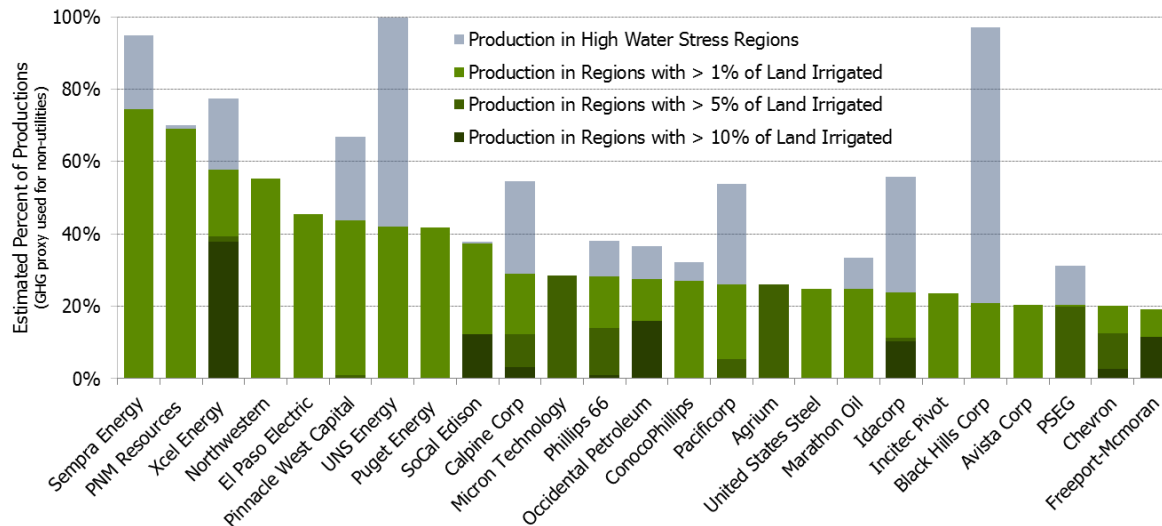


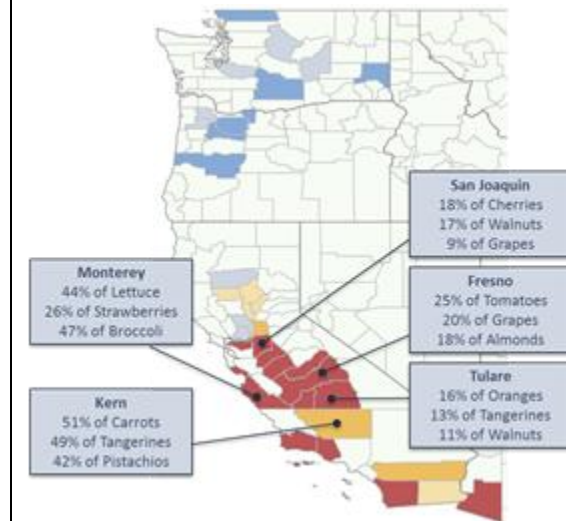
KEY FINDINGS

- Among 972 irrigation-intensive counties, 412 are currently facing moderate-to-high levels of water stress, which accounts for 23% of total U.S. land area.
- Corn, the largest traded agricultural commodity on a daily basis, is also the most exposed to agro-industrial water resource conflict, with an estimated **USD 900 million in production value at risk**. However, the sugar beet crop is the most exposed on a relative basis, with **approximately 8% of the U.S. sugar beet crop potentially in conflict with industrial water users**.
- Within the utilities and oil & gas industries, **Xcel Energy and Occidental Petroleum have the highest proportion of assets located in regions in which more than 10% of land is irrigated cropland and water supplies are highly stressed**.
- While Canada is not typically associated with water stress, recent growth in unconventional oil and gas extraction may alter this perception in Alberta. **Between 2004 and 2012, unconventional oil and gas production in moderate-to-high water stress regions increased by 268% in Canada.**

FIGURE 1 Percentage of production attributed to U.S. counties that face high water stress and are dependent on irrigated agriculture



US WATER STRESSED COUNTIES ACCOUNTING FOR >5% PRODUCTION OF AT LEAST ONE MAJOR CROP IN CONFLICT WITH INDUSTRY



FRAMEWORK

We assessed the risk of agro-industrial water conflict for 110 publicly traded, water-intensive companies by mapping facilities to U.S counties that are dependent on irrigated agriculture and face high water stress.

