

MARKET OVERVEIW



Opportunities for Danish Wastewater Solutions in the US market

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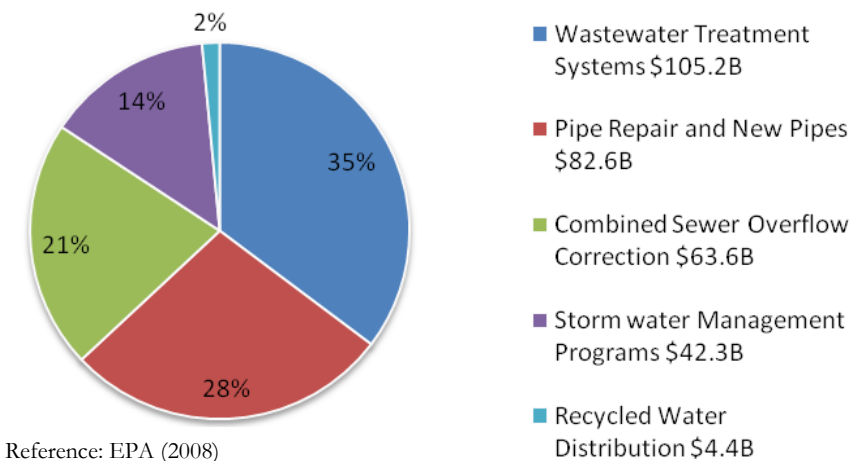
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1. Introduction: The US Wastewater Sector¹

The need for investment in wastewater services and infrastructure is critical in the US. The US Environmental Protection Agency (EPA) reports that the total investment need for the nation as of January 1, 2008² is \$ 298.1 billion within the next 20 years. The \$298.1 billion represents capital needs for publicly owned treatment facilities, wastewater pipes, combined sewer overflow corrections, stormwater management and recycling of water distribution³. The largest portion (35.3%) of the nation's needs over the next 20 years is for wastewater treatment systems (\$105.2B). However, investment needs in pipe repair/new pipes (\$82.6B), combined sewer overflow corrections (\$63.6B), stormwater management programs (\$42.3B) and recycled water distribution (\$4.4B) are all of great importance. Further, state-level planning and new regulation might also add to the investment needs (unofficial cost estimates)⁴.

Total documented investment needs



Reference: EPA (2008)

Please see Appendix 1 for explanations of the categories: wastewater treatment systems, pipe repair/new pipes, combined sewer overflow correction, stormwater management and recycled water distribution.

¹ This report is based on EPA's 'Clean Watersheds Needs Survey' 2008 Report to Congress

² The United States Environmental Protection Agency's Office of Wastewater Management, in partnership with states, territories and the District of Columbia, conducts the Clean Watersheds Needs Survey (CWNS) every four years. 2008 is the latest year of reference.

³ Data does not include information about wastewater facilities that are privately owned or that serve privately owned industrial facilities, military installations, national parks, or other federal facilities. Operation and maintenance (O&M) costs are also not included.

⁴ 47 States reported Unofficial Cost Estimates equal to \$36.8 billion. The unofficial cost estimates are not included in the report because they do not meet the documentation criteria (Appendix 2).

