

# Valve Market Forecasts

- Valve purchases in 2019 will be \$64 billion
- Replacement valves and repairs will exceed \$50 billion
- Purchases of valves by companies who are already purchasing valves will be \$60 billion
- This \$60 billion market is predictable and the unit forecasts for each purchaser are obtainable.
- Forecasts for each purchaser can cost effectively replace sales leads as the foundation of a market program.
- A change in marketing policies can be slowly implemented.
- A progressive program starts with the low hanging fruit
- [N028 Industrial Valves: World Market](#) forecasts corporate purchases for the top 200 companies representing 30% of the market.
- Forecasts for each purchaser can be provided in excel format for uploading to the CRM system.

## Start with a Program for Unit Forecasts for a \$36 billion market

Unit forecasts can be immediately identified for purchasers who will buy 56% of the valves in 2019.

A program which starts with these targets can then be expanded to forecast revenues for

- Smaller prospects
- Unique valve types

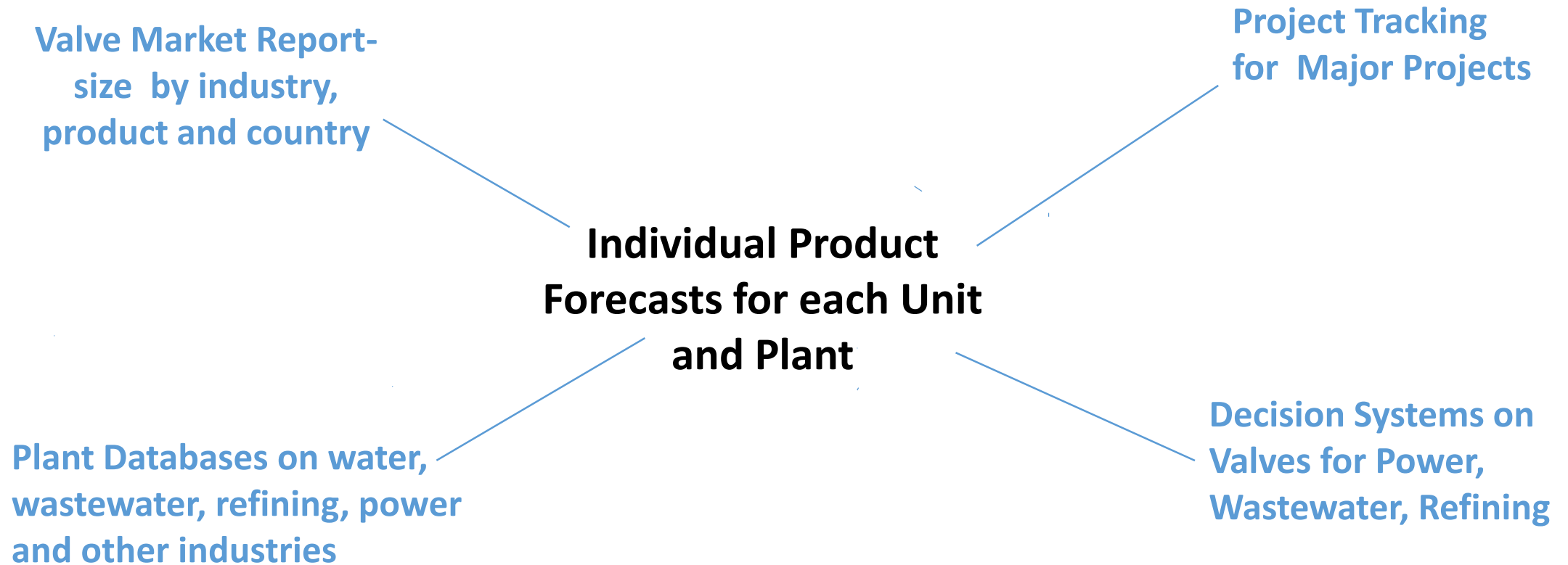
### World Valve Revenues and % which is Immediately Identified in Unit Forecasts

Industry	2019	%	\$ million
Total	64,520	56	36050
Chemical	7,600	50	3800
Electronics	520	70	364
Food	1,700	40	680
Iron & Steel	2,300	40	920
Metals	1,070.	45	482
Mining	1,440	60	864
Oil & Gas	9,870	70	6909
Other Electronics	570	20	114
Other Industries	7,500	20	1500
Pharmaceutical	1,700	60	1020
Power	8,700	80	6950
Pulp & Paper	3,050	70	2135
Refining	8,790	80	7032
Wastewater	4,720	40	1888
Water	4,640	30	1392





