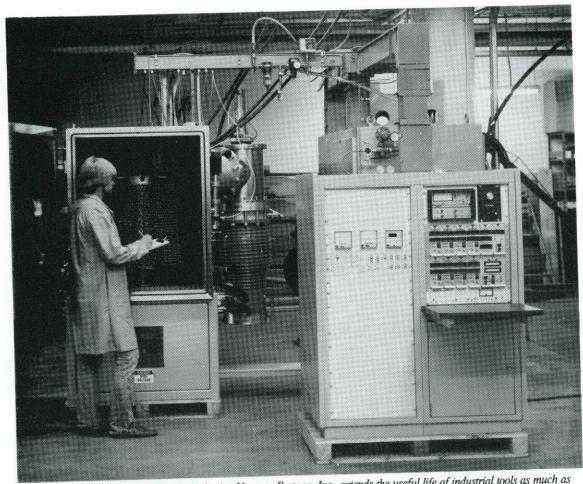
The unique aspect of Saint Paul's program is its lack of dependence on grant funds. All funding is in the form of loans; two-thirds came from the private sector. Businesses pay a 3 percent fee-for-service on successful contract awards. This revenue should be sufficient to repay the initial funding and to sustain the operation in the future.

The program expects that successful local bidders will develop the confidence and capability to effectively compete on their own. Successful firms are expected to "graduate" from the program, freeing themselves from the 3 percent fee and allowing the staff to devote their time to new recruits.



Saint Paul entrepreneur Bill Huestis of Road Rescue, Inc., talks with Catherine Stevens and Dennis Williams of the city's Procurement Program. The program helps small businesses secure federal government contracts, a market worth over \$160 billion a year.

## MULTI-ARC VACUUM SYSTEMS, INC.



Reducing waste the high-tech way, Multi-Arc Vacuum Systems, Inc., extends the useful life of industrial tools as much as ten times over with its coating process. The Saint Paul company has agreements with other firms to begin exporting its services to the Far East and Europe as well as throughout North America.

ant to reduce waste the high-tech way?
Peter D. Flood, president of Multi-Arc
Vacuum Systems, Inc., offers an
inexpensive way to coat tools so that they last many
times longer.

Simply place the tools inside a vacuum chamber. You can even look through a little window and witness the coating of the tool with a few molecules of titanium nitride. A plasma is created and ions of vapor of titanium react with nitrogen to form the coating. Drills coated by this process will last up to ten times longer than uncoated drills.

The technology was developed by the Russians and brought to this country by a New York entrepreneur named Joseph Filner, and by Control Data Corporation's World Tech subsidiary. Control Data is also a major investor in Multi-Arc.

The Russians came to demonstrate their technology in the late summer of 1980. By the spring of 1981 an American prototype was operating and Multi-Arc had five employees. Today it has over 80 employees and occupies more than 16,000 square feet in Control Data Corporation's downtown Saint Paul Business and Technology Center.

Multi-Arc initially provided coating services, but later sold machines directly to firms in major industrial areas like Detroit and Chicago who can offer that service.

Flood sees a rosy future. Thin film coating has so far been done on relatively high-priced items, but as the costs drop and experiments with other elements besides titanium prove successful, it may be possible to coat not only expensive cutting tools but inexpensive washers.

The coating business is fiercely competitive. However, Flood believes the vapor deposition process developed by Multi-Arc has several key advantages over other coating systems.

In 1984, three major international corporations supported this belief by forming partnerships with Multi-Arc to exploit its coatings technology on a worldwide basis. Joint venture agreements were reached with Cleveland Twist Drill (North American market), Sumitomo Corporation (Far East), and Siemens AG (Europe). So while Multi-Arc may only be four years old, it has suddenly become a significant force within the international coatings industry.

To Flood, the recent awareness of the environmental costs to ground water supplies and soil from dumping of heavy metals and toxic wastes can make the Multi-Arc coating process even more attractive. For example, if the EPA regulations concerning chrome plating are tightened, the technology Multi-Arc has developed can become competitive with that major industrial process.