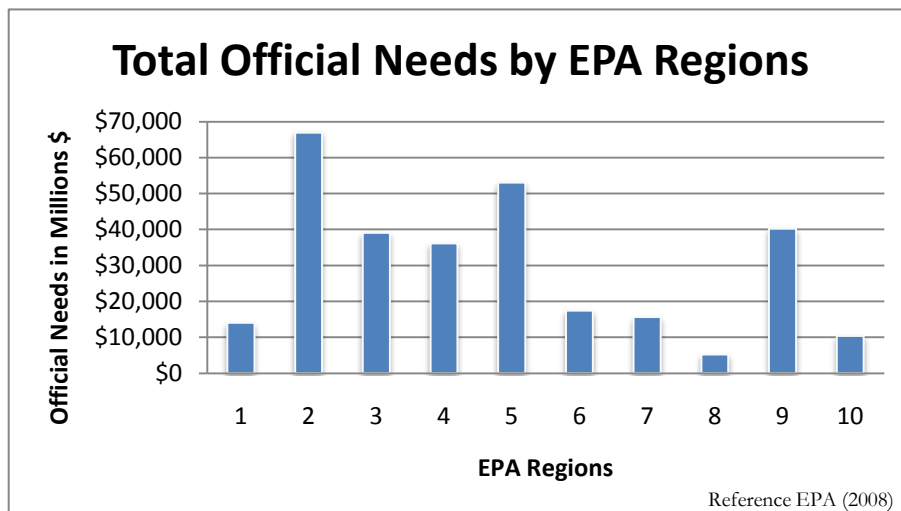
2. The US Wastewater Market: 50 States 50 Markets

The US is in general considered as one market but is in reality 50 differentiated markets. There is a great separation between the federal government and the state authority. The federal government has, mainly by The Clean Water Act, implemented wastewater legislation nationally. EPA is responsible for the national policy and regulation of the wastewater sector; however it is most likely that the different states in addition have an individual wastewater policy.

The wastewater infrastructure is primarily public owned and operated. The Mayors Water Council states that 98 % of the total investments in public wastewater systems are held by the local governments (USCM, 2010:iv).

3. Local Wastewater Problems - Local Wastewater Solutions

There are great regional differences within the US wastewater market. Rules, regulation and natural resources differ between the states. Wastewater investment needs are locally dependent and need local understanding and solutions. The US EPA has reported each State's official needs⁵ for investment.



The regions with the largest investment needs are region 2 (**New York, New Jersey, Puerto Rico**) and region 5 (**Illinois, Indiana, Michigan, Minnesota, Ohio, Wisconsin**)⁶. Region 5 has the largest number, 2,623, of facilities with official needs followed by Region 2 with 1,721 facilities with official needs⁷. Region 3 and

⁵ The unfunded capital costs of projects as of January 1, 2008 that (1) address a water quality or water quality-related public health problem existing as of January 1, 2008 or expected to occur within the next 20 years and (2) meet the CWNS documentation requirements (Appendix 2)

⁶ See Appendix 3 for definitions of EPA Regions

⁷ Number of facilities with needs by state US EPA provides a detailed information tool that gives the number of wastewater facilities at the State level, facility description (discharge, general, and stormwater), populations served, the needs for investment and contact information.

<http://iaspub.epa.gov/apex/cwns2008/?p=115:5:2414935086148167> (EPA, 2008)

4 are also of high investment needs reporting respectively 1,327 and 1,858 facilities with official needs.

State	January 2008 dollars in millions
New Jersey	32.508
California	29.910
New York	29.715
Florida	19.567
Pennsylvania	17.939
Illinois	17.503
Ohio	14.221
Texas	11.539

Reference: EPA (2008)

Further, New Jersey, California and New York have the largest investment needs of about \$30 billion. 58 % of total investment needs are within the 8 States that report needs over \$10 billion.

For an overview of each state's investment needs please see Appendix 4: map of total documented needs.

4. Facts about the US Wastewater Sector

The following summarizes the facts about this interesting sector in the US:

- ‘The nationwide system of wastewater infrastructure includes 16,000 publicly owned wastewater treatment plants, 100,000 major pumping stations, 600,000 miles (966,000 km) of sanitary sewers, and 200,000 miles (322,000 km) of storm sewers’ (USCM, 2010:1).
- ‘A number of very large systems in densely populated cities are served by original pipes that may be at least 100 years old’ (USCM, 2010:2).
- Urban areas experiences the largest investment needs of approximately 63% of the total documented needs equivalent to \$189 billion (EPA, 2008).
- ‘Wastewater services and infrastructure suffer from lack of coordinated and integrated National Strategy’ (USCM, 2010:i).
- ‘The physical condition of many of the nation’s 16,000 wastewater treatment systems is poor due to lack of investment in plants, equipment, and other capital improvements over the years’ (American Society of Civil Engineers, 2009).
- ‘Capital renewal projects have not kept pace with the increasing need to rehabilitate or replace aging infrastructure’ (EPA, 2008:x).
- ‘Billions of gallons of untreated wastewater are discharged into surface waters each year’ (USCM, 2010).