**Most valves are purchased as replacements. So forecasts of purchases at each unit and plant are more useful than sales leads. Forecasts guide the representatives and make the whole program more cost effective than reliance on sales leads.**

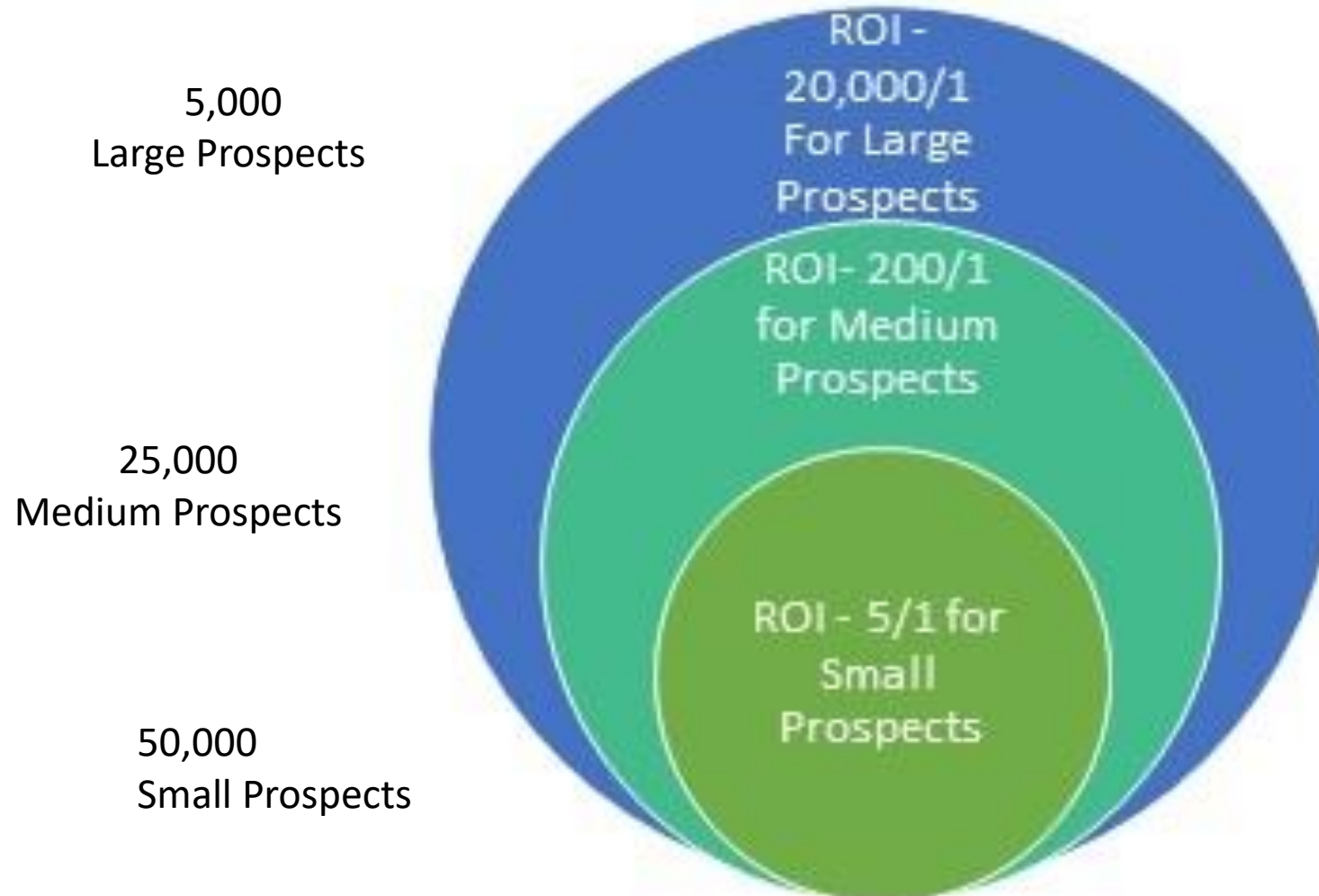


**McIlvaine has a number of services which provide the technical and market insights needed to make accurate forecasts of individual plant purchases.**



The Total Available Market (TAM) forecasts for valves at each of 80,000 plants can be purchased at a cost which will make the investment (ROI) very attractive.

