The Emerging Open Market Customer

Market-Smart Consumers, New Suppliers, and New Products Will Combine to Shape the "New Energy Industry"

Clark Gellings, P.E., Vice President of Client Relations, EPRI
CEO epriCSG

Ken Gudger, Principal
Ken Gudger and Associates

Americans spend $780 billion annually on non-transportation energy—only a third of which comprises traditional energy utilities' revenue. Through a confluence of emerging technologies, growing consumer awareness, and a changing regulatory framework, we are witnessing the creation of the Open Market Customer. This article defines the Open Market Customer, considers how consumers and suppliers will interact, and suggests some of the dramatic results that could emerge as a result.

The U.S. economy depends upon a safe, reliable, and economical energy supply. Americans enjoy a system of energy production and distribution that is without peer. Energy costs in the U.S. are relatively low and stable, and energy supplies are reliable. The U.S. energy supply system works well. Yet we are setting out to "fix it" even though it appears at first glance that it "ain't broke."

This article focuses upon the emerging needs of the Open Market Customer, a creature born of deregulation, dynamic market forces, new technologies, and energy consumerism. What is the Open Market Customer?

How will this customer transform the way energy is produced, moved, used and paid for?

AN HISTORICAL PERSPECTIVE ON THE ELECTRIC ENERGY BUSINESS

The electric energy business was born a century ago in an era of proud individualism. It went through successive phases of development triggered first by a changing political and regulatory framework, and then by external shocks that profoundly altered its development. These periods can be thought of as growth periods.

1. **The first period** was the infant electric energy industry of 1880 to 1910. The nascent electric utility industry fostered technological competition—alternating current vs. direct current, ever-larger generators, various prime energy sources—and competition for market share. Entrepreneurs jousted to provide bundled generation, distribution and transmission services, all seeking a competitive advantage. Rapid growth created pressure for combining electric supply and demand companies into ever-larger enterprises. With the mergers came growing public concerns about potential abuses of market power.

2. **The second period** of development in the electric energy business lasted from 1910 to 1970. The beginning of the period was marked by a turn toward regulation as a means to control the perceived excesses of the electric utility industry. Populist sentiment sometimes resulted in electric utilities becoming a function of government.

   This period brought technological progress, consolidation, and extension of service to all but the most remote locales. The concepts of "obligation to serve" and "return on capital" became powerful incentives to maintain vertical integration and encourage consumption. Utilities went for years and even decades without raising rates. Utility stocks were considered safe for widows and orphans. Nuclear energy offered the promise of "energy too cheap to meter."

3. This happy period ended abruptly and a **third period** began in the early 1970s triggered by the OPEC oil embargoes and resultant worldwide "energy crisis." Compounding the shocks were the growing environmental criticisms of electricity production as the root of environmental evil. Nuclear power suffered the double blows of Three Mile Island and Chernobyl.

   Policy makers imposed heavier regulations. President Carter, with "the moral equivalent of war," helped create the Demand-Side Management and renewable energy industries. Air quality regulations mandated expensive emission controls. Safety enhancements drove up the cost of nuclear power plants. States embraced centralized planning under the rubric of Integrated Resource Planning.

4. By the early 1990s, there was growing impatience and frustration with the third period's reliance on regulation and centralized planning. This lead to the creation of the **fourth period**. This period envisions the energy industry as governed by market forces instead of regulation for pricing, resource planning and energy acquisition.

   With it comes greater opportunity for new and innovative service and product design. In the fourth period, the "obligation to serve" becomes the "privilege to serve." The fourth period refocuses the industry from societal impacts to markets and customers. Dynamic market-responsive cultures replace previous planning cultures.

   This new environment, "Open Market Customer Energy Industry," contains "Open Market Energy Consumers" and "Energy Entrepreneurs." The latter encompass *all suppliers* in the energy marketplace. They are *entrepreneurs* because, whether small or large, startup or established industry leader, they must *behave* as nimble, aggressive companies if they are to prosper in this newly competitive arena. These buyers and sellers will reinforce each other's goals, purposes, and initiatives to create the fourth period, one that will be very different from its predecessors.

DEFINING "OPEN MARKET CUSTOMER" AND THE INDUSTRY WHICH SERVES THEM

Our analysis reveals that the energy functions undertaken by traditional energy utilities represents only *one third* of the total marketplace.

