



Meeting Recap

Thursday, May 26, 2022
1:30 p.m. to 2:45 p.m.

1. Welcome

Cheryl Angeles, Supervisor, Purchasing Authority Unit (PAU), Policy, Training & Customer Services (PT&CS) Branch, Procurement Division (PD), Department of General Services (DGS)

Cheryl Angeles opened the meeting to welcome all participants and provided instructions on participating in the Purchasing Authority Round Table (PART) Microsoft Teams meeting. She reminded participants to mute speakers to minimize background noise. Opportunities to answer questions will be provided at the end of each speaker's presentation and at the end of the PART meeting.

2. Procurement Division Updates

Angela Shell, Deputy Director, PD, DGS

Broadcast Bulletins

- Two have been released since April – based on Executive Orders regarding Russian sanctions
 - Includes instructions and guidance in conjunction with OLS information
 - DGS acknowledges it takes a significant effort to comply
 - Reach out to DGS if there are challenges in implementing or assistance is needed
- Appreciation given to state agencies for their efforts to comply with the Executive Orders.

Supply Chain Impacts

- Utilize NASPO company to provide data and survey companies
 - Analysis on commodity trends in supply chain issues (see Attachment 1)
- Lumber prices are expected to steadily decline over the next three years as supply from lumber producers catches up to demand, following periods of extremely high demand due to increased home and residential construction projects.
- Some items such as electronics are still having supply chain issues while other commodities are returning to normal.
- Analysis also provided on secondary commodity markets. For example, how aluminum is used in secondary industries, construction, and public works contracts.
 - The cost of aluminum will continue to increase in the next two years and will decrease in the subsequent three years.
 - Utilized mostly in cameras

PD Survey Results

- In progress
- Evaluated comments and PD is working on improvement plans
- More information to come
- Results will be provided by end of fiscal year

SB/DVBE Training

- Strategic goal for the next two years
- Training dates will be posted on DGS website
- PD reached out to state agencies for sample external SB/DVBE training already in place

Legislative Bills

- PD response to legislative bills including SB/DVBE, sustainability, carbon neutrality and PD's statewide perspective
- State agencies are responsible for implementation of any passed legislation

IT Project - FISCal Enhancement (eMarketplace)

- Enhanced catalog and punch out functionality similar to PIA
- Business reporting requirements:
 - Enter bidding opportunities
 - Sustainability tools to capture EPP spend

DGS Partnership with CDT on IT Procurement Classifications

- Determine, define and categorize IT goods/services for easier classification identification
- Streamline procurement processes and update IT policies
- Workgroup named Categorization of All Technology, Telecom and Internet of Things Effort (CATTIE)
- In response to ever changing technology, working on guidance on subscription and on-line publications
- Clarify IT project classifications and DGS & CDT proper approval routing associated with NCB acquisition method

3. Office of Small Business and Disabled Veteran Enterprise Services (OSDS) Updates Demeshia Swanson, OSDS Business Outreach Manager, PD, DGS

- Small Business Eligibility Requirements
 - Completed Escalation study - every two years the DGS director is required to conduct a biennial review of the three-year average gross annual receipts (GARs) eligibility standards for all small business certification types and adjust those levels to reflect changes to California Consumer Price Index (CCPI).
 - OSDS is responsible to conduct this review and make recommendations to the DGS Director.

- The recommendation was accepted by the DGS Director and communication on the Escalation Study will be sent to state agencies shortly.
 - The size standards will be as follows:
 - MB: Remains at \$5 million
 - SB: Changed from \$16 million to \$17 million
 - SB Public Works: Changed from \$36 million to \$37 million
- Consolidated Annual Report
 - Completed two training courses for FI\$Cal users on May 17 and 19. Two more training courses on Zoom and Microsoft Teams platforms are scheduled for June 2 and 7 for non-FI\$Cal users.
 - Final 2021-2022 report is pending management approval
 - Information is available on DGS website
- Diversity Data Collection
 - Captures all new businesses registering with the state and existing registered businesses (bidders, vendors/suppliers, or certified firms) within their profile on Cal eProcure.
 - Go live in FI\$Cal on April 13
 - A communication was sent to all vendors in the FI\$Cal system
 - Developed FAQs for suppliers and is currently on DGS Statewide Supplier Diversity Program website
 - Collected data on business owners includes race, sexual orientation, and gender
- DVBE Subcontracting Requirements
 - Introduction to the passed statutes and new forms - STD 817 for prime contractors and DGS, PD 810D forms for state agencies:
 - Assembly Bill (AB) 230
 - AB 1365
 - Senate Bill 588
 - Two training courses
 - PD assisted with contract questions
 - Over 300 state agency contracting officials attended
 - Finalizing FAQs from training courses and will be included in SCM 1 & 2 as well as posted on the DGS website.

4. Upcoming Leveraged Procurement Agreements (LPAs)

Carol Bangs, Branch Chief, Acquisitions Branch, PD, DGS

Stephanne Lim, Supervisor, Master Agreements Unit 2, PD, DGS

LPAs

- MSA Office Movers - slight delay on Broadcast Bulletin release. Encourage agreements to extend for six months of coverage
- Copy Paper – customer survey sent to gain perspective on state agency’s usage
- PC Goods (laptops and desktops) - multiple suppliers, effective July 1

IT Consultant Contract Summary

- 330 Contract Awards
 - 189 Small Businesses
 - 12 DVBEs
- Contract Term
 - April 21, 2022, to April 20, 2025 with two optional two-year extensions.

New Labor Categories

Data Analyst	Data Modeler
Senior Data Analyst	Data Warehouse Architect
Geospatial Analyst	Product Lead
Geospatial Application Developer	User Experience Researcher
Business Intelligence Analyst	Customer Experience Architect
Data Scientist	Customer Experience Analyst
Senior Data Scientist	Analyst
Data Engineer	Information Technology Expert
Senior Data Engineer	

- Agile Classifications
 - Agile Coach
 - Analyst
- Agencies/state entities requesting the use of Agile Classifications for Non-Delegated IT Projects must seek approval from California Department of Technology (CDT) prior to use. Contact adpq@state.ca.gov with any requests.

RFO Project Dollar Value	Total MSA contractors eligible to respond	Minimum # of users must solicit (i.e., email RFO)	Minimum # of responses or non- responses users must document*	Minimum # of final offers required for RFO award
Up to \$500,000.00	328	3	3	1
Up to \$1,500,000.00	283	3	3	1
Up to \$5,000,000.00	182	9	3	1
Up to \$10,000,000.00	87	15	3	1

Additional Information

- DGS Website: Go to www.dgs.ca.gov and type “TDDC” in the search function
- Visit Cal eProcure

- Review DGS User Instructions
- Email: DGSITConsultingMSA@dgs.ca.gov

5. NCB Portal's New Look

Renata Raspberry, Supervisor, Dispute Resolution Unit (DRU), PD, DGS
Heather Camp, Lead Information Technology Specialist I, DRU, PD, DGS
Michael Lower, Associate Governmental Program Analyst, DRU, PD, DGS

NCB Portal: Current View

Why the change?

The current "iframe" view in the NCB Portal is no longer supported by ServiceNow.