The average ROI will be 200 to 1. This is based on a yearly opportunity of \$200,000 an increase in market share of 0.5% and a profit margin of 10%.



With a progressive program you start with the large and work down to the small prospects.

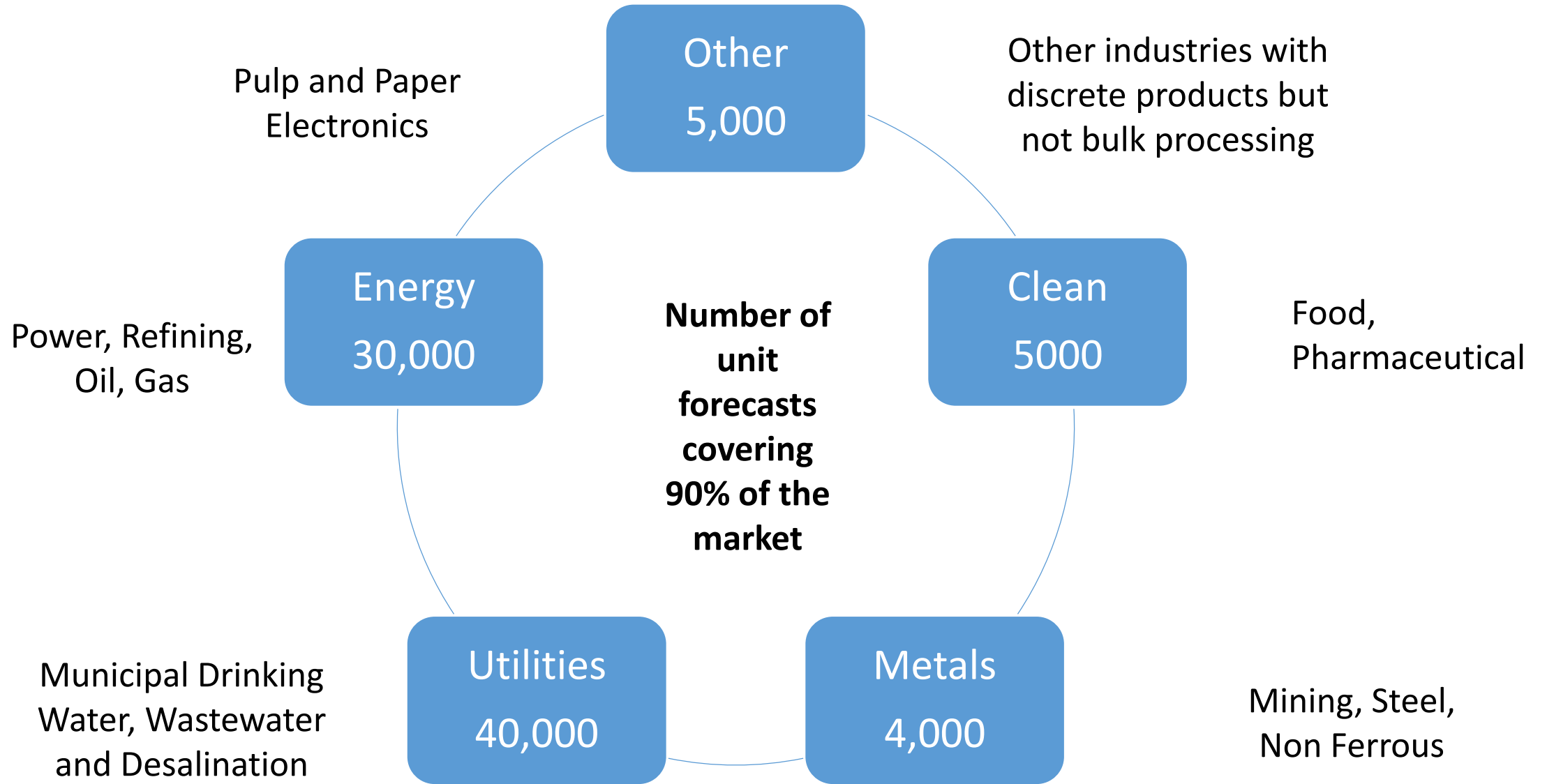
A 5-1 ROI is attractive compared to sales leads and improves in subsequent years when the cost is reduced.