The Open Market Customer Energy Industry encompasses all energy users and all organizations with whom energy users must interface, directly or indirectly, to obtain desired energy services. These include providers of:

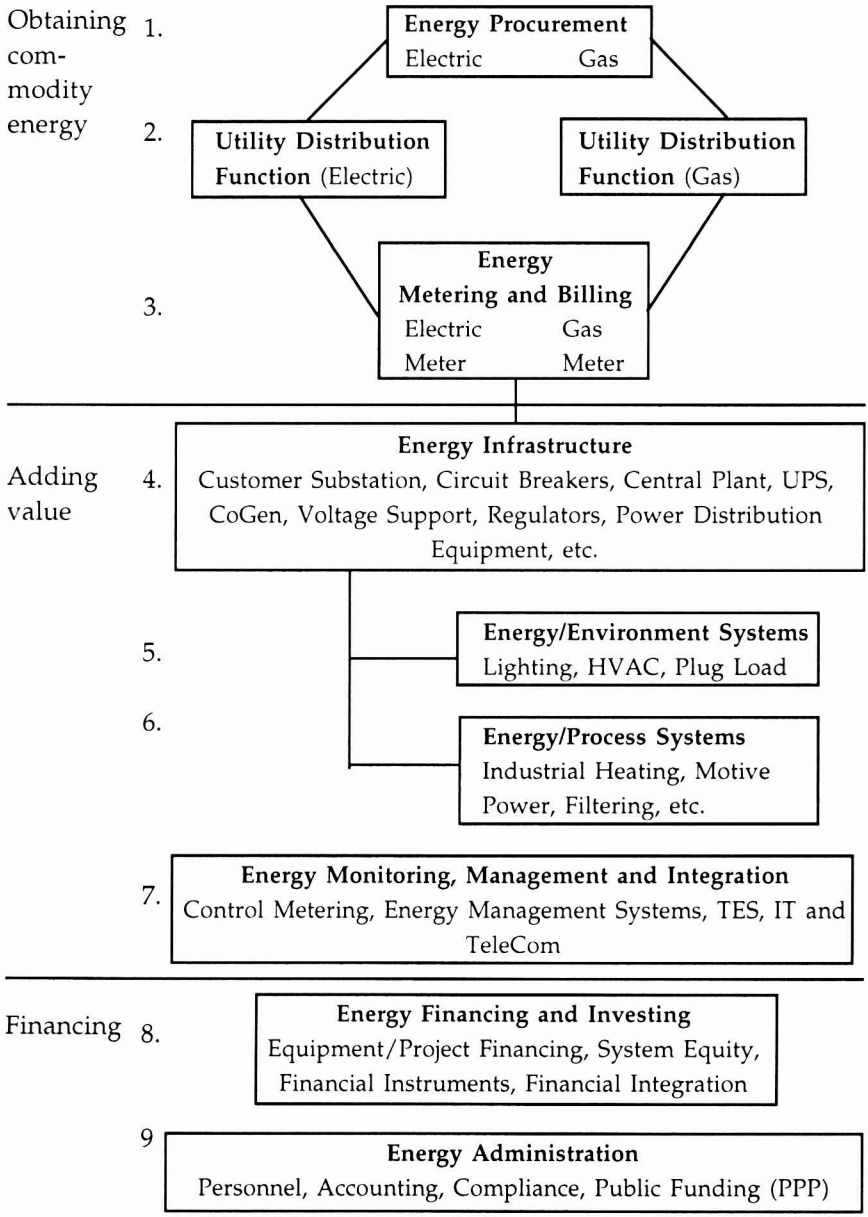
- electricity, natural gas and related raw energies to residential,commercial and industrial energy users;
- equipment, technology, products, services and systems needed to convert energy;
- design, construction, operation, maintenance and finance of such products and systems;
- knowledge and information to the energy marketplace;
- regulations at the federal, state and local levels.

Figure 1 shows this new marketplace as nine individual business functions or market segments. One can think of the Open Market Customer Energy Industry as having three basic parts:

- **Obtaining Commodity Energy:** Having inexpensive and reliable raw energy (primarily electricity and natural gas) delivered to industry, office or home (Market Segments 1-3).
- **Adding Value:** Buying, installing, operating and maintaining all the necessary apparatus to control the energy and convert it to the services desired (Market Segments 4-7).
- **Financing:** Financing and administrating the energy infrastructure and equipment in the Value Added Category (Market Segments 8-9).

