Booklet

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English

Overview

BENJAMIN GRANT

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HARVEST

1 *Flower Bulbs — Netherlands*
52.724169°, 5.641978°

Farms in the province of Flevoland, Netherlands specialize in the growth of flower bulbs. Flevoland was created by the Zuiderzee Works — a coordinated reconstruction of dams and dikes, land reclamation, and water drainage. The reclaimed land now covers 970 square kilometers (375 square miles), making Flevoland the largest artificial island in the world.

2 *Deforestation — Bolivia*
-17.387750°, -60.562130°

Deforestation of the rainforest is visible in Santa Cruz, Bolivia — immediately adjacent to untouched tracts of forest. Deforestation in the country has primarily been driven by the expansion of mechanized agriculture and cattle ranching. This Overview highlights the country's struggle to expand food production in order to meet the needs of its growing population and the sacrificial destruction of its forests that has taken place to do so. While deforestation rates are now relatively stable at about 200,000 hectares (494,000 acres) a year, it is estimated that Bolivia lost 1,820,000 hectares (4.5 million acres) of forests from 2000 to 2010.

3 *Deforestation — Brazil*
-3.792333°, -53.868947°

Clearcutting operations in the Amazon Rainforest of Para, Brazil branch out from one of the state's central roads. Deforestation of the Amazon accelerated significantly between 1991 and 2004, reaching its highest annual forest loss rate of 27,423 square kilometers (10,588 square miles) in 2004. Though the rate of deforestation has been slowing since, the remaining forest cover still continues to decrease. The Amazon represents over half of the planet's remaining rainforests, and accounts for the most biodiverse tract of tropical rainforest in the world.

4 *Pivot Irrigation Fields — Saudi Arabia*
30.089890°, 38.271806°

Centre pivot irrigation is used throughout the Wadi As-Sirhan Basin of Saudi Arabia. Water is mined from depths as great as 1 kilometer (0.6 miles), pumped to the surface, and evenly distributed by sprinklers that rotate 360 degrees. Spurred by a government effort to strengthen its agricultural sector, cultivated land in Saudi Arabia grew from 162,000 hectares (400,000 acres) in 1976 to more than 3.2 million hectares (8 million acres) by 1993.

5 *Vineyards — Germany*
49.837462°, 6.825530°

Vineyards surround the Moselle River in the Trier-Saarburg district of Germany. The region is recognized for its production of Riesling wines with 9,000 hectares of land (roughly the size of Manhattan in New York City) dedicated to grape growing.

6 *Cotton — Sudan*
14.500005°, 33.164478°

The Gezira Scheme is one of the largest irrigation projects in the world, situated at the confluence of the Blue and White Nile Rivers near the city of Khartoum, Sudan. Because the soil slopes away from the rivers, water naturally flows through 4,350 kilometers (2,700 miles) of irrigation canals with gravity. The primary crop cultivated here is cotton.

7 *Agricultural development — Austria*
48.181684°, 16.731172°

Agricultural development surrounds the Austrian villages of Straudorf and Fuchsenbigl. Of Austria's total area of almost 84,000 square kilometers, approximately 67,000 square kilometers are used for farming and forestry.

8 *Agricultural development — Ethiopia*
8.904953°, 38.869170°
Agricultural development is seen on the outskirts of Addis Ababa, Ethiopia. Both the capital and the largest city in the country, Addis Ababa has a population of approximately 3.4 million. Despite the significant role urban agriculture has played in the history of the city, this activity is facing challenges due to rapid urbanization and the subsequent competitive demand for land.

9 *Pivot Irrigation Fields — U.S.A*
39.345868°, -101.715965°
Centre pivot irrigation fields cover the landscape surrounding Goodland, Kansas, USA. The circles that you see here are created when lines of sprinklers, powered by electric motors, rotate 360 degrees to evenly irrigate crops.

10 *Plasticulture — Spain*
36.715441°, -2.721485°
Greenhouses — also known as plasticulture — cover approximately 20,000 hectares of land (50,000 acres) in Almeria, Spain. The use of plastic covering is designed to increase produce yield and size, and shorten growth time.

11 *Plasticulture — Italy*
44.060755°, 8.210413°
The economy of Albenga, Italy is primarily driven by tourism and agriculture. When viewing the town from above, it's easy to see the amount of space dedicated to agriculture because of the widespread use of greenhouses or "plasticulture." The use of plastic covering is designed to increase produce yield, increase produce size, and shorten growth time.

12 *Olives — Spain*
37.263212°, -4.552271°
Olive tree groves cover the hills of Cordoba, Spain. Approximately 90% of all harvested olives are turned into oil; the remaining 10% are eaten as table olives. With rising temperatures and phenomenal weather variations in growing regions, olive groves on high hills or slopes will probably suffer less, but groves located on low altitude areas or plains could become totally unproductive.

13 *Cattle Feedlot — U.S.A.*
34.715427°, -102.507400°

Cattle are visible at a feedlot in Summerfield, Texas, USA. Once the animals reach a weight of 295 kilograms (650 pounds), they are moved to these facilities and placed on a strict diet of specialized animal feed. Over the next three to four months, the cows gain up to 180 kilograms (400 pounds) before they are shipped off to slaughter. The lagoon seen at the top of this feedlot gets its glowing color from manure, and the presence of algae that grows in the stagnant water.