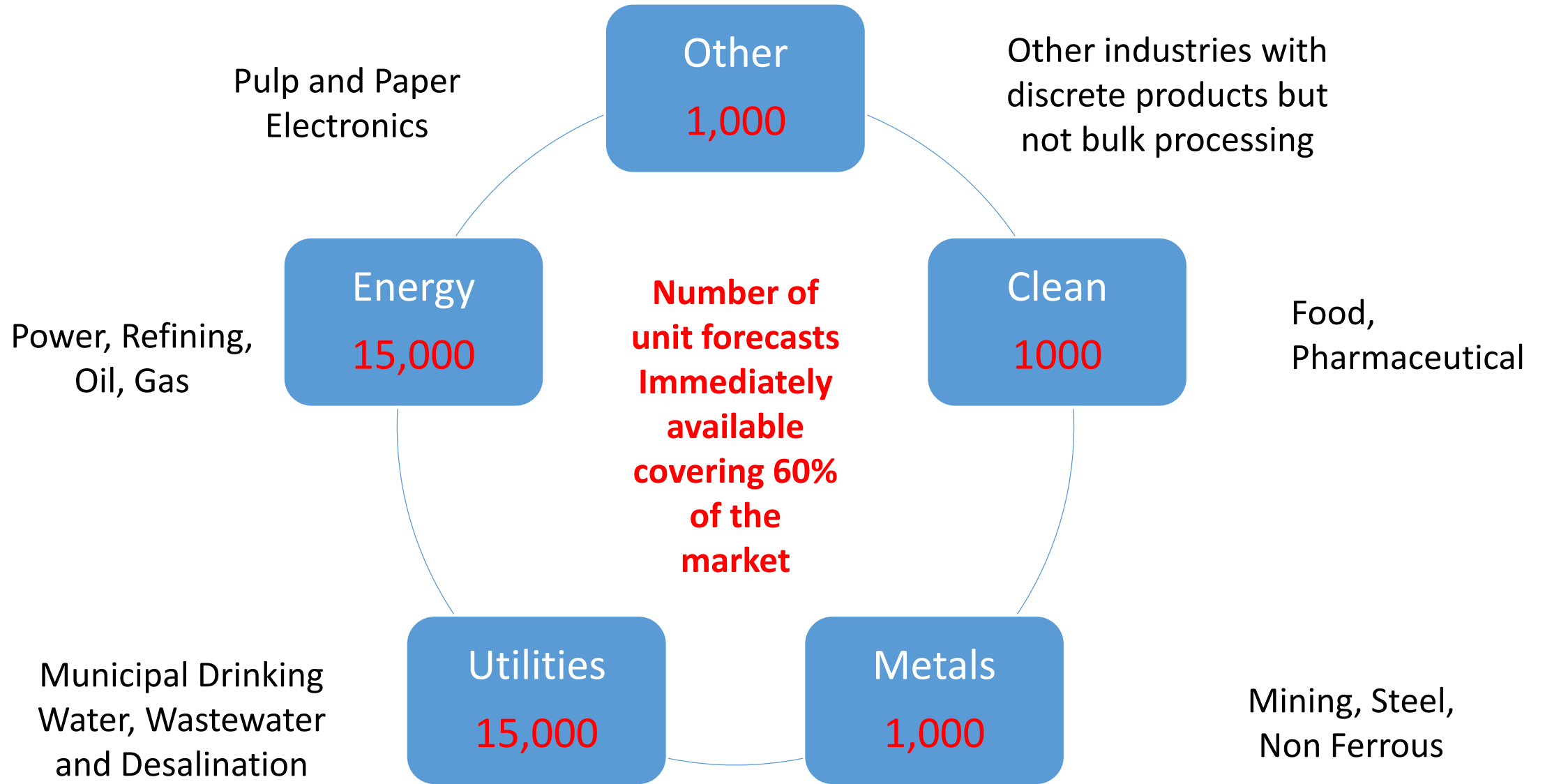
# Progressive Program

- Forecasts for the large power, refining, pulp, mining, semiconductor, municipal water, wastewater plants are easily calculated because the processes are nearly identical from one plant to another.
- Processes at chemical, pharmaceutical, and food plants vary and require additional analyses.
- A program can be initiated to start with the large customers and easily calculated forecasts.
- Forecasts for the more complex and smaller customers can be integrated later.
- Ultimately custom forecasts for specific valve designs and for smaller plants can be integrated.