Table 1 shows a surprising insight about the Open Market Customer Industry. Commodity energy is only a third of the total energy marketplace. Value-added services and financing is fully two thirds of the total market. Equally significantly, the American energy consumer has sunk huge capital investments in energy infrastructure and energy-

The Open Market Customer Energy Industry



From: C.W. Gellings, "Effective Power Marketing," pending publication, 1998, PennWell Publishing Company.

Figure 1

using equipment.

While the first three line items in Table 1 are reasonable estimates, lines 4-9 are less precise. Lines 4-9 are indicative of orders of magnitude rather than as precise measurements. Nevertheless, they reveal important aspects of the total Open Market Customer Energy Industry.

Table 1

Business Function	Annual Expense ($ Millions)	Total Investment ($ Millions)	Expense % of Total
1. Energy Procurement	110,000	—	14%
2. Utility Distribution Company	1 55, 000	—	20%
3. Energy Metering and Billing	5,000	—	1%
4. Energy Infrastructure	130,000	1,750,000	17%
5. Energy/Environment Systems	100,000	350,000	13%
6. Energy/Process Systems	25,000	100,000	3%
7. Energy Monitoring/ Mgmnt/Integration	5,000	25,000	1%
8. Energy Financing and Investing	225,000	—	29%
9. Energy Administration	25,000	25,000	4%
TOTAL	$780,000	$2,250,000	

From: C.W. Gellings, "Effective Power Marketing," pending publication, 1998, PennWell Publishing Company.

CUSTOMER CONSIDERATIONS IN THE OPEN MARKETPLACE

The Open Market Customer Energy Industry comprises a myriad of companies from small niche players to global giants with multiple products and services. Each market segment has its own inputs and outputs, and its own definition of success. Companies will succeed to the extent that they deal effectively with perceived and actual customer

needs. However, customers in an emerging market don't know what they need until they are shown it.

Today's energy customer is largely indifferent to the existing energy marketplace because he has few options. Other industries show that as new products and services emerge, they create new demand and revenue streams. Before the breakup of AT&T, who would have thought about voice mail on residential phones? Or call waiting, forwarding, screening, speed calling, repeat dialing, priority ringing? People spend more on communications services than ever before *because they are buying new and different services* that they never thought about until the services became available.

As the Open Market Customer Energy Industry becomes more mature, consumer choices will expand exponentially. Residential consumers are likely to remain indifferent to their energy options, if the telecommunications experience is any indicator. Larger commercial and industrial users, especially those for whom energy is a large part of their variable costs, will pay much more attention, just as they do today. Whether consumers simply throw up their hands in disgust or become active participants will depend significantly upon the ability of marketplace participants to communicate the benefits of particular services and products.

Consider the range of issues confronting the Open Market Customer Energy Industry:

- **Energy Purchase:** Price. Marketer reliability. Contract terms.

- **Energy Delivery:** Utility Distribution Company reliability and responsiveness in times of emergency. Technical interface between user's system and the Distribution Company.

- **Metering:** Accuracy. Timeliness of reading. Information value of reports and bills.

- **On-site Energy Control and Distribution:** Maintenance. Emergency generation capabilities. Fuel flexibility. Infrastructure system renewal plans. Power quality.

- **Energy Transformation:** Lighting, heating and cooling systems adequacy, efficiency, and cost effectiveness. Maintenance needs and plans.

- **Industrial Process Use:** Technologies to improve productivity, product quality and environmental regulation compliance.

- **Monitoring and Measurement:** Data adequacy, appropriateness and value. Invest vs. buy tradeoffs. Efficiency enhancement vs. infrastructure expansion trade-offs. New vs. old energy technology trade-offs. Telecommunication and computer technology integration with energy systems.

- **Financing and Investing:** Energy cost hedging options. Lease vs. own. In-house vs. outsourcing. Finance vs. invest. Capitalization vs. expensing. Financial services bundling. Shared savings vs. performance contracts.