- ‘If the nation fails to meet the investment needs of the next 20 years, it risks reversing public health, environmental, and economic gains of the past three decades’ (American Society of Civil Engineers, 2009).
- ‘For every one dollar of water and sewer infrastructure investment, it is estimated that Gross Domestic Product increases by \$6.35 in the long-term. For each additional dollar spent on operating and maintaining water and sewer industry, the increase of revenue or economic output for all industries is increased by \$2.62 in that year’ (USCM, 2010:43).
- ‘For every one job added in water and sewer creates 3.68 jobs in the national economy to support that job’ (USCM, 2010:43).
- ‘Local governments are the largest employers of water and wastewater treatment plant and system operators (113,400 jobs in 2008). About 78 percent of all operators worked for local governments’ (BLS, 2009).
- ‘Employment of water and liquid waste treatment plant and system operators is expected to grow by 20 percent between 2008 and 2018, which is much faster than the average for all occupations’ (BLS, 2009).
- ‘Technology development within the US wastewater sector is conservative. Norms and traditions are seen as key barriers for new technology implementation. Regulation and approval of new technology are more complicated and based upon local approval rather than national approval’ (Sub-Segment Mapping by Danish Trade Council, 2009).

5 Financing of the Wastewater Sector

EPA has reported as of January 1, 2008 \$298.1 billion wastewater investment needs for up to a 20-year period. The public sector typically provides funding for wastewater treatment needs by local ratepayers⁸. However, federal funding and state funding are also available for the wastewater investment needs.

The “Clean Water State Revolving Fund” (CWSRF) is America’s largest water quality source and it provides more than \$5 billion annually of funding. It is a combination of federal government spending matched with State-funds, bond proceeds, and loan repayments. The CWSRF program provides funding for the quality protection projects for wastewater treatment, nonpoint source pollution control, and watershed and estuary management. Other wastewater management related funding is available through “Water Pollution Control Program Grants” for states, “Water Quality Cooperative Agreements” for states, municipalities and others, and “Clean Water Indian Set-Aside Grant Program”⁹. Programs all available through EPA.

⁸ Congressional Budget Office

⁹ Sub-Segment Mapping (2009). Danish Trade Council USA

Further, the US government program “American Recovery and Reinvestment Act of 2009” allocated \$4 billion in grants to the Clean Water State Revolving Fund (CWSRF).

Despite federal, state and local grant and funding program there is still a capital fund gap. This is where the envisioned joint export promotion will give the attendees an overview of the possibilities associated with this funding gap. Creating solutions, understand the US market is not just about a technology sales or looking for a distributor of components – but understand the need for real partnerships and be part of build, own, operate and transfer solutions, is the key to the market.

5.1 Wastewater Capital Fund Gap

The ‘federal financial assistance to local government for public wastewater has been flat since the mid to late 1980s; and has declined as a proportion of total investment’ (USCM, 2010:iv). Federal assistance has not kept pace with the needs (American Society of Civil Engineers, 2009). Therefore there exists a national wastewater capital funding gap.

5.2 Facilities must close the Funding Gap

EPA’s Sustainable Infrastructure program demands that the individual facilities implement effective and efficient solutions that can lower their overall infrastructure costs to close the funding gap, while adopting price structures that will produce the revenues to meet their funding needs. EPA is focusing their effort on asset management and efficient utility management solutions. Renewal or replacement of current infrastructure can be costly if made at an inopportune time.