Peter Flood, an Englishman, is impressed with the inventiveness and expertise of Saint Paul's workforce. "We hired an electronics engineer through the state employment services," he recalls, "and told him we wanted digits rather than dials and pointers on our meters. In one weekend he had solved the problem and breadboarded the circuits."

High tech means many things to many people. In the case of Multi-Arc Vacuum Systems, Inc. it means using ingenuity and sophisticated science to extend the life of our tools and perhaps reduce pollution. It also represents a new technology which has major benefits with the "smokestack" industries of the world.



## THE DISTRICT HEATING DEVELOPMENT COMPANY

hat do the St. Paul Hotel, the St. Paul Public Library, Minnesota Public Radio and Dayton's have in common? They're all heated by Saint Paul's newest energy utility, the District Heating Development Company (DHDC), a private, non-profit company.

In the face of growing uncertainty about the price and availability of fossil fuel, the best energy system is one that doesn't rely on any one fuel. Now heat energy produced from the most economical fuel available can be distributed through the thermal grid lying under downtown streets.



A pipe grid beneath the streets now delivers heat to over one-half of the buildings in downtown Saint Paul. Completed months ahead of schedule and \$1 million under budget, the city's downtown district heating system is designed to operate on any fuel.

Saint Paul's is the largest hot water district heating system in the nation. And one of the best managed. On November 30, 1984, Hans Nyman, a Swedish expert on district heating and the president of DHDC proudly announced that the downtown construction was completed a year ahead of schedule and more than a million dollars under budget! Only 18 months after groundbreaking the system was supplying heat to over one-half of the buildings in Saint Paul's central business district. By the end of 1985, the system will be delivering 160 megawatts of heat!

How big is a megawatt of heat? The largest commercial office building on the system is the First National Bank of St. Paul, a 525,000 square foot building. It has a heating demand of almost two megawatts.

DHDC's success is a result not only of creative engineering but also of creative financing. Raising the \$45.8 million necessary when energy prices were rising and falling and interest rates were skyrocketing was itself no mean feat. A mixture of floating rate monthly demand notes, a federal grant, and tax increment funds supplied the cash.

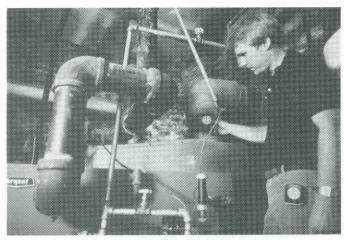
DHDC is controlled locally by a seven-member board of directors. Customers elect three board members. The mayor appoints three and the seventh is elected by the other six.

With its downtown system complete, DHDC proposes to expand to neighborhoods on the downtown fringe in 1985. After all, its piping system can meet twice the load now connected, and it has heat sources that can meet an additional 40 megawatts. Today downtown, tomorrow the city.

DHDC is also searching for cheaper and more localized fuel sources. It is testing the feasibility of substituting local waste wood for coal.

In 1979 a district heating system was only a dream. Today it is giving the other utility, Northern States Power Company, a run for its money.

### THE ENERGY RESOURCE CENTER



Valdi Stefanson, building energy specialist for the Energy Resource Center (ERC), tests a steam boiler's efficiency.

ant to save money with no risk?
Contact the Energy Resource Center.
Established in September 1981 as a
nonprofit joint venture between local utilities and
the city of Saint Paul its original mission was to
provide a "one-stop conservation service" for single
family residences. Using tax exempt bonds and
funds from various agencies it provided \$4 million
in low interest loans to energy conservation.

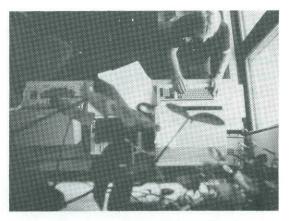
But ERC found that the demand wasn't sufficient even though the energy savings were there to be had. This was particularly the case in rental properties. So in March 1983 it established an Energy Management Service for rental properties. Under this service ERC takes the worry out of energy conservation. The energy savings pays for the building audit, scheduling and supervising all work to be done, the capital improvement costs, and the final inspection.

