



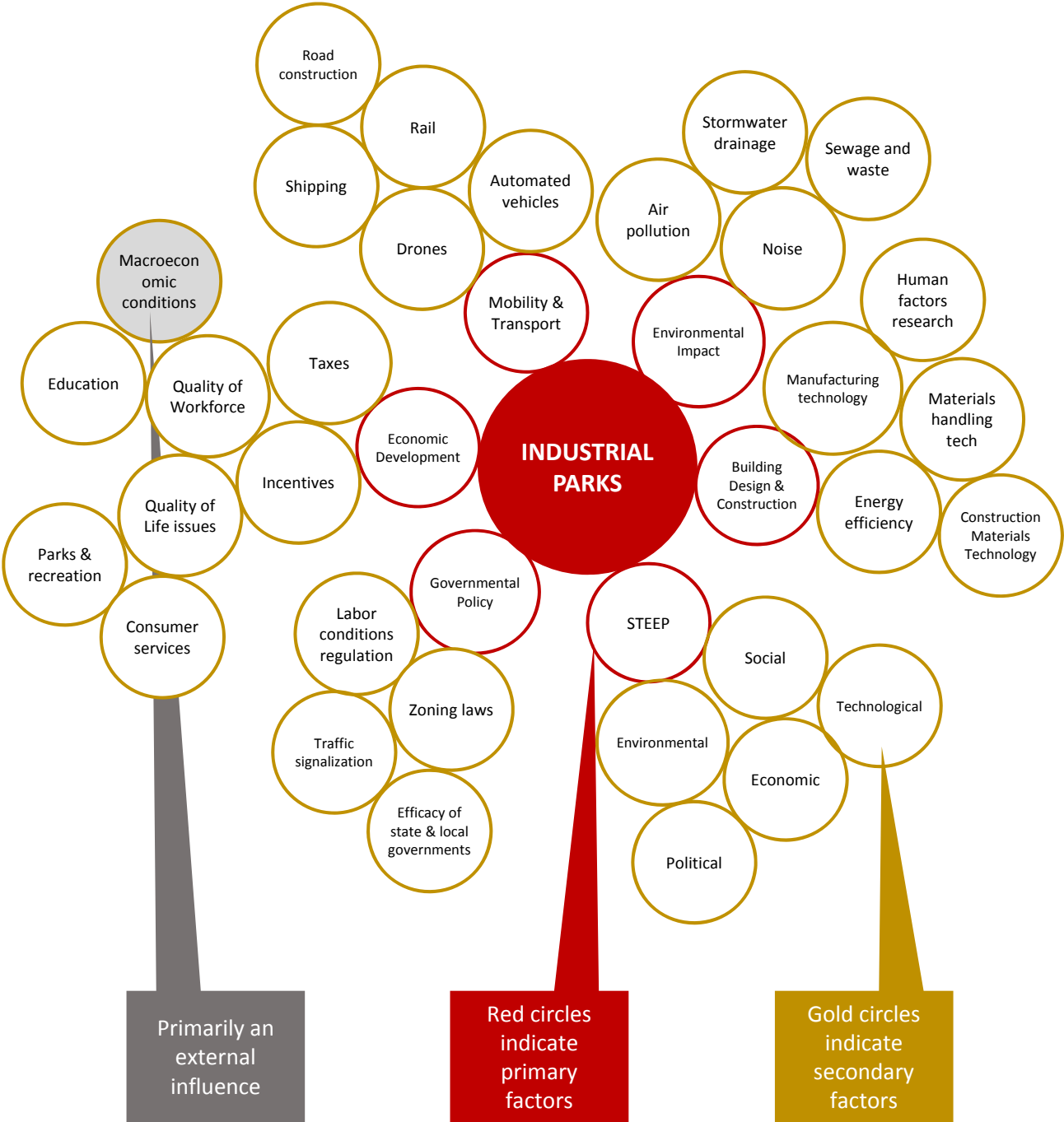
The ***Future*** of Industrial Parks
An Outlook to Year 2027

for
Texas Department of Economic Development
Society of Industrial and Office Realtors

SUMMARY

Industrial parks are an integral part of the economic infrastructure in Texas, playing a key role as an attractor in economic development efforts that make the state a place of growth and opportunity. The parks are in turn impacted by a great number of factors, and themselves create reciprocal influences on these factors.

THE DOMAIN



SUMMARY

The key stakeholders are a mix of government agencies, manufacturing concerns, and service providers who facilitate transactions between and among the previous two, and guide investment decisions. They are all united by a commonality of interests and fears.