To stress the importance of this particular subject EPA is working collaboratively with national organizations that support drinking water and wastewater utilities to identify the characteristics of sustainable utilities and to promote effective utility management. Together, EPA and its partners formed the “Effective Utility Management Steering Committee”, comprised of leading utility managers from across the nation. Focus is on management programs that can cut operation costs and in the same time contribute to environmental friendly services.

Further, a sustainable increase in the pricing structure that includes the long-term infrastructure needs and raises revenues to support the needs of the community must be obtained.

EPA report that, ‘while the federal government will continue to play a role in subsidizing investments through the State Revolving Loan programs, long term infrastructure sustainability can best be achieved through institutionalizing the approaches and attitudes that will close the gap in each community’¹⁰.

¹⁰ Clean Watersheds Needs Survey (CWNS) 2008

5.3 Public Private Partnership

Due to the recognition of the increased funding needs in the wastewater sector EPA sees Public Private Partnership as a way to meet funding needs that are not covered by the federal government. EPA has through the Clean Water Revolving Fund (CWSRF)¹¹ program been a full partner with states and local government to meet the nations wastewater needs. However, the CWSRF does not address all local investment needs. Public Private Partnership of wastewater facilities is therefore seen as an opportunity to close part of the funding gap. The decision on privatize should be made at the local level. EPA provides guidelines to local governments that think of exploring privatization of water facilities¹².

Further, the Trade Council has a high -quality cooperation with the National Council for Public Private Partnerships (NCPPP) which is a great resource for Danish companies. NCPPP is a non-profit and non-partisan organisation that advocates and facilitates partnerships between the private and public sector at the federal, state and local level. NCPPP has great knowledge within the sustainable solutions.

¹¹ The CWSRF program provides low-interest loans to communities for the construction of water pollution control infrastructure projects.

¹² Sub-Segment Mapping by Danish Trade Council, 2009

6 Conclusions and Recommendations for Danish Wastewater Solutions

The wastewater segment is considered the greatest market potential within the US water sector with investment needs of \$298.1 billion over the next 20 years. Great opportunities exist for Danish wastewater solutions within the areas: wastewater treatment systems, pipe repair/new pipes, combined sewer overflow correction, stormwater management and recycled water distribution.

A wastewater investment need is locally dependent and therefore also require a local solution. Not two states have the same natural resources, policy and existing wastewater technology. It is therefore important that Danish wastewater companies map their solutions towards the single state or even community. Understanding the differences between the states is crucial for being successful at the US market.

New Jersey, California and New York have the largest investment needs when looking at the wastewater sector in general. However, it is important to notice that some of the areas within the wastewater sector (wastewater treatment systems, pipe repair/new pipes, combined sewer overflow correction, stormwater management and recycled water distribution) might have a larger demand in some of the other states or even communities. District of Columbia (DC) and the states around are for instance reporting great investment needs for combined sewer overflow and stormwater, whereas, Region 4 especially Florida demand investments in advanced wastewater treatment systems.

Despite the large investment needs in the US wastewater sector a capital funding gap exists which gives further challenges to the sector. The federal government and the state authorities provide funding opportunities for the needs within the wastewater segment. However, due to lack of investments, an aging infrastructure, higher legislative requirements, and an increase in population that needs wastewater services, not all investment needs can be met by the current funding opportunities.

The US EPA sees Public Private Partnerships as an opportunity to increase capital and expertise within the wastewater sector. However, the decisions about engagement in Public Private Partnerships are made locally by the governments and local authorities.

There exist great opportunities for Danish companies within the wastewater sector that can increase efficiency and lower operation costs at the wastewater facilities. Due to the funding gap it is emphasized that facilities should try to reduce the funding gap by lower operation costs and in the same time increase the price of the wastewater service in a sustainable way to create revenue for further investment. This also creates opportunities for Danish companies that have expertise within water and energy efficiency systems and technology.