NCB Portal: New View in Mid-July 2022

What changes are being made?

The justification will be in the mobile style.

State option at the top will be labeled.

What is not changing?

Required fields, visibility and other messages should work the same.

PLEASE NOTE: The portal is always being worked on to enhance the customer experience. If you have questions or suggestions on the NCB Portal please email: PDNCB@dgs.ca.gov.

Home > NCB > Non Competitive Bid Requests > NCB Contract Justification

NCB Contract Justification

Non-Competitively Bid (NCB) Contract Justification

New view of the NCB Portal

State

Choose "New" if you may need to update any portion of this form before submitting for approval.

Choose "Dept / Agency Approval" to send this request for approvals as soon as you submit this form.

New

* Justification type

-- None --

* Short description

* Description

Provide a brief description of the NCB Request, including all goods and/or services the contractor will provide.

* Requesting organization

Instructions

Department contact information

* Contact

Submit

Required information

Justification type	Short description
Description	Requesting organization
Contact	Business phone

TACPA Updates (AB 1574)

- Broadcast Bulletin P-06-22 was released on May 20, 2022 announcing the update to SCM, Volume 2 to incorporate clarification of AB 1574:
 - Michael Lower assigned as the TACPA subject matter expert
 - Worksite preferences are now identified as Workplace preferences.
 - Hiring preferences are now identified as Workforce preferences.
 - The combined cost of preferences (i.e., Workplace & Workforce) shall not exceed one hundred thousand dollars (\$100,000) in total.
 - TACPA applications are reviewed by DGS-PD-DRU. (TACPA@dgs.ca.gov)
 - Review time is up to five business days.
- Additional Updates to look out for:
 - Updated Regulations
 - Updates to SCM, Volume 1
 - Updates to TACPA forms (i.e., STD. 830, DGS PD 525, and DGS PD 526)
- TACPA Helpful Hints:
 - Use TACPA sample solicitation language in SCM, Volume 2, Chapter 12 Socioeconomic Programs, Section 1207, TACPA Competitive Solicitations

If you have additional program specific questions, please feel free to email TACPA@dgs.ca.gov.

6. New FI\$Cal PO Payment Tool

Mary Snovel, FI\$Cal Procurement Lead, DGS

Prompt Payment Act

The Prompt Payment Act requires “state agencies pay properly submitted, undisputed invoices, refunds, or other undisputed payments due to individuals within 45 days of receipt or notification thereof, or automatically calculate and pay the appropriate late payment penalties as specified in this chapter.”

Government Code, Chapter 4.5, Sections 927-927.13

Functionality Benefits

- **Transparency**
 - Public Information. No log in needed.
 - Suppliers/sub-contractors can track payment dates.
- **Compliance**
 - Sub-contractors have proof of payments from the department to a prime.
 - Departments can track Purchase Orders to Payment History for Prompt Payment.
- **Customer Satisfaction**
 - Assistance with timely and accountable payments.
 - Accessible on Cal eProcure site (public site), whenever needed.
 - Provides a summary and detailed report of all subcontracting, invoice, and payment information.
 - This is extracted data entered by the departments into FI\$Cal. If there are any inconsistencies, it may be necessary to contact the department.

FI\$Cal One state. One system.

FI\$Cal Purchase Order Payment History Search
Overview

One (1) search criteria is required. Some Purchase Orders may not display due to their confidential information. Please contact the purchasing department for assistance.

Supplier Name: Search
 Supplier ID: 000011105
 Sub Contractor Name: Search
 Sub Contractor Bidder/Supplier ID: Search
 Purchase Order (PO) ID: Search

Business Unit (BU) or Department Name: Search
 Invoice Number: Search
 Purchase Order Date: 6/30/2000 12/31/2022
 Invoice Date: 3/1/2000 3/1/2049
 Payment Date: 6/8/2014 5/4/2046

This display is a summary view of your search. To view the Details: Right click on the row > Select Drill through > Select from options: Invoice Details, Sub Contractor Details, or All Details. **Displayed Rows: 28**

Supplier Name	Supplier ID	Cert Type	BU/Department Name	PO ID	PO Date	Buyer Name	Buyer Email	Sub Contractors	Invoice
3D DATACOM	0000011105		2720-Dept of the CA Highway Patrol	0000019005	06/21/2021	Michelle meyer	michelle.meyer@chp.ca.gov	Details	Details
3D DATACOM	0000011105		2720-Dept of the CA Highway Patrol	0000019007	06/21/2021	Michelle meyer	michelle.meyer@chp.ca.gov	Details	Details
3D DATACOM	0000011105		7760-Department of General Services	0000010792	03/26/2018	Sara Cunningham	sara.cunningham@dgs.ca.gov	Details	Details
3D DATACOM	0000011105		7760-Department of General Services	0000012864	08/02/2018	Eric Waddell	eric.waddell@dgs.ca.gov	Details	Details
3D DATACOM	0000011105		7760-Department of General Services	0000019318	07/09/2018	Eric Waddell	eric.waddell@dgs.ca.gov	Details	Details
3D DATACOM	0000011105		7760-Department of General Services	0000019633	08/05/2019	Carolina Ramos	carolina.ramos@dgs.ca.gov	Details	Details
3D DATACOM	0000011105		7760-Department of General Services	0000022644	12/16/2019	Sara Cunningham	sara.cunningham@dgs.ca.gov	Details	Details
3D DATACOM	0000011105		7760-Department of General Services	0000025499	04/23/2020	James Frolich	james.frolich@dgs.ca.gov	Details	Details
3D DATACOM	0000011105		2720-Dept of the CA Highway Patrol	0000014981	12/10/2020	Tina Lewis	tina.lewis@chp.ca.gov	None	Details
3D DATACOM	0000011105		2720-Dept of the CA Highway Patrol	0000017673	05/04/2021	Tina Lewis	tina.lewis@chp.ca.gov	None	Details
3D DATACOM	0000011105		2720-Dept of the CA Highway Patrol	0000022824	02/02/2022	Kristina Crowe	kristina.crowe@chp.ca.gov	None	Details
3D DATACOM	0000011105		4440-Department of State Hospitals	0000014172	12/11/2019	Patricia Patten	patricia.patten@dsh.ca.gov	None	Details
3D DATACOM	0000011105		4440-Department of State Hospitals	0000014867	01/09/2020	Connie Smith	connie.smith@dsh.ca.gov	None	Details
3D DATACOM	0000011105		4440-Department of State Hospitals	0000015197	01/27/2020	Cindy Vang	cindyvang3@dsh.ca.gov	None	Details
3D DATACOM	0000011105		4440-Department of State Hospitals	0000019236	06/25/2020	Patricia Patten	patricia.patten@dsh.ca.gov	None	Details
3D DATACOM	0000011105		4440-Department of State Hospitals	0000021834	09/23/2020	Patricia Patten	patricia.patten@dsh.ca.gov	None	Details
3D DATACOM	0000011105		4440-Department of State Hospitals	0000026437	04/22/2021	Jennifer Xiong	jennifer.xiong@dsh.ca.gov	None	Details
3D DATACOM	0000011105		4440-Department of State Hospitals	0000028287	07/20/2021	Patricia Patten	patricia.patten@dsh.ca.gov	None	Details
3D DATACOM	0000011105		4440-Department of State Hospitals	0000031653	11/29/2021	Patricia Patten	patricia.patten@dsh.ca.gov	None	None
3D DATACOM	0000011105		5227-State & Community Corrections	0000001728	02/05/2018	Denise Esmal	denise.esmal@bscc.ca.gov	None	Details
3D DATACOM	0000011105		5227-State & Community Corrections	0000003676	10/08/2019	Denise Esmal	denise.esmal@bscc.ca.gov	None	None