KEY STAKEHOLDERS

- ***Economic Development Agencies:*** public-private partnerships seeking progress and growth which create jobs, prosperity, and a broadened tax base



- ***Real Estate Developers:*** private sector investors or professional developers who seek a return on investment; industry is a key client



- ***Industry:*** private businesses who produce or develop goods; they seek profitability and seek effective facilities to help achieve this goal



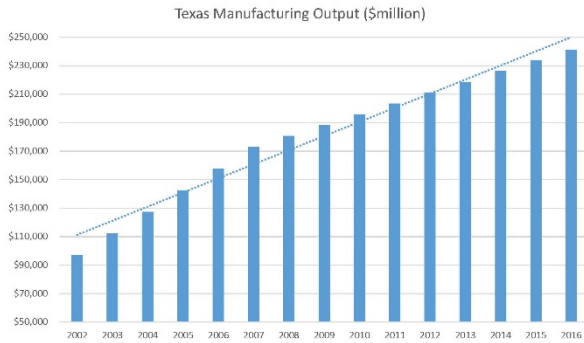
Desires: overwhelmingly, economic progress and stable policy

Fears: political instability and (for some) rising taxes

SUMMARY

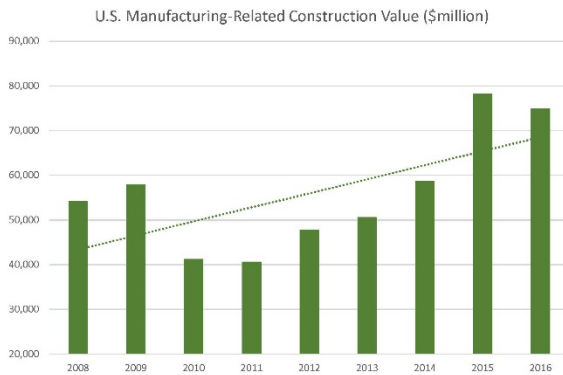
Economic conditions in the state have been robust for an extended period of time. However, this has not necessarily translated into strong job growth, due to technological advances and offshoring of manufacturing. Thus the backlash.

CURRENT SITUATION



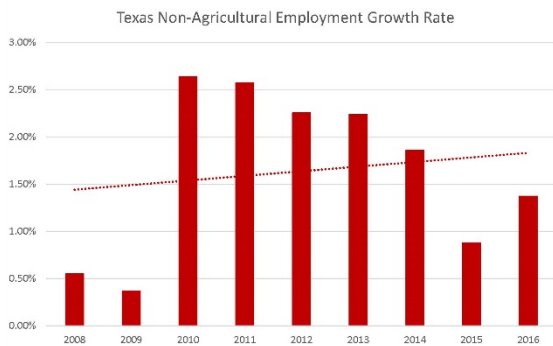
Source: U.S. Department of Commerce

- **Output Up:** Texas manufacturers output growth rate 28% annually since 2009



Source: U.S. Department of Commerce

- **Construction Up:** manufacturing construction put-in-place up 29% per year since 2009



Source: Texas Workforce Commission

- **Employment Lagging:** growth rate in jobs nearly static annually due to automation

- **Globalism Challenged:** shift to aggressive public policy favoring basic manufacturing

SUMMARY

Four important trends are combining to shape the environment in which industrial park development occurs.

KEY TRENDS

- ***The jobless future:*** technology continues to make inroads into manufacturing, services, and even higher level brain work, as it did with agricultural work.



- ***The land usage mixing bowl:*** basic manufacturing offshored and America focused on value-added R&D projects, mitigating issues of incompatible land uses.

- ***The power equation:*** electric power, the key “raw material” for industrial developments, is a technology in growing demand both in generation and distribution.

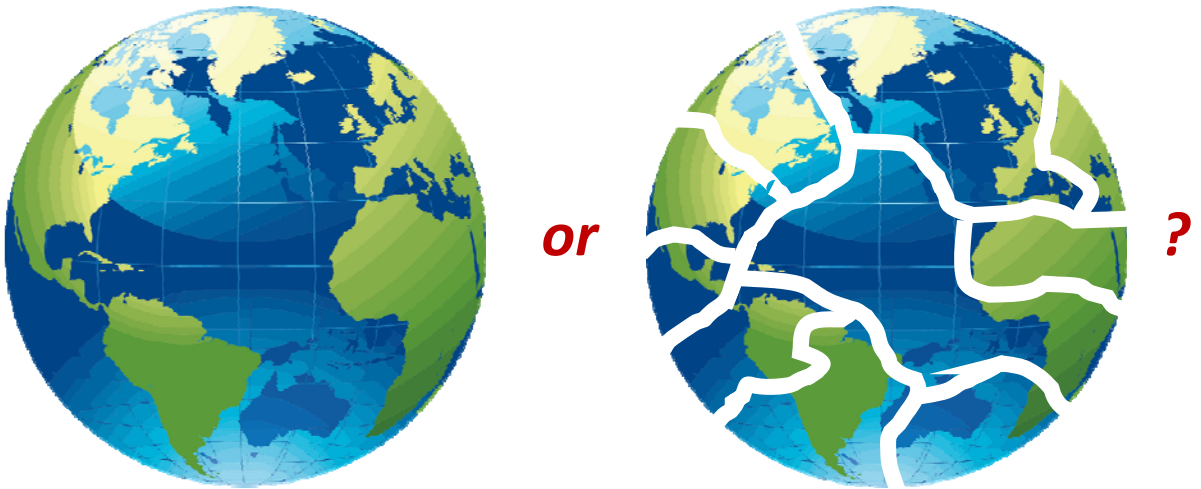


- ***Economic development:*** the competitive environment among states and localities to attract and retain job- and tax base-creating industry will remain fierce.