Financed in part by a loan from the Family Housing Fund, ERC invested almost \$300,000 in rental property improvements by the end of 1984 and expects to expand the program considerably next year. Annual savings range from 20 to 60 percent with an average to date of 40 percent. The

property owner pays what he would have paid the utility company for fuel had no work been done. In turn, ERC pays the new lower fuel bills, retires the debt incurred to make the improvements, and covers some of its expenses and overhead with the savings.

"It's hard work. It takes a lot of experience to do this well," says Tom Griffin, executive director of the center. ERC may soon be selling that expertise. With the aid of financing from the Neighborhood Energy Project in the Snelling-Hamline neighborhood in Saint Paul, ERC has developed a sophisticated software system to track accounts under this complex system. The neighborhood's investment will be repaid through royalty payments from the sale of the software and technical assistance package.

Tom Griffin sees the work of the center as "equivalent to rebuilding and maintaining our bridges and roads." The buildings of the city, to him, are a long term asset. And improving these assets generates jobs. "Seventy cents of every dollar we spend stays in the local economy," Griffin proudly announces, compared to only 20 cents on the dollar spent for fuel oil or natural gas.



Using a computer simulation, an Energy Resource Center specialist predicts fuel savings that will result from recommended energy improvements. The ERC guarantees its estimated fuel savings to the point of absorbing the loss for the property owner if those savings are not realized.

## THE INCUBATOR FACILITY

small business usually starts at the kitchen table and then moves down to the basement or into the backyard garage.

The next step is a big one: getting a place of one's own. "Small businesses don't have a lot of cash upfront," says David Gontarek, the original manager of the city's incubator facility at 2325 Endicott Street. "If they have to purchase a building or pay a high rate for space and then put a lot of leasehold improvements into it, their cash is tied up and can't work for them. That means their growth is slowed and with it the potential for more jobs."

Building on the experience of other cities and the success of the Business and Technology Centers developed by Control Data Corporation Saint Paul decided to use \$600,000 in federal job creation funds to create an incubator facility. Kathleen Callahan, then project manager and now deputy commissioner for the Minnesota Department of Energy and Economic Development says, "It became apparent (that we) could produce immediate jobs by simply renting to small businesses at a lower rate."

Three Saint Paul businessmen, including Charles McCann, had purchased and renovated a 60,000 square foot warehouse two years earlier. Rather than buy the building ("We didn't want to be a landlord," says Callahan) the city provided fixed-rate, first mortgage financing to McCann and his associates. The city is repaid the loan with interest, and has the right to lease 20,000 square feet of incubator facility at no cost for three to 12 years. The city then leases this space at low cost to the tenants. Moreover, the city gained a commitment from McCann to use the proceeds from the

mortgage to develop another property he owns in the area.

The incubator facility opened its doors in February 1984. Today it is fully occupied. Eight fledgling businesses call it home. They range from a food vending service and a manufacturer of draperies and athletic uniforms, to a manufacturer of energy efficient carburetors for boiler systems.

"These are the type of tenants," McCann observes, "who would go to the average warehouse owner looking for 1500 square feet of space, only to discover that the owner wouldn't rent them that small a space." One tenant, a consulting firm, rents only 350 square feet. Rents range from \$1.40 to \$2.35 per square foot.

"The bottom line here is the growth of each business," says Robert Kessler of the city's Department of Planning and Economic Development. "We are in the business of 'graduating' bankable tenants."

What do the tenants think? David Karter of Boiler Trim, maker of computerized intake draft systems that operate like a carburetor for industrial and heavy commercial boilers says being in the incubator has affected his attitude about staying in Saint Paul "quite radically. We know that at least there's a few people out there trying to do something to help small business get moving."

Steve Becher of Becher Enterprises, provider of coffee services and snacks on the honor system to businesses too small to support vending machines, not only doubled his business but also created a second company during his six months in the incubator. He intends to remain in the city. "The community is showing support for us," he gladly proclaims.