7 Lists of References

(A&WMA) Air & Waste Management Association

www.awma.org

(AWWA) American Water Works Association

www.awwa.org

(ASCE) American Society of Civil Engineers, 2009. Report Card for America's Infrastructure.

www.infrastructurereportcard.org/fact-sheet/wastewater

(BLS) Bureau of Labor Statistics, 2010. Occupational Outlook Handbook, 2010-11 Edition.

www.bls.gov/oco/ocos229.htm

(CWSRF) Clean Water State Revolving Fund (CWSRF)

http://water.epa.gov/grants_funding/cwf/cwsrf_index.cfm

(EMS) General Environmental Management System

<http://water.epa.gov/polwaste/wastewater/Voluntary-EMS-ISO-14001.cfm>

(EPA) Environmental Protection Agency, 2008. Clean Watersheds Needs Survey 2008 Report to Congress.

<http://water.epa.gov/scitech/datatit/databases/cwns/upload/cwns2008rtc.pdf>

(NACWA) National Association of Clean Water Agencies

www.nacwa.org

(NCPPP) National Council of Public Private Partnerships

<http://www.ncppp.org/>

(OWM) EPA Office of Wastewater Management

www.epa.gov/aboutepa/ow.html

Sub-Segment Mapping (2009). Danish Trade Council USA.

(USCM) The U.S. Conference of Mayors, Mayors Water Council (2010): Trends in Local Government Expenditures on Public Water and Wastewater Services and Infrastructure: Past, Present and Future.

<http://www.usmayors.org/publications/201002-mwc-trends.pdf>

(WEF) Water Environment Federation

www.wef.org

(WERF) Water Environment Research Foundation (WERF)

www.werf.org

Appendix 1 Official Needs Categories¹³

1. Wastewater Treatment Systems

I. Secondary Wastewater Treatment

This category includes needs and costs necessary to meet the minimum level of treatment that must be maintained by all treatment facilities, except those facilities granted waivers of secondary treatment for marine discharges under section 301(h) of the Clean Water Act. Secondary treatment typically requires a treatment level that produces an effluent quality of 30 mg/l of both BOD₅ and total suspended solids (secondary treatment levels required for some lagoon systems may be less stringent). In addition, the secondary treatment must remove 85 percent of BOD₅ and total suspended solids from the influent wastewater.

II. Advanced Wastewater Treatment (CAT II)

This category includes needs and costs necessary to attain a level of treatment that is more stringent than secondary treatment or produce a significant reduction in nonconventional or toxic pollutants present in the wastewater treated by a facility. A facility is considered to have Advanced Wastewater Treatment if its permit includes one or more of the following: Biochemical Oxygen Demand (BOD) less than 20mg/l; Nitrogen Removal; Phosphorous Removal; Ammonia Removal; Metal Removal; Synthetic Orga

2. Pipe Repair and New Pipes

III-A. Infiltration / Inflow (II) Correction

This category includes needs and costs for correction of sewer system infiltration/inflow problems. Infiltration includes controlling the penetration of water into a sanitary or combined sewer system from the ground through defective pipes or manholes. Inflow includes controlling the penetration of water into the system from drains, storm sewers, and other improper entries. It also includes costs for preliminary sewer system analysis and detailed sewer system evaluation surveys.

III-B. Sewer Replacement / Rehabilitation

This category includes needs and costs for the maintenance, reinforcement, or reconstruction of structurally deteriorating sanitary or combined sewers. The corrective actions must be necessary to maintain the structural integrity of the system.

IV-A. New Collector Sewers and Appurtenances

This category includes the costs of new pipes used to collect and carry wastewater from a sanitary or industrial wastewater source to an interceptor sewer that will convey the wastewater to a treatment facility.

IV-B. New Interceptor Sewers and Appurtenances

This category includes needs and costs for constructing new interceptor sewers and pumping stations to convey wastewater from collection sewer systems to a treatment facility or to another interceptor sewer. Needs and costs for relief sewers are included in this category.