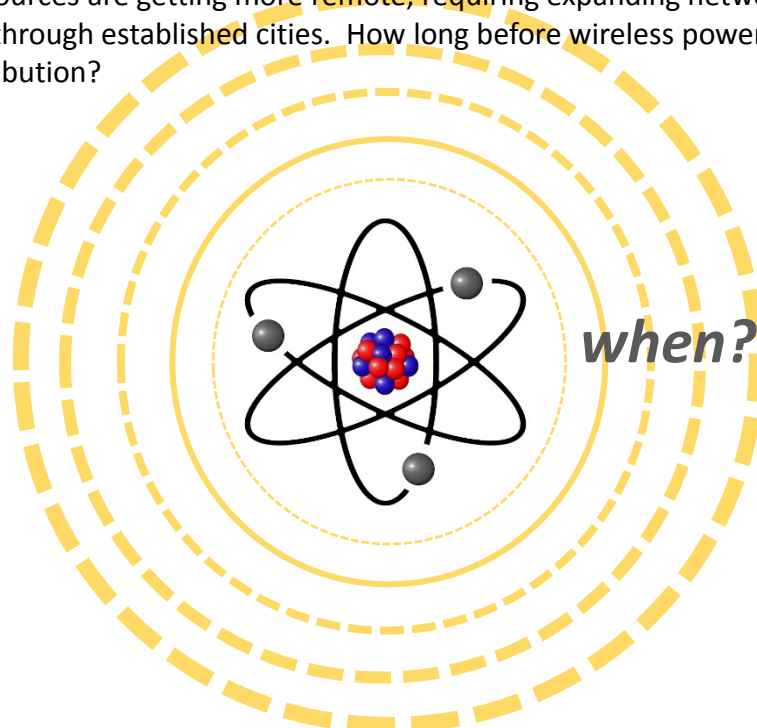
SUMMARY

KEY UNCERTAINTIES!

Globalism vs. Protectionism: The world is being buffeted by strong anti-globalist winds, and which side prevails will have large impacts on the types of manufacturing done in the U.S., thus on the facilities types incorporated in industrial parks.



Variables in the Power Equation: Power demand is exploding and generation sources are getting more remote, requiring expanding networks of distribution through established cities. How long before wireless power transforms electric distribution?



SUMMARY

Four distinct and plausible future scenarios emerge, each dependent on which factors from the uncertainties spectra combine:

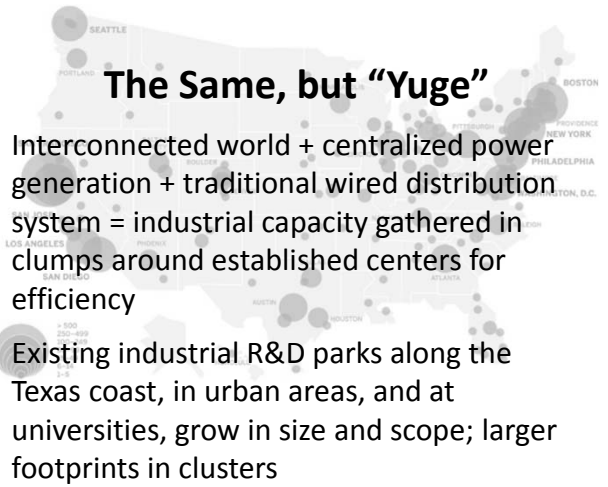
**Globalism
Triumphs**



Electric Blanket

Global economy + power remotely generated + wireless transmission = industry diffused across the planet, in places near and far

In Texas, industrial development forms a diffuse grid, spread across virgin areas. Industrial parks focus on research and product development and drag these functions along with them; smaller footprints widely scattered



The Same, but "Yuge"

Interconnected world + centralized power generation + traditional wired distribution system = industrial capacity gathered in clumps around established centers for efficiency

Existing industrial R&D parks along the Texas coast, in urban areas, and at universities, grow in size and scope; larger footprints in clusters

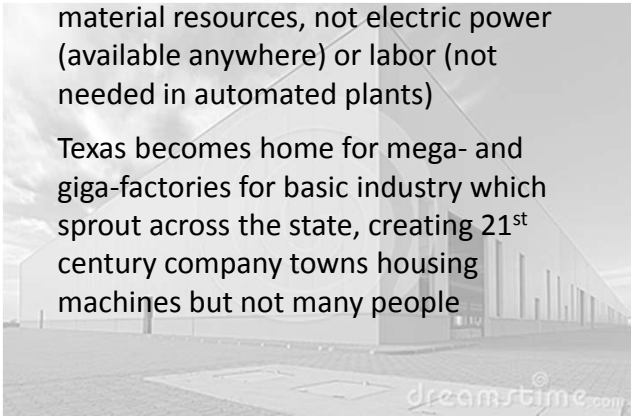
Global Economy

Electricity Anywhere, Anyhow

The Company Ghost Town

Basic manufacturing is back + heavy industry returns + both locate near material resources, not electric power (available anywhere) or labor (not needed in automated plants)

Texas becomes home for mega- and giga-factories for basic industry which sprout across the state, creating 21st century company towns housing machines but not many people