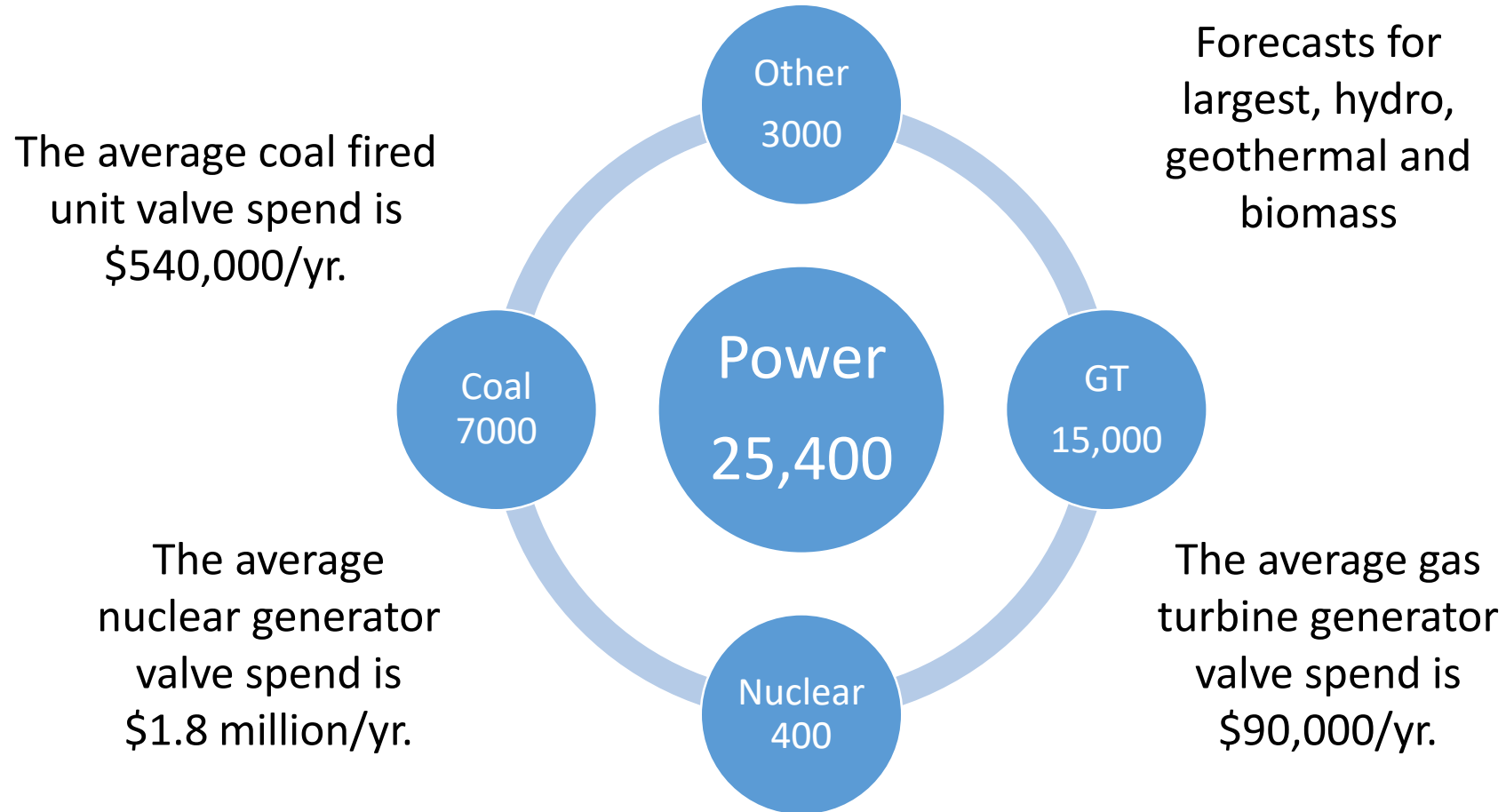








# Valve Forecasts for 25,400 Power Generators



# Valves at AEP

- AEP is operating 17,000 MW of supercritical coal fired boilers in the U.S. and is spending \$30 million per year on valves.
- The John W Turk unit is a 600 MW ultrasupercritical boiler which went into operation in 2012 with SCR, pulse jet baghouses and dry FGD and is burning low sulfur coal.
- The yearly expenditure for valves for this plant is \$900,000.
- Other AEP plants have wet scrubbing systems and spend more on valves.
- AEP operates 38,000 MW of generating capacity in the U.S. and spends \$40 million per year for valves

# EVN Valve Purchases

- EVN Genco 3. Viinh Tan 2 site - a total of 1330 MW of coal fired capacity with precipitators, SCR and seawater scrubbing.
- Designed by Shanghai Electric with two sets of turbines and erected in 2013. The seawater scrubbing contract was awarded to Alstom in 2011 for both 660 MW units.
- Alstom selected valves, pumps and other components as part of its proprietary seawater scrubber system design.
- In the example we provide forecasts for five types of valves but included both control and on/off. There are eight valve categories each further segmented into control and on/off.
- The 2019 forecast for total valves for the unit is \$930,000. The valve forecast for the plant is \$1.86 million.
- Forecasts can also be provided for all the EVN plants. EVN operates 26,000 MW of coal fired, hydro and gas fired plants. Valve purchases will be \$39 million/yr. for all these plants in 2019.