Power BI (Business Intelligence) Report

- Report is an MS data reporting tool
- Search by supplier name, state agency, etc.
- No confidential information in reports
- Buyer ID is not included
- Job Aids will be available for this reporting tool

7. Policy Updates

Sarah Cering, Branch Chief, PT&CS Branch, PD, DGS

PIA

- Quote expirations are now 45 days instead of 90 days
- Draft feedback planned to be sent to state agencies in two weeks

TACPA (AB 1574)

- Although DGS can make changes to update state law, DGS does not have the authority to change federal-based TACPA laws
- TACPA SCM policy update – state agency feedback will be sent soon
- Send TACPA applications to Michael Lower for approval
 - DGS to review criteria and is considering delegating back to state agency

SB (AB 1574)

- State agency feedback will be sent in the next four weeks
- Expand SB vendor pool
- Reminder of the acquisition method SB Option
- Update splitting orders policy to allow dividing large contracts which would give more SBs a chance to complete
- Advertising fee waived

Proprietary Digital Publication

- CDT collaboration
- New policy for proprietary digital publications – exempt by policy and exempt from advertising
- One-time purchase
- Access via SaaS – renting ability to access digital publications
- Policy draft estimated completion on June 15 and to be sent to PART members for feedback
- Use of PO instead of STD 213

Categorical Exemptions

- Update categorical exemptions for proprietary outreach such as Facebook and Twitter

Classifications

- Clarify classifications of Survey Monkey type procurements

IT General Provisions (GPs) Refresh

- Estimated completion by end of 2022
- Input on data security and include an open forum to suppliers
- In response to FAQs on IT GPs for low-risk purchases and contract classifications
- Small business' feedback: GPs for low risk in order to reduce SB non-responsiveness
- CalPCA to develop contract classification training

- Scrutinize formatting to provide user friendly access and provide low risk.
 - Options for consideration: 1) Multiple documents which would have attachments and identify the applicable GPs, or 2) one document with a list of all GPs to choose from and each has clarifying information on an if/then scenario to decide if chosen provision(s) would apply.

SCM Phase 2

- Review and update format and content
- Subject matter experts are gearing up for phase 2 of the SCM project
- Continue to update for the rest of 2022

DGS Procurements

- Improvements in the NCB process, policy format and questions planned for later in the year

SIMM 71B

- CDT announced the formation of a “Technology Procurement Community of Practice Participation” group
- Group is a network of technology professionals geared towards working with government and other local partners.
- Newsletter will be sent to PART members as the first distribution for this group

8. PD Engineering Updates

Mark Wriston, Senior Procurement Engineer, Environmentally Preferable Purchasing, PD, DGS

EPP Contracts & Reporting

- Environmentally Preferable Purchasing (EPP) contracts can be found on the Procurement Division (PD) website <https://www.dgs.ca.gov/PD> by clicking on:
 - Buying Green Guide
 - State Contracts Index Listing (Excel spreadsheet)
- When your department buys EPP, it will be reported on the green buyer website www.green.ca.gov/buyer.
- The data is used to calculate the winners of the annual State Agency Recognition Award.

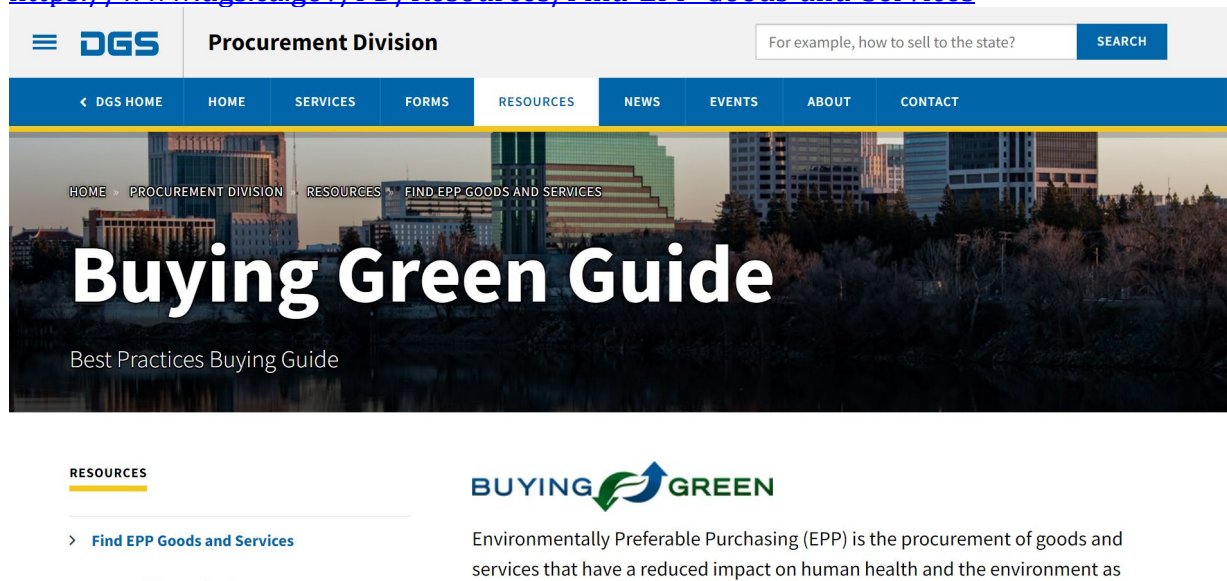
EPP Training

- There are two classes available on CalPCA for EPP training:
 - BC 20 - Environmentally Preferable Purchasing (Basic)
 - PD developed this course to provide information, tools, and tips for state buyers on how to buy EPP or “Green” products and services.
 - EC 20 - Environmentally Preferable Purchasing for Executives
 - This class is designed to give state executives an introduction into EPP and helps give the first steps that would be needed to drive EPP from the top down in the organization.

Visit DGS website: <https://www.dgs.ca.gov/PD/Services/Page-Content/Procurement-Division-Services-List-Folder/Take-CalPCA-Classes> or go to the PD website and search for CalPCA.

Demonstration on Finding EPP Contracts:

Visit DGS, PD website: <https://www.dgs.ca.gov/PD>
Scroll down to the link to the Buying Green Guide:
<https://www.dgs.ca.gov/PD/Resources/Find-EPP-Goods-and-Services>



The screenshot shows the DGS Procurement Division website. The navigation menu includes: < DGS HOME, HOME, SERVICES, FORMS, RESOURCES, NEWS, EVENTS, ABOUT, CONTACT. A search bar is present with the text "For example, how to sell to the state?" and a "SEARCH" button. The main content area features a large image of a cityscape with the text "Buying Green Guide" and "Best Practices Buying Guide". Below this, there is a "RESOURCES" section with a link to "Find EPP Goods and Services". To the right of this link is the "BUYING GREEN" logo and a definition: "Environmentally Preferable Purchasing (EPP) is the procurement of goods and services that have a reduced impact on human health and the environment as".