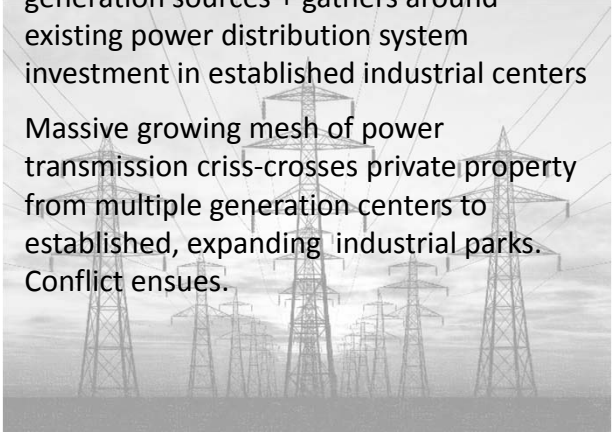


Power for Industry — Bound with Wires

An Army of Power (Lines)

Big manufacturing needs power from *all* generation sources + gathers around existing power distribution system investment in established industrial centers

Massive growing mesh of power transmission criss-crosses private property from multiple generation centers to established, expanding industrial parks. Conflict ensues.



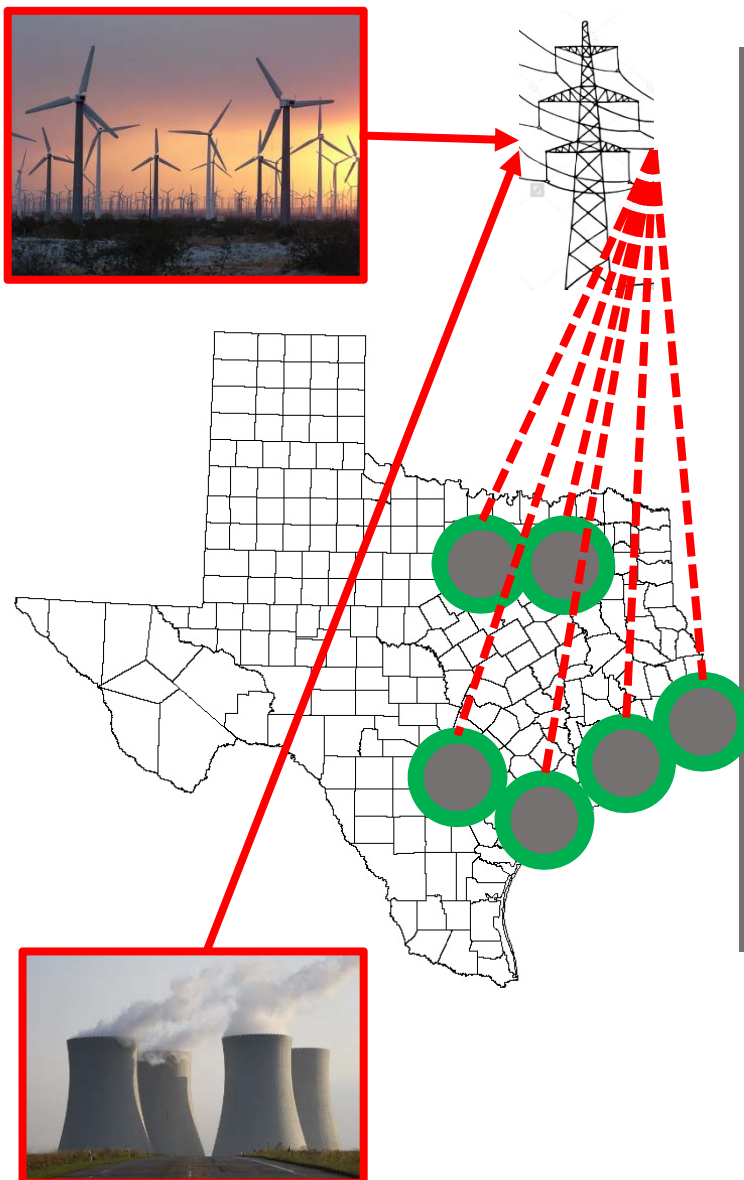
**Economic
Nationalism
Prevails**

SUMMARY

RECOMMENDATIONS

Two factors are most likely to shape the next decade and tilt the field of uncertainties:

- ***The jobless future:*** automation will reduce the emphasis on job out-migration. Economic protectionism will lose some steam and globalism, though tempered, will prevail.
- ***The dream of wireless power:*** despite its far-reaching disruptive potential, this technology will be just a dream for the next decade. Traditional distribution still rules.



Therefore, we recommend:

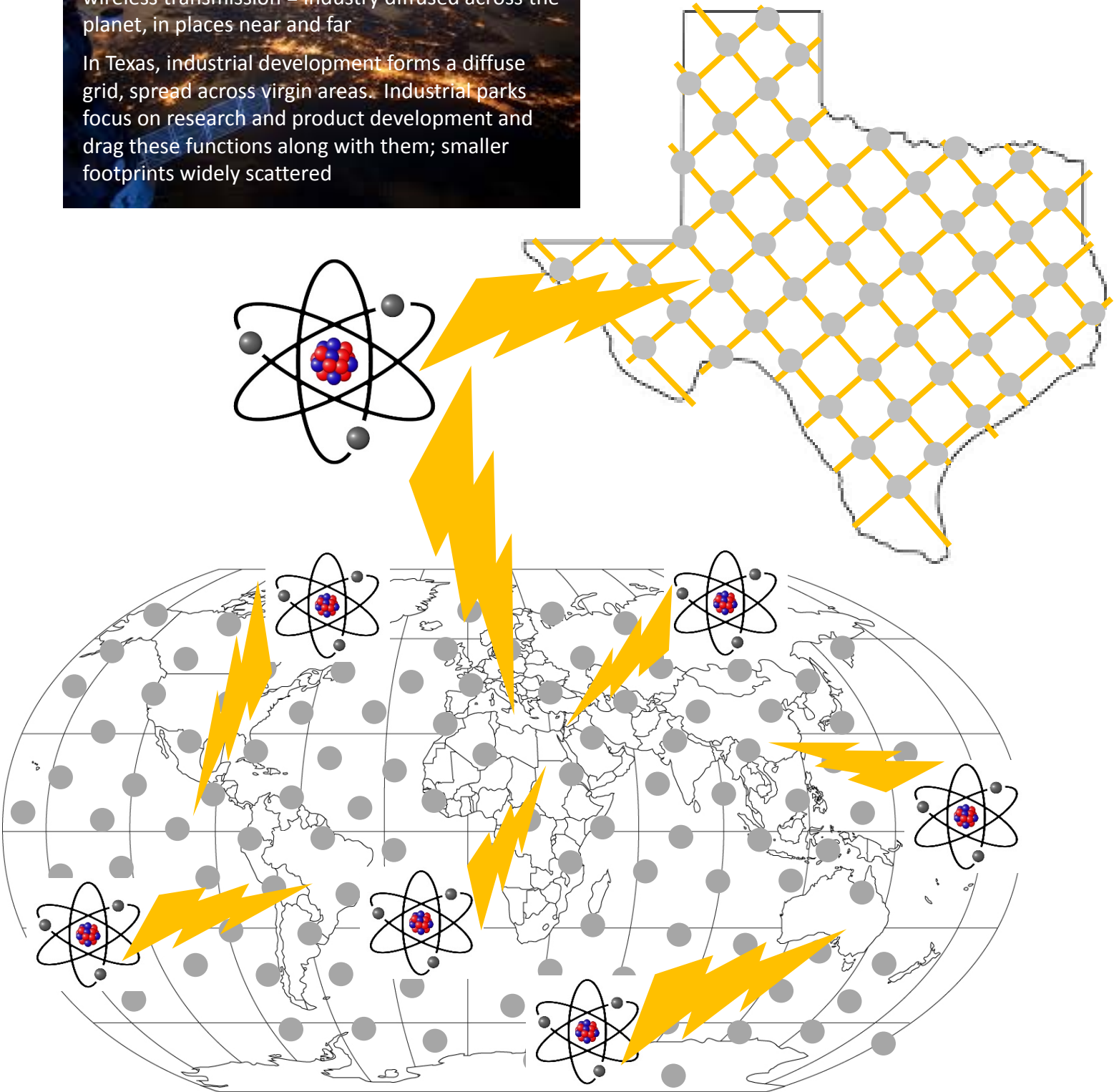
- Consolidate your holdings in areas with established electrical infrastructure already in place.
- Incorporate green amenities to enhance quality-of-life aspects in your developments and incorporate mixed-use features.
- Build partnerships with universities and other research entities who will attract value-added manufacturing and R&D.

SCENARIOS DESCRIPTIONS

Electric Blanket

Global economy + power remotely generated + wireless transmission = industry diffused across the planet, in places near and far

In Texas, industrial development forms a diffuse grid, spread across virgin areas. Industrial parks focus on research and product development and drag these functions along with them; smaller footprints widely scattered



SCENARIOS DESCRIPTIONS

Electric Blanket

Characteristics:

Globalism triumphs over economic nationalism. This accelerates the development of the world-wide system of specialized industrial areas, each performing a specific role in the global economy. In the United States, our position as the leader in research and product development is reinforced, but basic manufacturing continues to drift away to foreign lands.

Leaps in technology with respect to electric power loosen geographic constraints. Power is now generated remotely offshore, in space, or in desolate areas, and is transmitted wirelessly anywhere on the face of the globe.

Industry, once shackled to the availability of electricity, now diffuses across the planet, in places near and far.

How the Scenario Plays Out in Texas:

Industrial parks, with locational criteria dislodged from their once-primary infrastructure component (electric power), develop new guidelines. Additionally, industry in the U.S. continues narrowing to a place higher up the value chain, in product development in lieu of manufacturing.