# Valve Purchases at EVN

Corporate Name: EVN	Unit size: MW 660
Plant Name: Genco 3 Vinh Tan 2	Vĩnh Tân commune, Tuy Phong district, Bình Thuận province. Vietnam
Unit # 1	Specific product purchases 2019 \$1000
<p>Forecasts can be supplied for sixteen types of valves, four types of pumps, actuators, limestone, lime, precipitator internals, dust bags, gas instrumentation, liquid instrumentation, controls, treatment chemicals, ammonia, urea, catalyst, cartridges, dewatering filter belts, membrane modules, linings, nozzles, mist eliminators, fans, air compressors, oxidation compressors, motors, VFD, seals, packing, hose, couplings, compressed air filters, lubrication filters</p> <p>Since McIlvaine is gathering details on the processes such as FGD and SCR at each plant it can forecast valve purchases for each of the processes</p>	Ball valves \$170,000
	Butterfly Valves: \$120,000
	Globe Valves \$190,000
	Plug Valves: \$100,000
	Gate Valves: \$150,000
	<p>The forecast for Unit 1 for 8 types of valves is \$930,00</p> <p>The forecast for both units at Vinh Tan 2 is \$1.86 million</p>



# Big U.S. Gas Turbine Valve Market

- NAFTA is the leading purchaser of valves for gas turbine combined cycle power plants. The installed capacity of gas turbines will reach 620,000 MW by 2021.
- The region will account for one third of the world capacity at that time. With the expectation of plentiful low cost gas in the region the capacity growth will continue at a high pace.
- By 2030, EIA predicts that in the U.S. natural gas generation will increase to 42 percent and coal generation will decrease to 16 percent of total power generation.
- Natural gas will provide 34 percent of the nation's electricity in 2019 continuing the trend of recent years.
- Nuclear power produced 20 percent of U.S. electricity in 2017 and is forecast to hold that level this year, then fall to 19 percent in 2019.
- Over the next three years new gas turbine combined cycle (GTCC) capacity additions will average 18 GW per year in NAFTA.
- Ten percent of existing valves will be replaced each year. This results in replacement valves for 62 GW.

Gas Turbine Combined Cycle Power Generation Capacity MW			
World Region	2018	2021	Additions
Total	1,671,315	1,892,684	221369
Africa	84,253	101,302	17049
CIS	41,694	51,285	9591
East Asia	287,688	339,962	52274
Eastern Europe	21,241	28,150	6909
Middle East	258,756	299,802	41046
NAFTA	565,612	620,299	54687
South & Central America	67,033	74,290	7257
West Asia	52,451	59,030	6579
Western Europe	292,586	318,563	25977



# U.S. Gas Turbine Valve Purchases will be \$1.56 billion per year

Half of this total will be high performance valves. The top 100 gas turbine plant owners will spend \$542 million per year for high performance valves in the NAFTA region.

The combination of a market dominated by 100 purchasers and a group which will be buying based on total cost of ownership creates the conditions for a sea change in the market.

When you consider that many of the larger participants such as Duke Power are monitoring the valves at their many plants and making decisions centrally for all plants the magnitude of the sea change increases.

How does a valve supplier interface with an end user who is using data analytics and remote monitoring to determine the total cost of ownership for each valve in the system? The answer is that the valve supplier will need to be able to understand the unique aspects of each process where valves are being used.

Flow accelerated corrosion will vary from plant to plant and system to system depending on the cycling rate. Some plants are having major problems with desuperheaters.

Are there different valve designs which would help solve the problems? Will automating the on/off valves result in a high return on investment?