- **Administration and Overhead:** Personnel competency and training. Staff size. Accounts receivable and payable management. Regulatory compliance awareness. Incentive program awareness. Energy options awareness.

CUSTOMER EXPECTATIONS: DEMAND-PULL *AND* SUPPLY-PUSH

Most customers care about energy service only when it disappears (a power interruption) or when they have to pay for it (when they receive their energy bill). Only large commercial and industrial energy users, or sophisticated small business users, are actively involved in one or more of the Open Market Customer issues.

However customers' awareness and attitude can change quickly. With the deregulation of other industries, consumers have quickly become knowledgeable and discriminating of the goods and services. From the telecommunication industry to the airline industry, customers have proven to be responsive to technology innovation and marketing programs.

What will be the winning products and service in the emerging Open Market Customer Energy Industry?

TEN IDEAS ABOUT THE FUTURE

We don't know. If we did, we wouldn't be telling you about them, we'd be investing in them. While forecasting is filled with trepidation, we have ventured some predictions about the fourth energy period:

- **Technologies that convert energy to services will go through a resurgence of research, development and successful commercialization.** Energy/Environmental systems and Energy/Process systems have historically enjoyed a high growth rate of development and implementation. Lower energy prices will significantly improve the cost-effectiveness of many energy process technologies compared with non-energy industrial processes (mechanical, chemical, etc.). As sales of these technologies increase, State and Federal regulators may be more inclined to mandate technologies for environmental improvements—further reducing equipment prices.

  Energy efficient lighting and heating/ventilating/air-conditioning (HVAC) technologies have benefited from utility rebates. While rebates will be drastically reduced, other forces will foster new development such as: (1) a renewed energy services industry by the retail affiliates of energy companies; (2) the "public purpose programs" that are developing in more states as regulators cling to the efficiency ethic; and (3) continued Federal and State interest in appliance and building standards.

- **The *quality* of energy could become a significant price and service differentiator.** Some electric utilities were surprised by the robust customer response to interruptible tariff offerings. At the same time, other customers were paying for facilities to assure uninterruptible service. This demonstrates potential demand for a wide variety of "power quality" and a ready market for interruptible power, firm power, standby generation, cogeneration, Uninterruptible Power Systems, Clean Power technologies, and similar offerings.

  The business segments of Energy Procurement, Utility Distribution, Energy Infrastructure and Energy System Integration could all foster power quality services. Integration of these options could well become a significant service in the Open Market Customer Energy Industry.

- **The Open Energy Marketplace will unite with the information management and telecommunications industries to produce dynamic, new products and services.** One of the more exciting opportunities in the Open Market Customer Energy Industry will be in

the Monitoring, Management and Integration Businesses Area. Data management, computer control systems, and telecommunication medium (microwave, fiber optic, power line modulation, etc.) systems will provide almost unlimited opportunities in residential, commercial and industrial marketplaces alike.

Customers' multi-site locations across the U.S. will have instant monitoring, management, and integration capabilities that will allow them cost and service enhancements unfathomable now. Residential appliances could transmit data through house wiring to smart meters and then over the Internet, providing information on appliance usage and maintenance and replacement opportunities.

Knowing when and for how long refrigerator doors are open could suggest food use patterns and help supermarkets target market. Such information would have more value to equipment manufactures, distributors, and marketers than it would to the customer who used the energy!

- **The Energy Metering Business Area will experience dynamic growth and renewal.** One of the most important and growing business areas will be the energy metering function. The right to provide this primary interface between the upstream commodity supply and downstream energy services is heavily contested in industry restructuring. Not only has hourly pricing created a demand to replace millions of meters, the aggregation of multi-site customers, electronic billing, and smart meters that choose the best supply options will spawn many more advances in technology. It seems that the days are numbered when the American home will continue to have separate meters for electricity, gas and water.

- **Customers will devote greater attention to the management of their energy infrastructure.** Like metering, this business area lies at a critical juncture in the integration of all energy and energy service solutions. Sound management practices will give large energy users greater flexibility to operate upstream (energy procurement) and downstream (energy conversion.) On-site generation will grow because of:

  — customers requiring on-site reliability;
  — customers wanting to sell into the energy market; and

— efficient small generation systems and new technologies, (e.g., fuel cells).