## THE SUMMIT BREWING COMPANY

ark Stutrud is proving that with a lot of hard work and determination a hobby can become a business. After brewing beer at home for two years Stutrud, a former social worker, attended a conference on beer brewing in Boulder, Colorado and discovered the emergence of a new industry—the microbrewery.

A microbrewery is tiny compared to conventional breweries. Each produces thousands of barrels a year rather than the millions, or even tens of millions of barrels a year made in conventional breweries. The microbrewery is new. More than 20 microbreweries are operating throughout the United States. None is more than six years old. Each produces a beer with a distinctive taste. "American lagers represent a narrow flavor profile," says Stutrud. "Consumers are looking for something different. They are discovering there are as many types of beer as there are wines."

Stutrud learned from other pioneers. In 1984 he took a course from William Newman, founder of the Wm. S. Newman Brewing Co. in Albany, New York. He also attended the Siebel Institute of Technology in Chicago, one of the country's oldest

brewing schools. A small grant from the city allowed Stutrud to bring in the master brewer who helped found Seattle's Red Hook Ale Company to explore the feasibility of starting one in Saint Paul. The brewer convinced not only Stutrud but himself as well. He is now an investor in the Summit Brewery.

The city's small business division helped locate a suitable building and provided The Summit Brewery Company a \$50,000, eight percent economic development loan.

By the end of 1985 Saint Paul should have its third brewery. Unlike the Schmidt and Stroh's facilities this will be only for local consumption. "Part of its appeal is that the beer will only be available in the metropolitan area", says Stutrud, "You won't be able to find it elsewhere."

The Summit Brewery expects to demonstrate that small production facilities do not necessarily suffer much higher production costs. With a facility a thousand times smaller than those of the giant breweries Stutrud expects his price to be only slightly higher and to compete favorably with premium and imported beers.



## EAST SIDE NEIGHBORHOOD DEVELOPMENT CORPORATION

mall is beautiful on the East Side. When the neighborhood decided that its first priority should be to upgrade Railroad Island, a community of 450 homes and about 1,200 people it turned to the East Side Neighborhood Development Corporation to take the lead.

And take the lead it has. The corporation received a first place award in a design competition for low cost homes run by the city. With financing from the Family Housing Fund, eight 900 square foot, two-bedroom homes with full basements, and super-insulation were built under ESNDC's direction.

The project just broke even. A major problem was the downturn in the real estate market in 1983. But it was also a good learning experience. By late 1984, seven of the eight units had been sold.

The project whetted the organization's appetite for development. In 1984 it received funding from the Neighborhood Partnership Program for commercial and residential rehabilitation. The corporation acts as staff for the merchants association's efforts to upgrade the commercial strip on Payne and Arcade.

More projects are in the planning stage. The corporation expects to oversee the construction of eight 1,100 square foot, three-bedroom units on land it owns. Always innovative, the Corporation will have the owners do 50 percent of the construction work. A supervisor will be on-site to divide the eight families into work crews. Another unusual feature of the project is that each family

will work on all houses. No one moves in until all eight buildings are completed. Each family must work at least 30 hours per week. In return they expect to save as much as \$15,000 or 15 to 20 percent of the cost of a comparable contractor-built home.

The ESNDC is not only interested in the cost of constructing a home but in the cost of operating it as well. In 1983 it completed the first superinsulated home. Energy bills dropped from \$850 a year to \$300 a year. A second super-insulated home was completed in 1984.

ESNDC has also audited 1,200 homes in the area, providing a service comparable to that offered by NSP but at half the cost. And the ratepayers money is kept in the community!

In one three-block area the neighborhood corporation has removed several condemned houses. Most have been replaced with new houses. Under its supervision 16 new units of housing will have been built by mid 1985 and another 15 will be rehabbed by that time. "That's a very large impact in such a small area," says Al Lessick, a member of the corporation, with justifiable pride.

The next step? Several years ago the city of Saint Paul purchased land on the Rivoli Bluff for later use by the neighborhood development corporation. Its role will be to make sure the development is compatible with the neighborhood's goals, and to act as developer to make sure that neighborhood residents and those in need will have an opportunity to live there.