## Gas Turbine Valve Purchases - NAFTA - Annual 2018-21

Category	GW	Valve Purchases \$ millions	High Performance \$ millions	Purchases by Top 100 Turbine Owners
New	18	320	160	112
Existing Replaced	62	1240	620	430
Total	80	1560	780	542

# More than Twenty Corporations each spend more than \$100 million/yr for Valves

<b>Valve Purchases in 2019 \$ millions</b>				
<b>Company</b>	<b>Type</b>	<b>Corporate Location</b>	<b>Industry</b>	<b>Valve Purchases \$millions</b>
Sinopec	Operator	China	Oil & Gas	700
Sinopec	Operator	China	Chemical	120
Sinopec	EPC	China	All	100
Sinopec	Total	China	Multiple	920
NTPC	Operator	India	Power	245
EDF	Operator	France	Power	240
Eskom	Operator	South Africa	Power	220
Bechtel	EPC	U.S.	All	350
BASF	Operator	Germany	Chemical	175

# Large Chinese Wastewater Operator will Spend Nearly \$10 million per year for Valves

BEWG operates 400 municipal wastewater plants in China, Singapore and Portugal. It also builds wastewater treatment plants.

The bulk of the purchases for its own plants will be for replacement and repair. This total of \$9.8 million does not include valves BEWG would purchase as part of its design and construction activities.

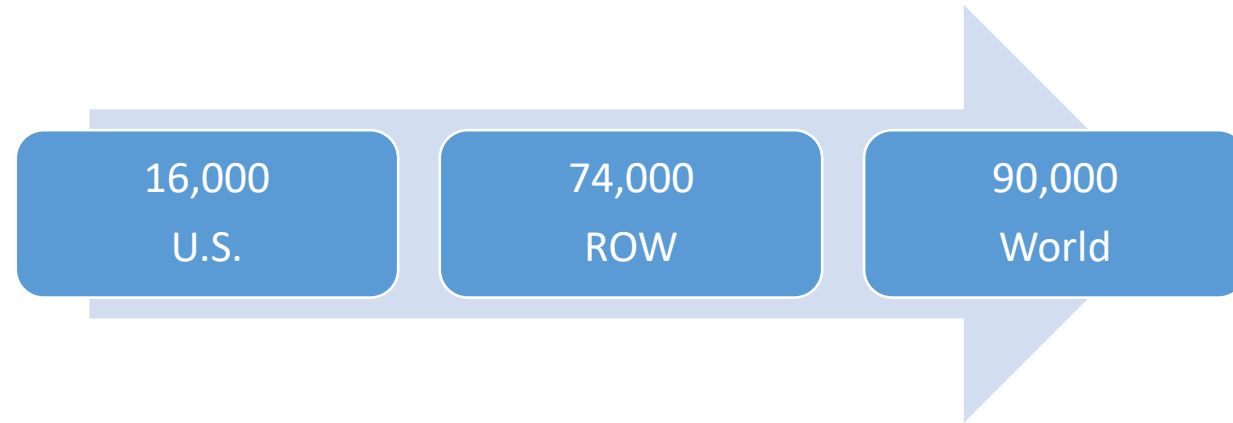
<b>BEWG Valve Purchases – 2018</b>	
<b>\$ millions</b>	
	Total
New Valves	\$900,000
Replacement valves	\$ 5,100,000
Repairs	\$ 3,800,000
Total	\$ 9,800,000

# Large California Wastewater Treatment Plant Valve Purchases -2019

Plant Name	Valves \$ millions
Hyperion	17
L.A County	11
Fountain Valley	8
San Vincente	6
Sacramento	5
Northpoint	5
East Bay	4
San Diego	4
San Jose /Santa Clara	4
San Francisco	3
San Jose Creek West	3