¹³ EPA 'Clean Watersheds Needs Survey' 2008 Report to Congress

3. Combined Sewer Overflow Correction

V. Combined Sewer Overflow (CSO) Correction

This category includes needs and costs to prevent or control the periodic discharges of mixed stormwater and untreated wastewater (combined sewer overflows) that occur when the capacity of a sewer system is exceeded during a wet weather event. This category does not include needs and costs for overflow control allocated to flood control, drainage improvement, or the treatment or control of stormwater in separate storm systems.

4. Stormwater Management Programs

VI. Stormwater Management Programs (pre-2008 needs only)

This category includes the needs and costs to plan and implement structural and nonstructural measures to control the runoff water resulting from precipitation (stormwater). It includes controlling stormwater pollution from diffuse sources by (1) reducing pollutants from runoff from commercial and residential areas that are served by the storm sewer, (2) detecting and removing illicit discharges and improper disposal into storm sewers, (3) monitoring pollutants in runoff from industrial facilities that flow into municipal separate storm sewer systems, and (4) reducing pollutants in construction site runoff discharged to municipal separate storm sewers.

Needs and costs may be reported for Phase I, Phase II, and non-traditional (e.g., universities, prisons, school districts) municipal separate storm sewer systems (MS4). Unregulated communities can also report needs and costs in this category (formerly reported in VII-D: NPS-Urban).

Only pre-2008 needs and costs are in Category VI. For 2008 and future surveys, Stormwater Management Program needs and costs must be reported in sub-categories VI-A to VI-D described below.

VI-A. Stormwater Conveyance Infrastructure

This category includes the needs and costs to address the Stormwater Management Program activities associated with the planning, design, and construction of conveying stormwater via pipes, inlets, road side ditches, and other similar mechanisms.

VI-B. Stormwater Treatment Systems

This category includes the needs and costs to address the Stormwater Management Program activities associated with the planning, design, and construction of treating stormwater with wet ponds, dry ponds, manufactured devices, and other similar means.

VI-C. Green Infrastructure

This category includes the needs and costs to address the Stormwater Management Program activities associated with the planning, design, and construction of low impact development and green infrastructure, such as bioretention, constructed wetlands, permeable pavement, rain gardens, green roofs, cisterns, rain barrels, vegetated swales, restoration of riparian buffers and flood plains, etc. Projects in this category can be both publicly-owned and privately-owned.

VI-D. General Stormwater Management

This category includes the needs and costs to address the Stormwater Management Program activities associated with the planning, design, and construction of treating stormwater with wet ponds, dry ponds, manufactured devices, and other similar means. This category includes the needs and costs to address the Stormwater Management Program activities associated with implementing a stormwater management program, such as Geographic Information Systems (GIS) and tracking systems, equipment (e.g., street sweepers, vacuum trucks, etc.), stormwater education program start-up costs (e.g., setting up a stormwater public education center, building a traveling stormwater education display), and stormwater management plan development.

5. Recycled Water Distribution

X. Recycled Water Distribution

This category includes the needs and costs associated with conveyance of treated wastewater that is being reused (recycled water), including associated rehabilitation/replacement needs. Examples are pipes to convey treated water from the wastewater facility to the drinking water distribution system or the drinking water treatment facility and equipment for application of effluent on publicly-owned land.

The needs and costs associated with additional unit processes to increase the level of treatment to potable or less than potable but greater than that normally associated with surface discharge needs are reported in Category II.

Appendix 2 Documentation Criteria

EPA, in consultation with the CWNS 2008 National Workgroup, established seven criteria for States to document each need:

1. A description of the current or potential water quality impairment and information on its potential source. The problem description needed to include specific pollutant source information and/or specific threats to the waterbody.
2. The location of the problem. A single latitude/longitude point or an area (e.g., polygon, county, watershed) needed to be identified.
3. The solution to the problem. One or more specific pollution control measures or best management practices (BMPs) needed to be identified.
4. The cost for each solution. The cost to implement each pollution control measure or specified BMP needed to be provided.
5. The source of the cost. Documentation (e.g., engineer's estimates, costs from comparable practices, estimates from equipment suppliers) for each solution needed to be identified.
6. The total cost. The total cost of all pollution control measures and BMPs documented for the facility or project needed to be provided.
7. Current documentation. For records with total needs greater than \$20 million (January 2008 dollar base), the documentation date of all documents needed to be January 1, 2002, or more current. For all other needs, the documentation date needed to be January 1, 1998, or more current.