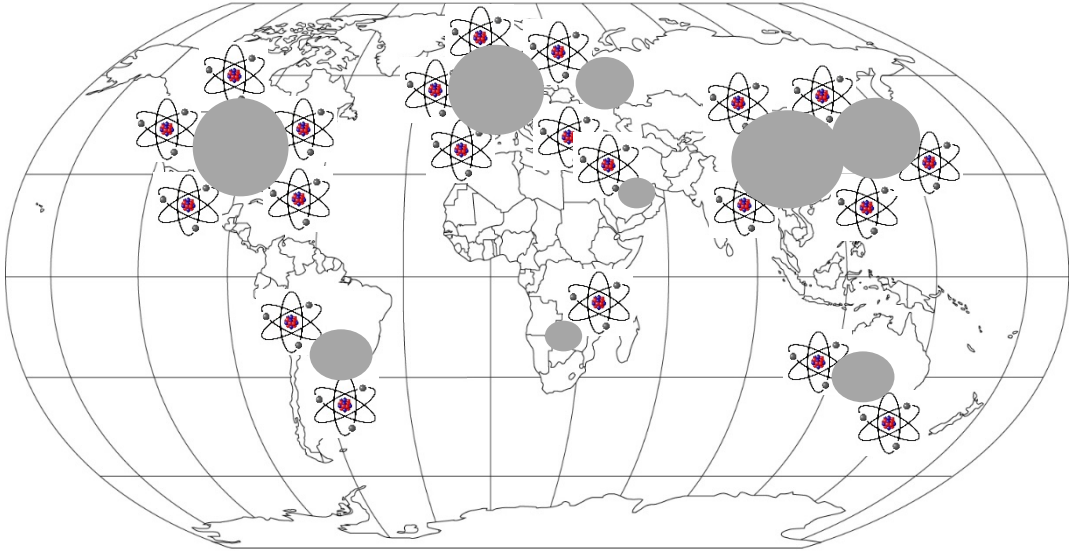
With concurrent developments that increase technology's input while reducing human input (reducing the need to be near population centers), and with a lessened need for location adjacent to major traffic arteries (R&D facilities move much less raw materials and finished product, and what they do move can be transported by driverless trucks), industrial parks scatter across the state in a low density "warm" grid (i.e., there are no significant "cold" voids in the geography of the industrial landscape).

SCENARIOS DESCRIPTIONS

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Interconnected world + expanded existing power generation + traditional wired distribution system = industrial capacity gathered in clumps around established centers for efficiency

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At the same time, the established electric power regulated monopolies blunt technological advances which would consolidate their energy sources for efficiency and make their distribution systems obsolete, choosing instead to expand existing infrastructure. Their investment is protected, but at a cost to the future.

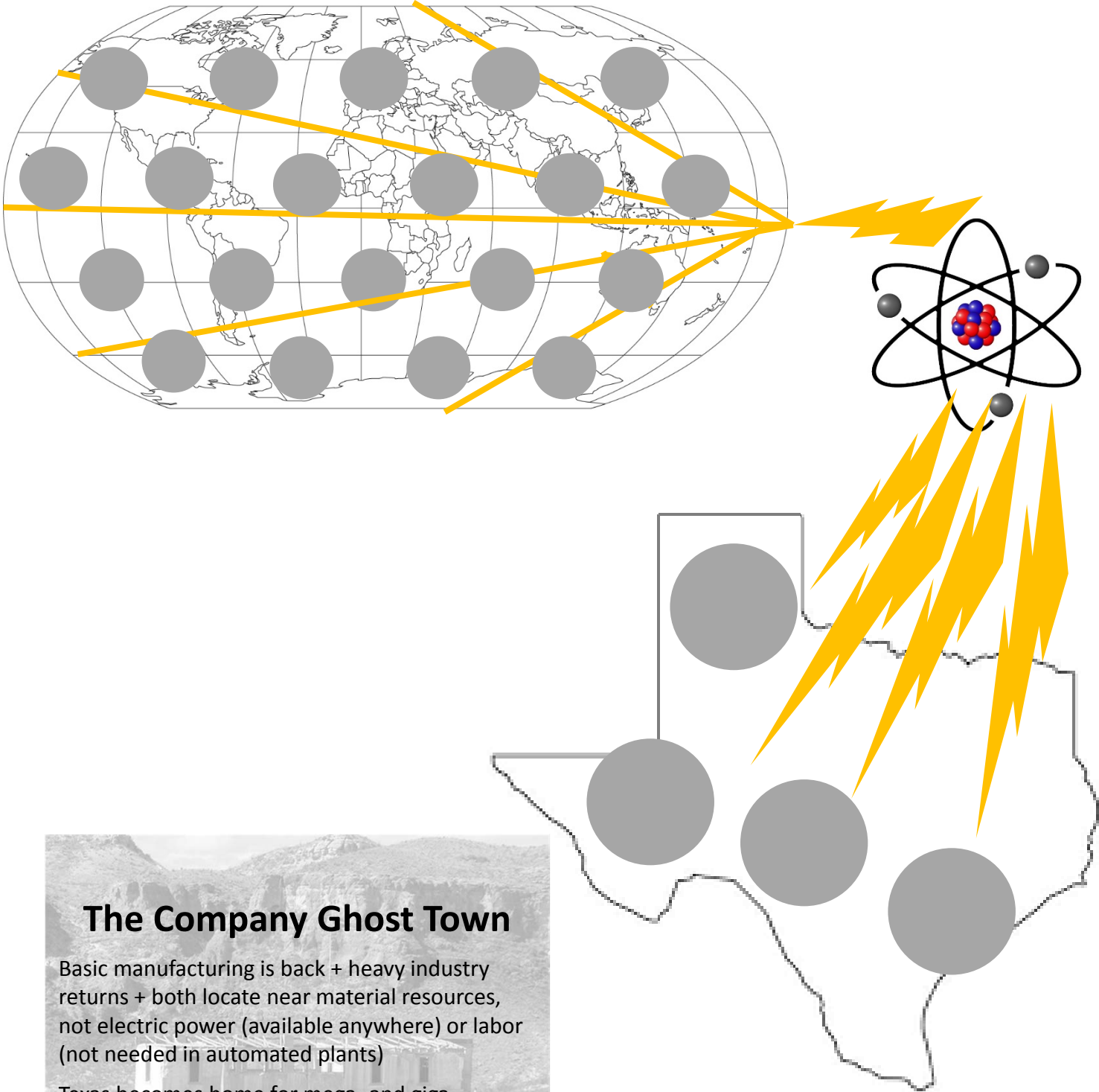
These qualities both push the world toward a renewed concentration of industrial facilities close to the source of their primary infrastructure need, electricity.