REPORT CONTENT

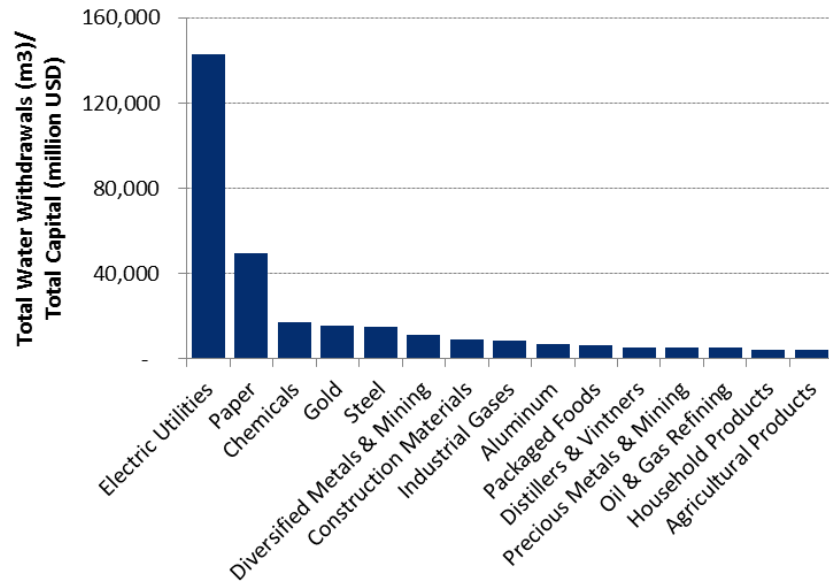
Executive Summary

AUTHOR

Cyrus Lotfipour, Senior Analyst

## Severe Drought Increases Risk of Water Resource Conflict

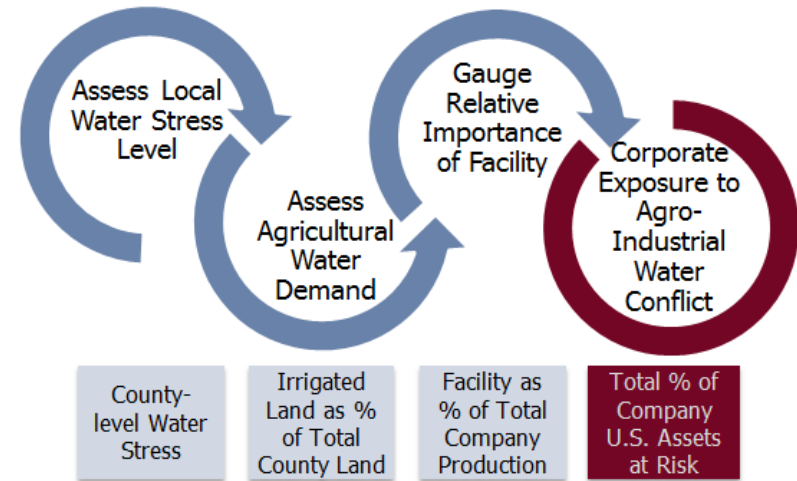
The competition for water is most pronounced in regions where water-intensive industrial activities, such as power generation, chemicals production, and oil and gas production, overlap with highly irrigated agricultural lands. Regional electric utilities, oil and gas companies, and metals manufacturers stand to lose the most if water stress levels worsen.



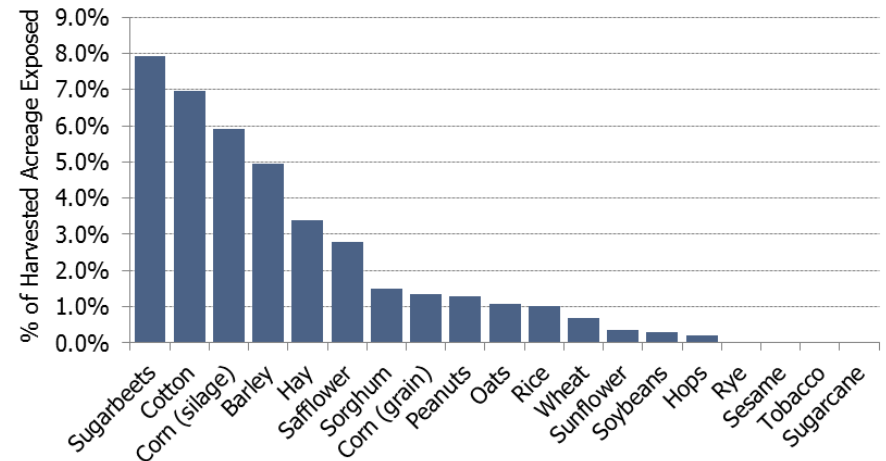
Source: MSCI ESG Research

### Framework

We use a three-step process to determine the companies that are exposed to risks related to agricultural water conflict. Among industrial water users in the U.S., the oil and gas extraction, petroleum refining, paper, and chemicals industries are the most water-intensive and may face the most immediate material impact from water conflict. **Phillips 66** has the highest exposure to both highly-irrigated and highly stressed regions (28%) in the U.S. oil and gas industry, which is followed closely by **Occidental** (27%), **ConocoPhillips** (27%), and **Marathon** (25%). For electric utilities, approximately one-third of US utilities on the MSCI US IMI index have more than 10% of their total electricity generation attributed to water stressed regions – approximately 22% of these companies also have a significant proportion of assets in irrigation-intensive regions, which heighten risks related to intra-sector competition.



Among water-stressed counties where industrial facilities comprise a significant source of water demand, crops that are most at risk include sugar beets, cotton, corn for silage, and barley. Among the major crops that are traded on commodity exchanges, including corn, soy, and wheat, the percentage of total U.S. cropland that is exposed to potential water conflict with industrial users ranges from 0.5% to 5.8%, accounting for USD 1.2 billion in sales per year.



Sources: United States Department of Agriculture; Gassert, F., M. Luck, M. Landis, P. Reig, and T. Shiao. 2013. "Aqueduct Global Maps 2.0." Working Paper. Washington, DC: World Resources Institute; MSCI ESG Research

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<sup>1</sup>As of March 31, 2014, as reported on June 25, 2014, by eVestment, Lipper and Bloomberg