Appendix 3 Definition of EPA Regions

Region 1:

- Connecticut, CT
- Massachusetts, MA
- Maine, ME
- New Hampshire, NH
- Rhode Island, RI
- Vermont, VT

Region 6:

- Arkansas, AR
- Louisiana, LA
- New Mexico, NM
- Oklahoma, OK
- Texas, TX

Region 2:

- New Jersey, NJ
- New York, NY
- Puerto Rico, PR
- Virgin Islands, VI

Region 7:

- Iowa, IA
- Kansas, KS
- Missouri, MO
- Nebraska, NE

Region 3:

- District of Columbia, DC
- Delaware, DE
- Maryland, MD
- Pennsylvania, PA
- Virginia, VA
- West Virginia, WV

Region 8:

- Colorado, CO
- Montana, MT
- North Dakota, ND
- South Dakota, SD
- Utah, UT
- Wyoming, WY

Region 4:

- Alabama, AL
- Florida, FL
- Georgia, GA
- Kentucky, KY
- Mississippi, MS
- North Carolina, NC
- South Carolina, SC
- Tennessee, TN

Region 9:

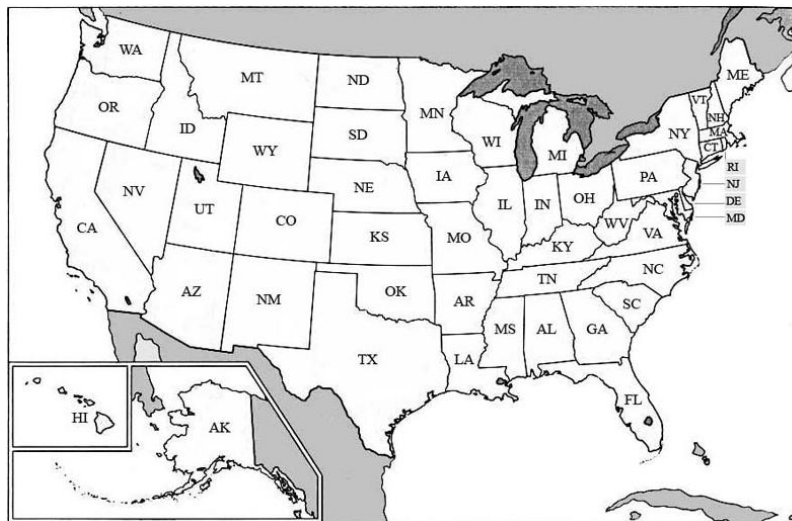
- American Samoa, AS
- Arizona, AZ
- California, CA
- Guam, GU
- Hawaii, HI
- Northern Mariana Islands, MP
- Nevada, NV

Region 5:

- Illinois, IL
- Indiana, IN
- Michigan, MI
- Minnesota, MN
- Ohio, OH
- Wisconsin, WI