Links on the left take you to contracts.

- RESOURCES**
- > **Find EPP Goods and Services**
 - > Building and Maintenance
 - > Cleaning Supplies
 - > Food
 - > Ground Maintenance
 - > Office Equipment
 - > Office Supplies
 - > Paper Products
 - > Safety
 - > Transportation

Or download the State Contracts Index Listing:

SBs and DVBEs in state procurement.

State Contracts Index Listing

The State Contracts Index Listing contains high level contract information for each contract, including links to the Cal eProcure LPA details page.

Cal eProcure

California Bid Postings and Small Business & Certification Application Online

GO TO CAL EPROCURE

CONTACT

CONNECT WITH US

And sort by Environmentally Preferable Purchasing (EPP) Compliant.

Contract Type (DGS use only)	Commodity/Service Description	Contract Number	Contractor Name	Contract Start Date	Contract End Date	Extensions Possible (Yes/No)	Mandatory (Yes/No)	State Users (Statewide/Dept Use Only)	Open to Local Agencies (Yes/No)	State Contract Administrator	Phone	Environmentally Preferable Purchasing (EPP) Compliant (Click link to access Buying Green website.)
CMAS	Please use the CMAS Search											
SC	Airplane, Fixed Wing, Turbine	1-20-15-15	CNC Technologies, LLC	4/3/2020	4/2/2025	Yes	CHP Only	Nationwide	Yes	Eileen Tardiff	(279) 946-8013	
SC	Ammunition, New Factory Loaded	1-21-13-02A	San Diego Police Equipment Co., Inc.	11/23/2021	11/22/2024	Yes	Yes	Statewide	Yes	Frank Martin	(279) 946-8035	EPP
SC	Ammunition, New Factory Loaded	1-21-13-02B	Dooley Enterprises, Inc.	11/23/2021	11/22/2024	Yes	Yes	Statewide	Yes	Frank Martin	(279) 946-8035	EPP
SC	Asphalt Concrete, Plant Mix, Delivered District 1 Area 1 Only	1-22-56-20-01A	Eagle Rock, Inc.	1/6/2022	1/5/2025	Yes	No	DOT only	No	Sallianne Salinas	(279) 946-8315	
SC	Asphalt Concrete, Plant Mix, Delivered District 1 Area 2 Only	1-22-56-20-01B	Tidewater Contractors, Inc.	1/6/2022	1/5/2025	Yes	No	DOT only	No	Sallianne Salinas	(279) 946-8315	
SC	Asphalt Concrete, Plant Mix, Delivered District 1 Area 8 Only	1-22-56-20-01E	Dan Palmer Trucking, Inc.	1/6/2022	1/5/2025	Yes	No	DOT only	No	Sallianne Salinas	(279) 946-8315	
SC	Asphalt Concrete, Plant Mix, Delivered District 1 Areas 3 and 9 Only	1-22-56-20-01C	Thomas R. Bess, Inc.	1/6/2022	1/5/2025	Yes	No	DOT only	No	Sallianne Salinas	(279) 946-8315	

Reporting web site link: <https://www.green.ca.gov/Buyer>

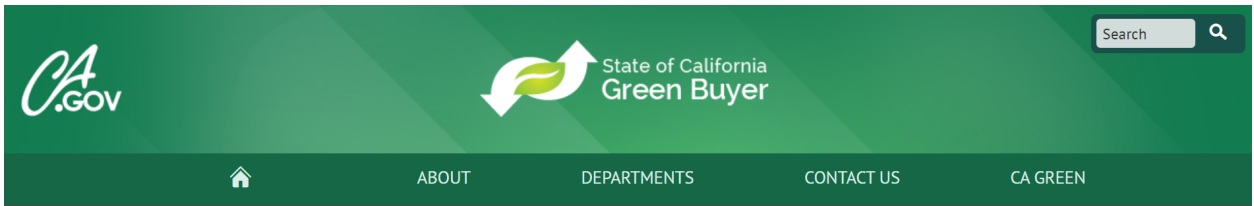


GREENING STATE PROCUREMENT

Discover state departments' progress to buy Environmentally Preferable Purchasing (EPP) goods and services. EPP purchases enhance energy



Department Page



DEPARTMENTS

- > ADMINISTRATIVE LAW, OFFICE OF
- > AFRICAN AMERICAN MUSEUM, CALIFORNIA
- > AGING, CALIFORNIA COMMISSION ON
- > AGING, DEPARTMENT OF
- > AGRICULTURAL LABOR RELATIONS BOARD
- > AIR RESOURCES BOARD
- > ALCOHOLIC BEVERAGE CONTROL APPEALS BOARD
- > ALCOHOLIC BEVERAGE CONTROL, DEPARTMENT OF
- > INDUSTRIAL DEVELOPMENT FINANCING ADVISORY COMMISSION, CALIFORNIA
- > INDUSTRIAL RELATIONS, DEPARTMENT OF
- > INSPECTOR GENERAL, OFFICE OF THE
- > INSTITUTE FOR REGENERATIVE MEDICINE, CALIFORNIA
- > INSURANCE, DEPARTMENT OF
- > JUSTICE, DEPARTMENT OF
- > LABOR AND WORKFORCE DEVELOPMENT AGENCY, CALIFORNIA

Training link: <https://www.dgs.ca.gov/PD/Services/Page-Content/Procurement-Division-Services-List-Folder/Take-CalPCA-Classes>

The screenshot shows the DGS Procurement Division website. The header includes the DGS logo, the text 'Procurement Division', and a search bar with the placeholder text 'For example, how to sell to the state?'. Below the header is a navigation menu with links for DGS HOME, HOME, SERVICES, FORMS, RESOURCES, NEWS, EVENTS, ABOUT, and CONTACT. The main content area has a breadcrumb trail: HOME > PROCUREMENT DIVISION > SERVICES > ACCESS CALPCA PROCUREMENT AND CONTRACTING COURSES. The title is 'Access CalPCA Procurement and Contracting Courses'. Below the title is a paragraph: 'State procurement professionals can sign up for California Procurement and Contracting Academy (CalPCA) courses and workshops to gain essential knowledge and improve buying skills.' There is a 'SPECIAL NOTICE!' box on the left stating that due to health concerns, in-classroom courses are canceled and will be re-scheduled, while webinar courses will proceed as scheduled. To the right of the notice, there is a paragraph explaining that state procurement professionals may enroll in CalPCA courses and workshops to gain essential knowledge and improve buying skills, and that students successfully completing courses receive certificates of completion required for their departments' delegated purchasing authority. Below this, it states that CalPCA Online, the Learning Management System, allows professionals to register for and attend CalPCA's various courses and labs to make course content more easily accessible.

After logging into the learning management system, look for “Register for Course” on the left.