# 90,000 Municipal Wastewater Plants across the World will spend \$4.5 billion for Valves in 2019

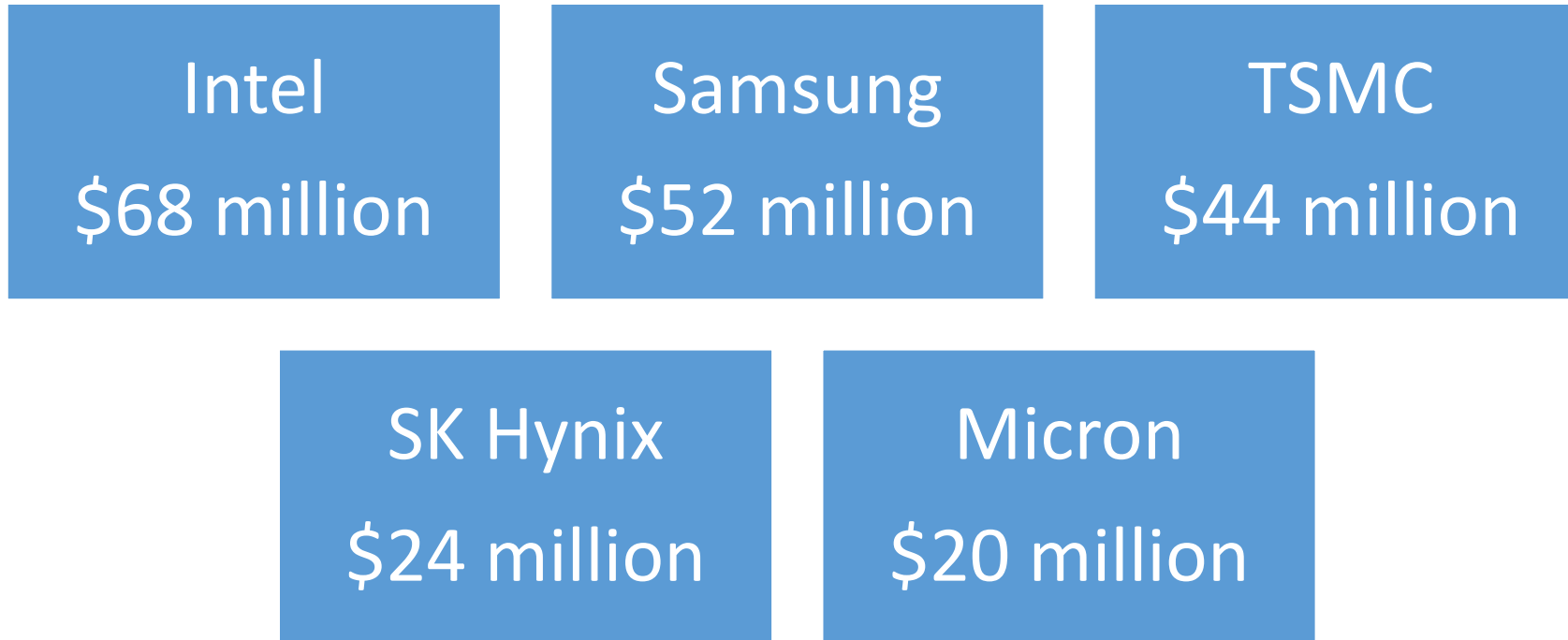


16,000 U.S. wastewater plants will spend \$1.1 billion for valves. 3500 plants will spend more than \$100K each and some large utilities with multiple sites will spend \$20 million each.



# 2019 Valve Purchases for Top Semiconductor Manufacturers

Top five producers will account for 40% of the \$400 million market



# 2019 Valve Purchases for Top Pulp and Paper Companies

Top 5 producers will account for nearly \$ billion in annual valve purchases



# Valve Purchases by the Pharmaceutical Industry

Purchases of Valves by Pharmaceutical Manufacturers \$ millions - 2019		
Rank	Company	\$ millions
1	Pfizer	80
2	Roche	60
3	Merck	50
4	Sanofi	47
5	Johnson & Johnson	47
6	Novartis	46
7	AbbVie	37
8	Gilead	35
9	AstraZeneca	33
10	Amgen	32

## Market Shares

- Top 3 - 10%
- Top 25 - 45%
- All purchasers - \$1.75 billion



# Valve Purchases by the Chemical Industry 2019

- Chemical Industry valve purchases are being increasingly made by corporate and not the plants.
- A few people at 200 corporations are buying 40% of the valves.
- The top 1000 corporations buy 80% of the chemical industry valves.

Rank	Percent of Total Valve Purchases	Cumulative Total
1-10	10	10
11-20	4.5	14.5
21-30	4.0	18.5
31-40	3.0	21.5
41-50	2.0	23.5
51-100	7.1	30.6
101-200	8.6	39.2



# Program Based on Pursuit of Individual Plants

The purchase forecasts for all customers is the first step in a complete business program to address the sea change in CFT market. There will be a high ROI achieved with direct sales programs for larger prospects. Custom websites can easily be justified for top prospects.



The sea change in the market can only be successfully navigated if the valve supplier becomes very knowledgeable about the unique processes at each major corporate client and if the supplier develops lowest total cost of ownership analyses (LTCO) for each valve type in each process. Some insights will come from third party, plant, automation and process suppliers but they also must come from subject matter ultra-experts and knowledge system providers.