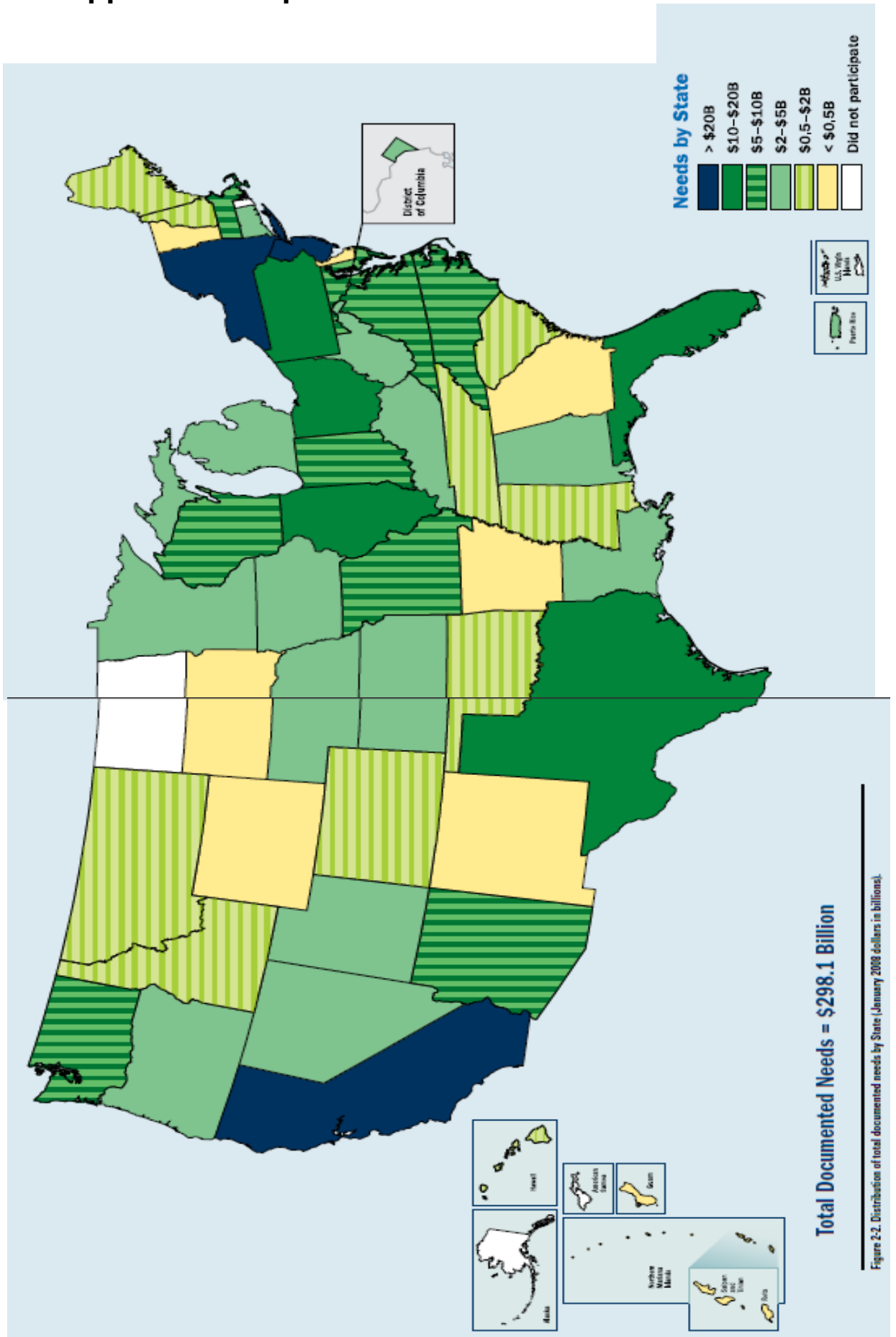
Region 10:

- Alaska, AK
- Idaho, ID
- Oregon, OR
- Washington, WA



Reference: statemapsonline.com

Appendix 4 Map of Total Documented Needs



The Trade Council is a part of the Ministry of Foreign Affairs and is the official export and investment promotion agency of Denmark. The Trade Council benefits from around ninety Danish Embassies, Consulates General and Trade Commissions abroad. The Trade Council advises and assists Danish companies in their export activities and internationalisation process according to the vision: Creating Value All the Way.

The work in the Trade Council follows specific procedures and quality guidelines. In this way our customers are secured the best possible quality under the varying working and market conditions at any given point of time.

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