The Open Market Customer Energy Industry participants, especially those with utility backgrounds, will have opportunities to provide outsourcing services for design, construction, operations and management of customer-owned energy infrastructure.

- **Suppliers will use innovative marketing strategies to sell into the Open Energy Marketplace.** The Open Market Customer will be the beneficiary (or victim) of some of the same innovative marketing strategies used by other deregulated industries, particularly in residential and small commercial and industrial markets where mass marketing prevails. Customers will be able to choose a wide variety of energy marketing options *(e.g., "a* free airline mile for each kWh used"). These marketing strategies will be combined with new technologies to create a "first on the block" syndrome. For example: a recent nationwide survey by EPRI showed that 56% of residential consumers have or want to know more about home security, 52% want to know more about on-line energy management, and 46% want information about whole-house surge protection.

- **More Energy Consumers will take advantage of energy and energy service outsourcing.** Customers will be presented with a greater variety of choices and that will produce customer frustration from lack of familiarity with energy and energy service issues. Except for the largest players, customers may not want to take the time to fully comprehend various options and will require expert assistance. Residential and small commercial and small industrial businesses will be more inclined to look at outsourcing the energy and energy services function (mostly likely through affinity groups). This will lead to significant bidding and selection of energy partners with groups of small customers.

- **A plethora of financial offerings will creatively respond to financial and investment challenges.** The amount of funds expended and invested by the Open Market Customer will be an incentive for the financial services business to develop new financial offerings. These will be designed to attract residential and small commercial

and industrial energy customers. Creative financing could involve packaging both energy procurement expenses with energy equipment capitalization. Financial arrangements could also involve new forms of packaged energy and energy service such as end-use metering.

- **Mergers, partnerships and collaboratives of various product, service, and information companies and organizations will become commonplace throughout the industry.** Many "natural" industry mergers are already beginning: Electric/Gas Utility with Electric/Gas Utility; Utility with Power Marketer; and Utility with ESCO. Over time this list will extend throughout the industry. Rather than focusing on mergers of old utilities, a new series of partnerships will include equipment manufactures, energy suppliers, financial service businesses, infrastructure engineering and construction companies, and system integrators. Project-specific, customer-specific and technology-specific collaborations will become commonplace. These partnerships may extend to other industries that have synergistic advantages such as water, wastewater and telecommunications.

- **Opening the upstream (commodity end) to the Open Market Customer will open the downstream (value added) end of the marketplace.** After energy customers exercise choice in energy procurement, their remaining decisions will involve energy use. As costs on the front end come down, costs on the back end proportionally will be more significant. A host of agents will emerge to educate users about methods to control energy consumption. Potential profits will spur product offerings for design, construction, operations, maintenance and financing services for downstream equipment systems.

CONCLUSION: THE RATIONALE FOR AN OPEN ENERGY MARKETPLACE

U.S. economic success depends upon a reliable, flexible and low-cost energy supply. Although U.S. energy prices are relatively low and stable, and our electricity supply reliability is the world's best, we cannot