How the Scenario Plays Out in Texas:

Investment in existing industrial parks is reinforced, as the hurdle cost to build new power infrastructure is too high to allow new development except as integrated into the existing system. Thus, the desire for scale increases, concentrating development in existing industrial centers.

Major industrial centers along the Texas Gulf coast and in the major cities continue to attract investment and development, with increasing densities, traffic, and pollution. However, this is mitigated by the offsetting de-emphasis on any basic industry, which continues to quietly “offshore.” R&D-focused industrial parks, especially those co-located with universities in major metropolitan areas, prosper.

SCENARIOS DESCRIPTIONS



The Company Ghost Town

Basic manufacturing is back + heavy industry returns + both locate near material resources, not electric power (available anywhere) or labor (not needed in automated plants)

Texas becomes home for mega- and giga-factories for basic industry which sprout across the state, creating 21st century company towns housing machines but not many people

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Characteristics:

The United States withdraws from global trade partnerships, looking instead to protect existing basic manufacturing and foster new industry in a similar vein. The U.S. embarks on an economic development policy similar to that which had been engaged in by China and is now in favor in East Africa and other emerging trade blocs.

Leaps in technology with respect to electric power loosen geographic constraints. Power is now generated remotely offshore, in space, or in desolate areas, and is transmitted wirelessly anywhere on the face of the globe. Location in proximity to manufacturing raw materials takes precedence. And manufacturing technology does not require as many workers as had been hoped.