With help from the Saint Paul's Neighborhood Partnership Program, this home at 745 York will have new siding. Homeowners received partial funding for external improvements in a project coordinated by the East Side Neighborhood Corporation.

## INVENTING THE FUTURE



"...there are 72,000 people going to work using my equipment," says Saint Paul inventor Herb Dalglish. Of his 158 patented inventions, only two have failed to find a market.

he newspaper you read, the cookies you eat and soon the intravenous solution you receive may all come to you via the genius of Herb Dalglish, Saint Paul inventor extraordinaire.

Born in 1911 at St. Luke's Hospital in Saint Paul, Dalglish had the good fortune to work in the J.M. Dalglish & Company in the 1930s. His father founded the company and his mother and brother worked alongside him. The company was a manufacturer of many products and a leading research and development firm working with new materials.

Dalglish's received his first patent in 1935. He noticed that parts of sausages were falling off in smoke houses. "Why don't the companies put something around them to stop them from falling off," he wondered. Voila! The wiener bag, a knit cloth bag that caught on quickly with sausage companies and packers.

When the family business was sold in 1949, Herb Dalglish became a full time independent inventor. He developed a bug detector system for grain elevators. Surmising that the body heat of multiplying bugs would raise the inside temperature

Dalglish dropped a cable down the grain elevator with heat sensing devices every five feet. He later received 10 more patents for improvements on this basic detection system that is still dominant today. "Since 1952 the cookies you eat I helped to make," he proudly announces.

The University of Wisconsin says that out of every 100 new product ideas only two will ever make it to market. But only two of Herb Dalglish's 160 inventions ever failed to receive patents and only two of those patented ever failed to find a market. One reason for his extraordinary success is his ability to combine inventiveness with salesmanship. "I enjoy selling as well as inventing," he says.

Dalglish also believes strongly that the successful inventor always retains ownership of the patent. "Don't ever assign a patent," he cautions young inventors. "License them."

"I've got some inventions going back to the 1940s and 1950s that I'm still getting monthly checks for because I didn't sell the patents," he explains.

To Dalglish "invention is the father of employment."

"My greatest satisfaction is that there are 72,000 people going to work using my equipment," he proudly announces, equipment like several devices that have modernized today's web-fed printing processes.

Dalglish has had seven heart attacks, ulcers, and phlebitis. Having spent so much time in the hospital it is no wonder that his fertile mind began to focus on medical problems. In 1984, a local hospital, Saint Joseph's, and Dalglish agreed to a plan for an entrepreneurial division. Together, Dalglish and the hospital staff would identify "trouble spots."

"If you don't have a problem, you don't have the opportunity for invention," he says.

He is not paid staff although he has an office at the hospital. "A paid inventor doesn't get a big payoff from his invention," he cautions. The hospital will gain the exclusive license to make or market the patent. Dalglish will earn a license fee on the use of the patents. His first idea is to attach a device to heat the intravenous fluid before it enters to body. "Forty degree fluid entering a 98 degree body shocks the system." He sees a potentially large market.

Inventing may be more the result of an attitude and a state of mind than of formal education.

Dalglish didn't receive his mechanical engineering degree until long after he received his first patent. He has been an advisor to inventors and a teacher to younger would-be inventors. Having given summer courses to kids he was pleasantly surprised at the inventions coming from third to ninth graders.

Dalglish was inducted into the Minnesota Inventors Hall of Fame in 1983, and has belonged to the Saint Paul and Minnesota Engineering Societies since 1945. "Many inventors seek business advice to develop their products," says Dalglish, "and S.C.O.R.E. (Service Corps of Retired Executives) provides an excellent service." S.C.O.R.E. refers inventors on a regular basis to Dalglish, who provides technical advice as well as procedural information which serves to protect the invention.

Inventiveness is only one side of Herbert Dalglish. He is also a praiseworthy citizen. Named West Side Citizen of the Year in 1982, he has been a leader in civic campaigns in that area. Whether the cause is a new neighborhood park and play area or a fight against Northern States Power's plan to burn PCBs, a chemical pollutant, Herb Dalglish uses his genius to strengthen the community.