The screenshot shows the CalPCA Learning Management System interface. On the left is a user profile for Mark Wriston, logged in as a Learner, with options for Dashboard, Register for Course, Withdraw from Course, Print Transcript, and Edit Account. The main area displays a search bar for courses and a 'Find Course' button. Below the search bar are three course cards. The first card is for 'BC 20 - Environmentally Preferable Purchasing', an online ongoing course with 9670 seats available, featuring an 'Enrolled' button. The second card is for 'EC 20 - Environmentally Preferable Purchasing for Executives', an online ongoing course with 9974 seats available, featuring a 'Completed' button. The third card is for 'Contract Management WEBINAR - 6/8-9/2022', an online course on June 8, 2022, with 130 seats available, featuring a 'Register' button. Below these are three more course cards: 'Basic Acquisition Certificate' with a green key icon, and two more cards with similar icons and text.

9. CalPCA Updates

Robert Ullrey, Chief Training Officer, PT&CS, PD, DGS

Courses

- “EPP for Executives” class is now available on the CalPCA Learning Management System at: <https://dgs.geniussis.com/PublicWelcome.aspx>

- Finalizing self-paced “Statement of Work” class, to be released soon.
- Self-paced “Contract Classifications” class coming soon.
 - IT and public works

Future Courses

- TACPA courses geared for vendors to understand differences in preferences
- SB/DVBE program training on TACPA



CustomIQ Research

Inflation & Commodity Trends

Zach Locy & Aidan Manley

April 2022

What's in this Report

This report contains information on twelve primary commodities. Information provided for these commodities include forecast growth rates, the impact of these primary commodities on secondary commodities, substitutes for primary commodities as well as both upstream and downstream supply chain analysis for each primary commodity.

Executive Summary

- Commodities are currently being impacted by several factors, including surging global inflation, rapidly changing demand trends and the ongoing conflict between Russia and Ukraine, which has resulted in comprehensive sanctions against many major Russian industries.
- Reactions to these events are not uniform across commodities, however. For example, aluminum, chlorine, corn and crude oil are all expected to continue increasing in price in the short term, while commodities such as lumber are expected to see drastic declines in price in the near future.
- As primary commodities are experiencing a highly volatile environment due to current global events, second commodities are subsequently being impacted. As the supply of primary commodities continues to be disrupted, extended lead times and limited availability for many secondary commodities are expected to negatively impact buyers.



Commodity Analysis

1. Aluminum

Forecast CAGRs:

- 6 Month: 2.6%
- 1 Year: 2.2%
- 2 Year: 1.4%
- 3 Year: -0.8%

Analysis: The price of aluminum is expected to increase and continue to tread close to record highs as supply continues to be disrupted as a result of the ongoing Russia-Ukraine war. However, price growth is expected to slow and ultimately begin declining as global aluminum markets adjust to this supply shock.

Secondary Commodities:

- Cameras/Cell Phones/Computers/Copiers
 - Aluminum is used in printed circuit boards, computer chips and other structural or body components of technology such as cameras, cell phones and computers. As aluminum prices continue to near record highs and exhibit high levels of volatility, these products may face upward pressure on market prices. Lead times may also be extended for some of these products.
- Canned Goods
 - Canned goods and beverage manufacturers are experiencing significant increases in prices currently, with some suppliers reporting nearly 25.0% increases in the price of cans due to widespread aluminum supply shortages.
- Vehicle/Vehicle Parts
 - Vehicle and auto part manufacturers are expecting declines in manufacturing capabilities due to shortages of aluminum. Major automobile manufacturers are slashing estimates of productive capacities for 2022. Lead times for vehicles and related part manufacturing are also expected to increase, as suppliers are forced to wait longer for shipments to arrive.

Substitute Commodities:

- Magnesium Alloys

Upstream Supply Chain:

- Alumina Producers & Processors
 - Bauxite Miners
- Mining Equipment Manufacturers

Analysis: The upstream supply chain for aluminum consists of raw material suppliers that mine bauxite, process it into alumina and deliver it to aluminum manufacturers. Recently, there has been bauxite shortages due to conflict in Guinea, a major supplier of this component.

Downstream Supply Chain:

- Car & Automobile Manufacturers
- Metal Can & Container Manufacturers

Analysis: The downstream supply chain for aluminum consists of final products and solutions engineered and built from aluminum. Major downstream players include aircraft and automobile part and equipment manufacturers, as well as canned goods and beverage suppliers.



2. Crude Oil

Forecast CAGRS:

- 6 Month: 1.3%
- 1 Year: -8.8%
- 2 Year: -4.1%
- 3 Year: -2.3%

Analysis: The price of crude oil is currently experiencing extreme volatility. This primarily stems from significant supply disruptions occurring as a result of sanctions against Russia, a major global supplier of the product. Prices are expected to continue rising in the short term; however, oil prices are projected to stabilize and begin declining in the following periods as other countries increase production and supply constraints are resolved.

Secondary Commodities:

- Diesel/Gasoline
 - Prices for gasoline and diesel are expected to continue rising as disruptions in the global market for oil persist. National averages are currently at extreme highs, at nearly \$4.20 per gallon for gasoline, and \$5.10 for diesel, with little relief expected in the near future, according to global oil executives.
- Grounds Maintenance Equipment/Heavy Equipment
 - Many types of equipment rely on lubricating oils to ensure the longevity of machines. As these products are refined from crude oil, owners of these machines can expect significant volatility in future costs associated with maintaining their equipment.
- Tires/Auto Parts
 - Oil is a primary component in tires, as well as in the manufacturing of additional auto parts. Both manufacturers and buyers of tires can expect continued increased prices and extended lead times as global rubber shortages occur alongside the extreme volatility in the market for crude oil.
- Asphalt
 - As asphalt is produced from petroleum crude oil, prices and supply depend nearly entirely on the current conditions in the global oil market. Currently, asphalt prices are surging alongside other oil-dependent products such as gasoline and diesel.
- Industrial Consumables:
 - Industrial consumables including motor and lubricating oils, paint and plastic products depend heavily on the market for crude oil, as many of these products are derived directly from oil. As volatile conditions persist in the crude oil market, supply and prices of these products are expected to shift quickly, contributing to potentially extended lead times and higher overall costs for buyers.

Substitute Commodities: N/A

Upstream Supply Chain:

- Mining, Oil & Gas Machinery Manufacturing
 - Steel Manufacturers
- Industrial Supplies Wholesalers
 - Power Tools & Other General Purpose Machinery Manufacturers
 - Pump & Compressor Manufacturers
- Metal Pipe & Tube Manufacturers
 - Steel Manufacturers



2. Crude Oil

- Iron Manufacturers

Analysis: Significant supply chain risk exists in the market for crude oil, as the market depends heavily on other risky commodities. While international sanctions on Russia have been contributing to instability in the supply chain, tariffs on global steel producers also can cause disturbances, as steel and iron are critical components of the majority of machinery used in the oil extracting process.

Downstream Supply Chain:

- Petroleum Refineries
- Gasoline & Petroleum Stations
- Petrochemical Manufacturers
- Rubber Product Manufacturers
- Plastics & Related Products Manufacturers

Analysis: Downstream demand shocks in the market can contribute to further strain on already low supply levels, and work to push prices even higher in the short-term.