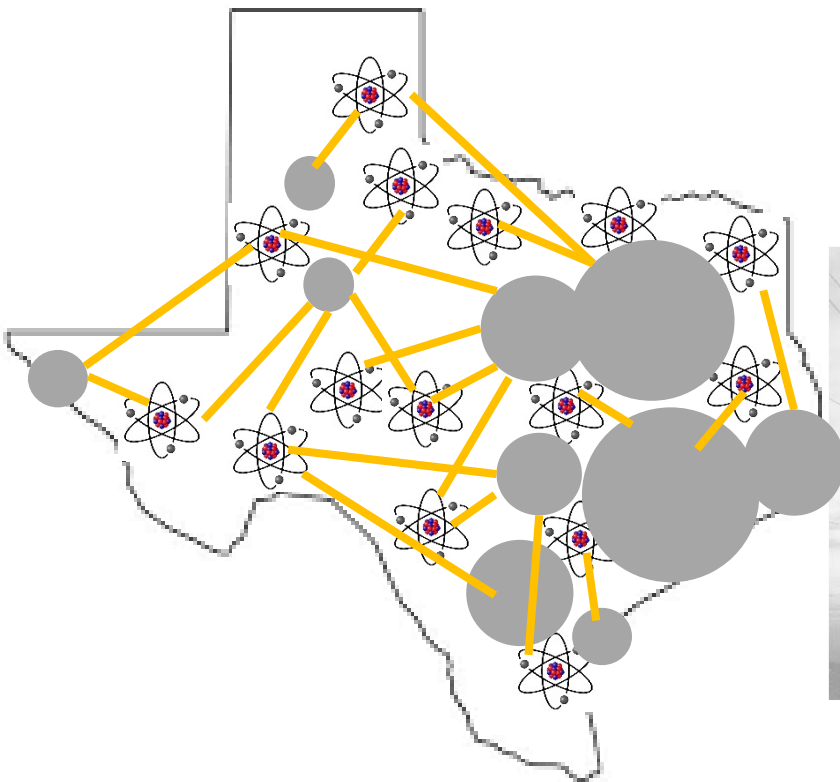
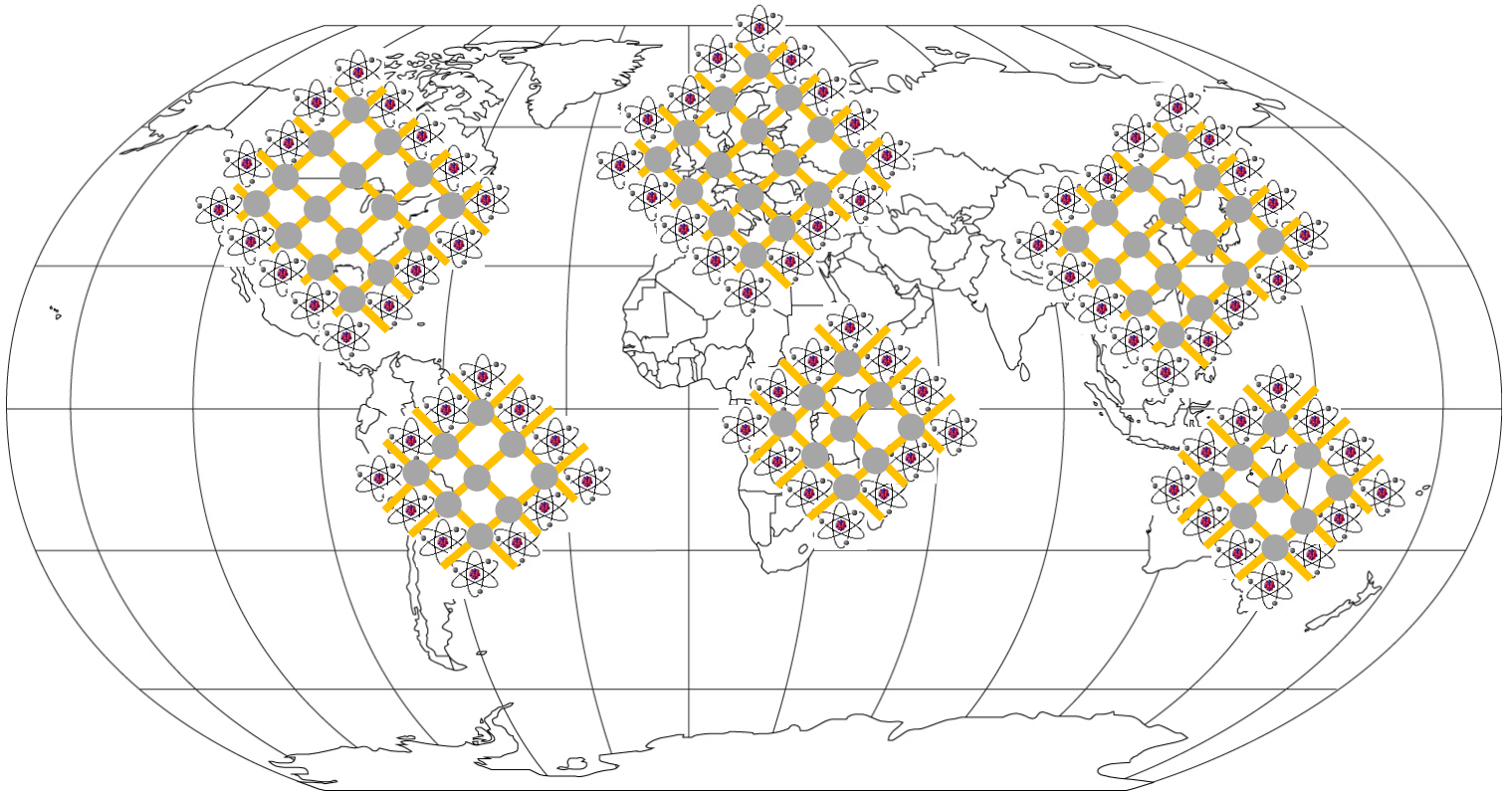
These qualities both push the nation toward a investment in industrial facilities which require scale and efficiency to be cost effective in the national market and (if product is pushed out) the world markets. These types of facilities are also difficult to locate close to dissimilar land usages, making mixed use, integrated development challenging.

How the Scenario Plays Out in Texas:

In spite of the nationwide economic difficulties such an industrial policy might impose, Texas is nevertheless positioned to benefit. With a large geographic area which can easily tap into the new power infrastructure, with many sources of manufacturing raw materials, and with cheap, abundant land, the state can attract large scale basic manufacturing facilities.

Industrial parks in this scenario will indeed need to be mixed use, but not by integrating into existing urban fabrics. Massive scale mega- and giga-factories will spring up, centered on the plant but incorporating the other necessities for the relatively few workers who will staff them. This will result in an array of such places spread across the state, massive investments in real estate, structures, and technologies, but with few people—they will be company ghost towns.

SCENARIOS DESCRIPTIONS



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At the same time, the established electric power regulated monopolies blunt technological advances which would decentralize their energy sources and obviate their distribution systems. Their investment is protected, but at a cost to the future.

These qualities both push the nation toward concentrations in both massively scaled manufacturing complexes, fed by power from existing utility infrastructure companies. In order to scale up effectively, power generation must increase, and industry must geographically concentrate in order to cost effectively access electric power.

How the Scenario Plays Out in Texas:

Again, Texas is positioned to benefit (relatively speaking) in spite of any economic hardships that protectionism might bring to the rest of the country. Demand for basic industrial space will continue unabated.

In order to meet the need for power, electricity must be transmitted to large industrial parks centralized around existing metropolitan areas. Power generation itself must come from every available resource—conventional fossil fuel, nuclear, and alternative. Since generation facilities are dispersed, this requires transmission from multiple locations through existing properties, in many cases already developed. Such infrastructure will thus have a large financial cost to develop, and may be expected to run into considerable opposition from property owners who will be affected, thereby further running up costs and inflaming the public. The aborted Trans Texas Corridor and the current Texas High Speed Rail project are harbingers.