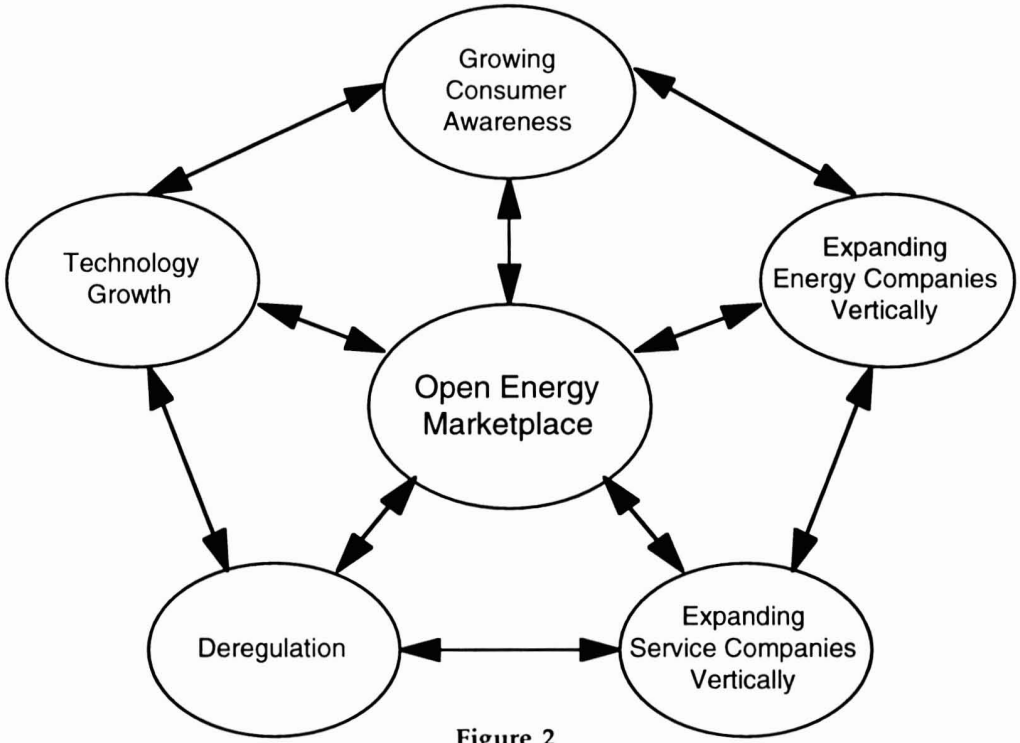


Figure 2

From: C.W. Gellings, "Effective Power Marketing," pending publication, 1998, PennWell Publishing Company.

stand still. Global competitors constantly challenge U.S. businesses.

We find that interactive forces are pushing our traditional energy and energy-related industries into a new competitive arena for the Open Market Customer:

- Regulatory change toward open markets and competitive forces. Growing consumer awareness and sophistication, often demanding customer choice.

- Energy utilities expanding into demand-side businesses, since growth is no longer obtainable through a regulated monopoly structure.

- Non-energy companies expanding into supply-side ventures, often using new technologies and non-traditional financial structures.

- Rapid convergence of energy, telecommunications and information technologies.

The relationships between these five drivers are complex and interactive. Figure 2 suggests the paths of feedback that can occur. The relationships between players is highly dynamic and volatile.

While suggesting the direction in which this new marketplace may develop, we think it is likely to unfold quite unlike even the most radical scenarios described today. By shedding light on the Open Market Customer and the relationships of the components, we hope to help prepare the new players for this uncertain—but certainly exciting—fourth energy period.

ABOUT THE AUTHORS

Clark W. Gellings, P.E., is vice president of client relations, and president/CEO of epriCSG of the Electric Power Research Institute (EPRI) in Palo Alto, California.

He joined the Institute in 1982 as a program manager and subsequently served as a senior program manager and as a director. Between 1992 and 1997, he served as vice president of customer systems before assuming his current position. Prior to joining EPRI, Mr. Gellings spent 14 years with Public Service Electric and Gas Company.

Mr. Gellings is a registered professional engineer, a fellow in the Institute of Electrical and Electronics Engineers (IEEE), a fellow in the Illuminating Engineering Society (IES), a vice president of the U.S. National Committee of CIGRE, and is active in a number of other organizations. He has degrees in electrical engineering, mechanical engineering, and management science.

Mr. Clark Gellings, P.E.
Vice President of Client Relations, EPRI
& CEO epriCSG
Electric Power Research Institute
3412 Hillview Avenue, P.O. Box 10412
Palo Alto, CA 94303
650-855-2000

Kenneth R. Gudger has extensive experience in all phases of the electric power industry. For over 15 years he held numerous senior management positions at Southern California Edison Company in transmission, substations, distribution, customer services and energy efficiency and marketing.

In 1991 Mr. Gudger assumed executive leadership of Southern California Edison's energy efficiency program. While he served as vice president of energy efficiency his organization developed a reputation as a nationwide leader in the US, receiving special recognition from energy customers, Washington, DC, and various special interests groups such as the National Resources Defense Council.

He was also instrumental in developing Edison International's newest subsidiary—Edison Source. This new company is specifically designed to meet the energy and energy services needs of large commercial and industrial North American energy consumers.

After leaving Edison in 1996 he has provided advice and consulting services to those involved in the new and emerging unregulated American Electric Energy Industry.

Mr. Ken Gudger
725 West Hillcrest Boulevard
Monrovia, CA 91016
626-357-2127
FAX 930-0737