3. Chlorine

Forecast CAGRS:

- 6 Month: 6.4%
- 1 Year: 4.3%
- 2 Year: 1.3%
- 3 Year: 0.7%

Analysis: The price of chlorine is expected to remain elevated over the next three years as shortages persist throughout the market. Shortages are occurring as a result of high demand, as well as a fire at a large chlorine and chemical producing plant in Louisiana in mid-2021 that has dramatically reduced the national supply.

Secondary Commodities:

- Pharmaceutical Products
 - As chlorine shortages linger and prices continue to rise, pharmaceutical products and medicines that use chlorine as components are expected to increase in price as well. Prices are anticipated to face further upward pressure as demand from water treatment facilities prompt suppliers to raise chlorine prices further.

Substitute Commodities:

- Bromine

Upstream Supply Chain:

- Chemical Product Manufacturers
 - Inorganic Chemical Manufacturers
- Mineral & Phosphate Miners
 - Mining Equipment Manufacturers

Analysis: The primary upstream supply chain risk for chlorine stems mostly from the ability for chemicals to be processed and produced. A significant disruption in the supply chain has occurred as a result of the fire at a Louisiana chlorine plant in 2021.

Downstream Supply Chain:

- Pharmaceutical Manufacturers
- Chemical Product Wholesalers



3. Chlorine

- Facility Maintenance Providers

Analysis: Demand from downstream suppliers is steady on average as the major buyers in the market require the product at a regular, predictable pace in order for operations to continue.

4. Corn

Forecast CAGRS:

- 6 Month: 2.4%
- 1 Year: 4.0%
- 2 Year: -0.7%
- 3 Year: -0.5%

Analysis: Farmers are anticipated to cut back on the amount of corn planted as fertilizer prices surge. In light of expected low supply levels, corn prices are projected to increase over the next year. Supply shortages are also expected to occur as Russian and Ukrainian production falls, which currently accounts for around 20 - 30% of world supply. Prices further into the forecast period are expected to begin declining from these near-record highs as supply constraints resolve.

Secondary Commodities:

- Animal Feed/Products
 - As corn is a major component of the typical animal feed used by farmers, increases in corn prices are negatively impacting cattle and livestock owners. As animal feed prices continue to rise, farmers are expected to raise prices of these animal products in order to cover rising costs, thereby contributing to upward pressure on various food prices including beef and dairy.

Substitute Commodities:

- Barley & Other Grains
- Rice

Upstream Supply Chain:

- Fertilizer Manufacturers
 - Chemical Product Manufacturers
- Farm Product Storage & Warehousing Providers
- Tractors & Agricultural Machinery Manufacturers
 - Steel Manufacturers
- Water Supply & Irrigation Providers
 - Pipe & Tube Manufacturers

Analysis: Major supply chain disruptions can result from fluctuations in the price or availability of fertilizer. In cases where fertilizer becomes abnormally expensive or difficult for farmers to procure, farmers often switch to crops which depend less heavily on fertilizer, including soybeans, which can reduce the overall supply of corn.

Downstream Supply Chain:

- Animal Feed Producers
- Food & Grocery Stores
- Fruit & Vegetable Markets

Analysis: Downstream demand is steady, however there are many substitutes available to consumers and farmers alike, reducing the impact of any demand shocks in the market.



5. Lumber

Forecast CAGRS:

- 6 Month: -6.4%
- 1 Year: -19.1%
- 2 Year: -12.6%
- 3 Year: -9.8%

Analysis: The price of lumber is expected to decline consistently over the next three years, falling from extreme highs that occurred during both the peak of the pandemic as well as early 2022. Lumber prices are expected to decline steadily over the next three years as supply from lumber producers catches up to demand, following periods of extremely high demand due to increased home and residential construction projects.

Secondary Commodities:

- Toilet Paper
 - As lumber shortages begin to resolve and prices decline over the following three years, the price of toilet paper and other products that depend on wood pulp are expected to decline. Residual shortages of toilet paper from pandemic-related supply disruptions are expected to resolve over this period.

Substitute Commodities:

- Metals/Steel
- Concrete/Asphalt
- Plastics

Upstream Supply Chain:

- Tools & Hardware Wholesalers
 - Tools & Hardware Manufacturers

Analysis: Upstream supply chain risk primarily stems from the availability of wood and lumber to be cut and sold. Weather events or wildfires can reduce the overall stock of lumber and contribute to higher prices.

Downstream Supply Chain:

- Hardware Stores
- Commercial Building Construction
- Residential Building Construction
- Municipal Building Construction
- Lumber & Building Material Stores

Analysis: Downstream demand fluctuates widely in this market depending on outside economic factors, including the interest rate. Should the interest rate suddenly spike, builder sentiment is expected to decrease, contributing to sudden reductions in demand of lumber.



6. Natural Gas

Forecast CAGRS:

- 6 Month: 1.4%
- 1 Year: -10.2%
- 2 Year: -8.0%
- 3 Year: -6.3%

Analysis: Natural gas prices are expected to remain highly volatile in the near future, with uncertainty contributing to upward pressure on prices in the following six months. Prices are anticipated to begin declining in the following periods as domestic production increases in response to higher global demand and rising exports.

Secondary Commodities:

- Equipment
 - Equipment such as generators depend on natural gas in order to operate and generate electricity. Owners of these generators, including large facilities, universities and other buildings, can expect to face operating cost increases in the short term. However, as natural gas supply becomes more abundant as global production is increased, these costs are expected to begin to fall.

Substitute Commodities:

- Propane
- Biofuel
- Coal

Upstream Supply Chain:

- Mining, Oil & Gas Machinery Manufacturing
 - Steel Manufacturers
- Industrial Supplies Wholesalers
 - Power Tools & Other General Purpose Machinery Manufacturers
 - Pump & Compressor Manufacturers
- Metal Pipe & Tube Manufacturers
 - Steel Manufacturers
 - Iron Manufacturers

Analysis: Supply chain disruptions stem both from drilling sites yielding low amounts of gas and from fluctuations in markets for steel and iron, as these metals make up a significant portion of the machinery required to drill for natural gas.

Downstream Supply Chain:

- Coal & Natural Gas Power Providers
- Fuel Dealers
- Fertilizer Manufacturers

Analysis: Downstream demand for natural gas is steady; however, as shifts toward green energy occur in the future, demand shocks may become more likely.



7. Oats

Forecast CAGRS:

- 6 Month: -1.7%
- 1 Year: -2.5%
- 2 Year: -0.1%
- 3 Year: 0.3%

Analysis: The price of oats increased by over 80.0% over the course of 2021 due to droughts that reduced the overall supply of oats in the market amid increasing global demand. These events in turn have pressured prices upwards. However, over the next three-year period, increasing production will pressure prices downwards in line with historical price trends.

Secondary Commodities:

- Animal Feed & Products
 - Oats are used as a key ingredient in animal feed for horses, cattle, sheep, pigs and poultry. The rising price of oats has subsequently lifted prices for these products in 2021, and farmers have passed on these costs to consumers. Nonetheless, the decreasing price of oats should reduce purchases as a percentage of revenue for the farming industry.
- Granola & Baked Goods
 - Many baked goods and granola are typically derived from oats. The fluctuating price of oats directly contributes to rising prices of granola and granola-products. However, decreasing prices over the forecast period should pressure commodity prices downwards.

Substitute Commodities:

- Chia Seeds
- Quinoa
- Brown Rice
- Buckwheat

Upstream Supply Chain:

- Fertilizer Manufacturers
 - Chemical Product Manufacturers
- Farm Product Storage & Warehousing Providers
- Tractors & Agricultural Machinery Manufacturers
 - Steel Manufacturers
- Water Supply & Irrigation Providers
 - Pipe & Tube Manufacturers

Analysis: Drought conditions in 2021 have pushed oat harvests in North America close to record low levels. Canada a top supplier of oats in the United States and the world's largest producer of oats, harvested its smallest oat crop in over a decade. In addition, imports from Canada suffered from washed out rail lines in British Columbia and a subsequent cold snap inhibited oats shipments.

Downstream Supply Chain:

- Grocery Wholesalers
- Supermarkets & Grocery Stores
- Granola Producers
- Oatmeal Producers



7. Oats

- Oat Milk Producers
- Baked Goods

Analysis: Downstream buyers of oats products, such as the oat milk producer Oatly, have raised prices as a result of the oat shortage. The Financial Times breakfast indicator, which calculates futures prices for breakfast commodities such as coffee, milk sugar, orange juice and oats, has increased over 26.0% since mid-year of 2021 due to inflationary pressures.

8. Plastic

Forecast CAGRS:

- 6 Month: 5.2%
- 1 Year: 2.2%
- 2 Year: 2.2%
- 3 Year: 2.3%

Analysis: Propane, a derivative of crude oil, is used to make ethylene and propylene, which are the foundational building blocks of plastic manufacturing. The Russian invasion of Ukraine has caused the world price of oil to rise rapidly, placing upward pressure on plastic prices early in the forecast period. As oil prices decline over the next three years, these effects should dampen moving further into the outlook period.

Secondary Commodities:

- Medical Equipment
 - Plastic is a key input for medical equipment and it is used in vials, beakers, implants and medical instruments. Demand for plastic medical equipment is projected to increase, as plastic materials offer buyers a more cost-effective solution to alternatives such as metals, glass and ceramics.
- Disposables and Polystyrene Foam
 - Disposables bottles and bags are reliant on plastic, so increases in prices of plastic directly impact prices for these goods. Polystyrene foam is also a plastic-based product that is used in packaging as well as automobile parts.
- PVC Pipes
 - PVC pipes are plastic-based products that are often used for sewage pipes and in water mains for irrigation.
- Consumer Electronics
 - Smartphones and other consumer electronics use a wide variety of plastic products, including Polycarbonate (PC), Acrylonitrile Butadiene Styrene (ABS), and Polymethyl Methacrylate (PMMA). These plastics are used for display frames, haptic feedback cushioning and mounting frames, among other purposes.

Substitute Commodities:

- Paper & Paperboard
- Bioplastics
- Glass
- Platinum Silicone
- Ceramics

Upstream Supply Chain:

- Petrochemical Manufacturers



8. Plastic

- Petroleum Refiners
- Industrial Machinery & Equipment Wholesalers
 - Steel Manufacturers
 - Iron Manufacturers
- Inorganic & Organic Chemical Manufacturers
 - Steel Manufacturers
- Resin Producers
 - Coal Miners

Analysis: In late 2021, a southern ice storm in the United States lowered production levels of resins, a key input for plastic manufacturing, causing price increases of 30% to 50%. Petrochemicals such as ethylene and propylene are key inputs for plastic manufacturing and are produced from propane and butane, both of which derive from crude oil refining. Thus, increases in oil prices in 2022 have pressured prices upwards for plastics manufacturers, prompting some suppliers in this market to lower production due to increasing costs.

Downstream Supply Chain:

- Plastic Bottle Manufacturers
- Plastic Film, Sheet & Bag Manufacturers
- Plastic Pipe & Part Manufacturers
- Urethane Foam Manufacturers
- Plastic Product Wholesalers
- Plastic Toys
- Adhesive Manufacturers

Analysis: Rising costs in resin and oil, and thus plastic, have pushed prices higher for plastic-based products, including plastic containers, bags and bottles. The price of polyolefins, which are used in a wide variety of products, including clothing, carpet and roofing materials, is also rising.

9. Semiconductors

Forecast CAGRS:

- 6 Month: 9.8%
- 1 Year: 1.6%
- 2 Year: 1.5%
- 3 Year: 1.4%

Analysis: Rising logistics prices, pandemic-induced shortages and high demand have pressured prices of semiconductors upwards throughout the past three-year period. The rate of price increases is anticipated to decrease over the next three-year period as production increases, although prices will most likely not return to pre-pandemic levels as supply chain shortages are expected to persist.

Secondary Commodities:

- Cell Phones
 - Cell phones were largely shielded from semiconductor shortages throughout much of the past three-year period, as suppliers had reserved capacity for critical components and did not cancel orders of semiconductor chips at the start of the pandemic as other industries had done. While major players in this market have largely insulated themselves from semiconductor shortages, smaller vendors such as Lenovo and TCL



9. Semiconductors

have struggled to keep up with supply without such semiconductor chips in their reserves.

- Computers, Copiers, Web Cameras and Smartboards
 - The rise in demand for consumer electronics, including laptops and desktop computers, ultimately led to a major shortage of products that has caused backlogs. While semiconductor chip manufacturers predicted a 5.0% increase in sales in 2020, sales totaled 29.7% from August 2020 to August 2021.
- Vehicles
 - Car companies of all sizes have been impacted by the semiconductor chip shortage, forcing many to limit the number of features added to certain vehicles due to the lack of chips. However, the limiting effects of computer chips on the automobile industry are anticipated to wane throughout the forecast period, as automobile manufacturers anticipate a return to pre-pandemic levels of production.

Substitute Commodities: N/A

Upstream Supply Chain:

- Semiconductor Machinery manufacturers
 - Steel Manufacturers
 - Iron Manufacturers
 - Aluminum Manufacturers
- Copper Rolling, Drawing & Extruding Suppliers
 - Copper Miners
- Chemical Product Manufacturers
 - Silicon Suppliers

Analysis: Silicon production has slowed down in the three-year period to 2022, despite increasing demand for digital products during and post-pandemic from employers and consumers alike. In an effort to switch to cleaner energy, the world’s leading supplier of silicon, China, has aimed to reduce its consumption of coal by rationing the electricity use of industrial suppliers, including silicon suppliers. This rationing, in combination with the pandemic which continues to impact Chinese manufacturers, has ultimately limited the supply of silicon and thus semiconductors available on the global market.

Downstream Supply Chain:

- Consumer Electronics Stores
- Computer Manufacturers
- Wireless Telecommunication Manufacturers
- Automobile Electronics Manufacturers

Analysis: The global chip shortage has limited the production of electronic consumer goods and vehicles, pressuring prices upwards for these goods. In addition, while the supply of semiconductor chips is anticipated to increase over the next three-year period, buying lead times and shortages will differ, as more complex and advanced semiconductors will not be as readily available or produced compared to those with simpler components.



10. Soybeans

Forecast CAGRS:

- 6 Month: 1.4%
- 1 Year: -6.0%
- 2 Year: -2.6%
- 3 Year: -1.4%

Analysis: The world price of soybeans soared in 2021 due to droughts, fertilizer shortages and supply chain disruptions in 2020 and 2021 that reduced the supply of soybeans amid heightened demand. As supply chain disruptions ease and production increases, soybean prices are forecast to fall in line with historical trends.

Secondary Commodities:

- Animal Feed
 - Soy meal, which is used in animal feed, increased by over 20.0% in 2021.
- Nutrition
 - The price of soy oil, which is used in many food products and as a cooking oil, increased by over 40.0%. Soy-based food products, such as soy milk, tempeh and meat substitutes, also increased in price.
- Biodiesel
 - About one-third of all soybean production in the United States is used to produce biofuel. The price of biodiesel thus skyrocketed in 2021 and are projected to continue increasing in 2022, which has been attributed to the rising costs of vegetables, like soybean, and other raw materials.
- Industrial Consumables
 - Industrial consumables such as concrete sealant, engine oil and asphalt rejuvenators all rely on the oil produced by soybeans.

Substitute Commodities:

- Canola Seeds
- Sunflower Seeds
- Corn

Upstream Supply Chain:

- Fertilizer Manufacturers
 - Chemical Product Manufacturers
- Farm Product Storage & Warehousing Providers
- Tractors & Agricultural Machinery Manufacturers
 - Steel Manufacturers
- Water Supply & Irrigation Providers
 - Pipe & Tube Manufacturers
- Shipping Containers
 - Steel Manufacturers

Analysis: As with many other industries, soybean farmers and producers are struggling to obtain containers to export their products to buyers. Unlike with other grains such as corn and sorghum which move in bulk vessels, the supply of distilled grains has been constrained by the shortage of containers.

Downstream Supply Chain:

- Animal Food Producers



10. Soybeans

- Margarine & Cooking Oil Processors
- Meat Producers
- Soy-Based Food & Beverage Producers

Analysis: Over three-quarters of all world soy bean production goes to meat and dairy producers in the form of animal feed for livestock. Price increases of soy and soymeal has most impacted the meat and dairy industry, which has passed on these price increases onto consumers.

11. Steel

Forecast CAGRS:

- 6 Month: -17.9%
- 1 Year: -1.7%
- 2 Year: -9.7%
- 3 Year: -3.8%

Analysis: The world price of steel is anticipated to fall significantly over the next three years, and U.S. manufacturers are set to increase steel production to satisfy downstream demand. This should alleviate upward pressure on prices caused by the shortage of steel over the last three-year period which caused the price of steel to rise 200% in 2021 alone. Nonetheless, China, the world's largest producer of steel, has recently implemented new lockdown measures related to the coronavirus pandemic, inhibiting the production of steel and adding greater uncertainty to price forecasts for this commodity.

Secondary Commodities:

- Grounds Maintenance Equipment
 - Grounds maintenance equipment, such as shears, are made of hardened carbon or chromium steel.
- Heavy Equipment
 - Steel is the backbone for scaffolding, cranes, bulldozers and other heavy equipment.
- Industrial MRO Supplies
 - Rising steel prices have placed upward pressure on prices for repair tools and safety equipment.
- Medical Equipment
 - Medical equipment includes a wide-range of steel products, such as medical carts, wheelchairs, hospital beds, IV stands, surgical tools, medical syringes and needles, surgical screws and plates among a host of other steel-based products.
- Vehicle & Vehicle Parts
 - The Russian invasion of Ukraine is further amplifying steel prices for vehicle and vehicle parts manufacturers, as the price of nickel has crossed the \$100,000 per ton level for the first time.

Substitute Commodities:

- Aluminum
- Wood
- Stone
- Concrete
- Plastic

Upstream Supply Chain:

- Iron Ore Miners



11. Steel

- Copper, Nickel, Lead & Zinc Miners
- Industrial Machinery & Equipment Manufacturers
 - Steel Manufacturers
- Utilities & Energy Providers
 - Coal Miners

Analysis: Upstream supply for steel consists of coal miners and utilities providers that provide fuel for steel production and metal casting. While main inputs such as iron ore are not expected to experience iron shortages, the main driver of price increases in this market stem from transportation costs, as well as increased demand of steel with less post-pandemic production.

Downstream Supply Chain:

- Constructors
- Metal Pipe & Tube Manufacturers
- Car & Automobile Manufacturers
- Steel Rolling & Drawers
- Ferrous Metal Foundry Products

Analysis: Downstream demand for steel includes products and services that rely on steel and steel-based products as a key input. This includes industrial and construction markets that use steel in heavy equipment and structures, such as for ship building, oil and gas refining and vehicle production.

12. Wheat

Forecast CAGRS:

- 6 Month: 4.5%
- 1 Year: -2.0%
- 2 Year: -0.6%
- 3 Year: -0.1%

Analysis: While the Russian invasion of Ukraine may raise wheat prices earlier in the forecast period, increased production over the long-term is expected to steadily decrease the price of wheat. Increased production from Argentina and the EU, combined with decreased demand for wheat as feed use due to its comparatively higher price when compared to other grains, will pressure prices downwards over the next three-year period.

Secondary Commodities:

- Animal Feed & Products
 - Wheat is often used in swine and poultry feed, with over 50.0% of all grain production in the United States going to animal feed (while globally 40.0% of grain goes to animal feed). Nonetheless, price increases for animal feed are generally more impacted by rising corn and soybean prices.
- Nutrition
 - The Russian invasion of Ukraine has impacted exporting of wheat, while increasingly high freight rates and weather events have all contributed to higher prices for wheat-based food products, such as bread. The shortage of wheat is expected to push prices higher in 2022, although prices are anticipated to decline over the forecast period to the benefit of buyers.



12. Wheat

Substitute Commodities:

- Millet
- Quinoa

Upstream Supply Chain:

- Fertilizer Manufacturers
 - Chemical Product Manufacturers
- Farm Product Storage & Warehousing Providers
- Tractors & Agricultural Machinery Manufacturers
 - Steel Manufacturers
- Water Supply & Irrigation Providers
 - Pipe & Tube Manufacturers

Analysis: Supply chain risk for wheat stems from increasing fertilizer prices, which are pushing prices for wheat higher, as well as droughts and dry weather conditions that have limited the production of wheat. Fertilizer price increases have also been linked with suppliers failing to adjust production levels to account for increased demand.

Downstream Supply Chain:

- Cereal Producers
- Bread Producers
- Animal Food Producers
- Cookie, Cracker & Pasta Producers
- Flour Millers

Analysis: Russia is the world's largest exporter of wheat and exports more than 20 million tons per year. With the Russian invasion of Ukraine, however, many countries are suspending imports of wheat. This will increase demand for U.S. wheat and limit the domestic supply of wheat, pressuring prices upwards for food products in the United States, including bread, pasta and other wheat-based products.