14 *Tulips — Netherlands*
52.276355°, 4.557080°

Every year, tulip fields in Lisse, Netherlands begin to bloom in March and are in peak bloom by late April. The Dutch produce a total of 4.3 billion tulip bulbs each year, of which 53% (2.3 billion) is grown into cut flowers. Of these, 1.3 billion are sold in the Netherlands as cut flowers and the remainder is exported: 630 million bulbs to Europe and 370 million elsewhere.

15 *Aquaculture — China*
26.408924°, 119.741132°

Seafood farms cover the surface of Luoyuan Bay in the Fujian province of China. Underneath the water is a vast network of lines, cages, and nets for the growth of various seafood species including crabs, lobsters, scallops, and carp.

16 *Rice Paddies — China*
23.126262°, 102.751508°

Terraced rice paddies cover the mountainsides of Yuanyang County, China. Cultivated by the Hani people for the last 1,300 years, the slope of the terraces varies from 15 to 75 degrees, with some having as many as 3,000 steps. Approximately 4 square kilometers (1.5 square miles) of paddies are seen here surrounding the small village of Tuguozhai.

17 *Algae — Australia*
-28.172005°, 114.261002°

Hutt Lagoon is a massive lake in Western Australia that gets its color from a particular type of algae, *Dunaliella salina*. The lagoon contains the world's largest microalgae production plant, where the algae is farmed for its beta-carotene (used as a food-colouring agent and source of Vitamin A).

18 *Pig Farms — USA*
38.2319721°, -113.104963°

A massive pig farm is visible in Milford, Utah, USA. Located in an arid, desert climate, the facility covers more than 35 miles. It is estimated that the farm raises and markets 1.2 million hogs every year — a number that is about 185 times larger than the human population of the county where the farm is located.

19 *Agricultural development — Germany*
52.665836°, 9.480028°

Fields surround the residential area of Rodewald, Germany. The agricultural village was first mentioned in historical records from the early 13th Century and is now home to 2,549 people.

WASTE

20 *Alang Shipbreaking Yard — India*
21.406714°, 72.193885°

The shipbreaking yards on the Arabian Sea in Alang, India account for approximately half of all ships salvaged around the world. The Seawise Giant — the longest ship ever built, extending 458.5 meters (1,504 feet) — was taken here to be scrapped in 2009. Ships are sold to shipbreaking companies here, brought to the shore at high tide, and are purposefully beached as the water recedes. Once the ships are anchored to the beach, they are taken apart by a massive force of migrant laborers. Human rights advocates have called attention to the abysmal conditions that these workers face on a daily basis in the yards amid explosions, perilous machinery, and toxic fumes.

21 *Mining Waste Disaster — Brazil*
-20.237096°, -43.421697°

On 5 November 2015, two dams collapsed at an iron ore mine in southeastern Brazil. News outlets estimated that approximately 62 million cubic meters (81 million cubic yards) of toxic waste water was unleashed. The immediate release of sludge wiped out the village of Bento Rodrigues, resulting in the death of 17 people. Because of this pollution, more than half a million people did not have access to clean drinking water or water to irrigate crops for an extended period of time. Furthermore, within two weeks of the dam rupture, the contaminated waters had spread across a 644-kilometer (400-mile) stretch of the Doce River and entered into the Atlantic Ocean, killing significant amounts of plant and animal life along the way. Officials are concerned that the toxins will continue to threaten the Comboios Nature Reserve, a protected area for the endangered leatherback turtle.

22 *Athabasca Tar Sands Waste Ponds — Canada*
57.013932°, -111.662197°

Of Canada's total reserves of 173 billion barrels of oil, 168 billion are located in the Athabasca Tar Sands. Large volumes of tailings are produced and pumped into massive tailing ponds at the facility as a byproduct of bitumen extraction (semisolid petroleum). In 2013, a government report stated that tailings ponds in the oil sands covered an area of nearly 77 square kilometers (30 square miles).

23 *Sudokwon Landfill — South Korea*
37.575339°, 126.612551°

The Sudokwon Landfill is the destination of nearly all of the waste generated by the 22 million people and happenings in the metropolitan area of Seoul, South Korea. One of the landfill's two sections is filled to capacity, enabling its top layer of land to be converted into a golf course. For the active landfill section, city and local administrators are conflicted about whether or not to continue adding more waste to the site. Even though there is more space to fill, many believe the facility poses significant environmental risks and creates foul odors that seep into the surrounding residential areas. Because there is no existing alternative to collect the city's waste, the 2016 date when officials intended to close the facility has been delayed and indefinitely extended.

24 *Fresno-Clovis Wastewater Treatment Facility — USA*
36.699766°, -119.903360°

Every day, this facility in Fresno, California, USA receives 268 million liters (71 million gallons) of wastewater that is routed to the facility through 2,400 kilometers (1,500 miles) of sewer lines. During the purification process, the wastewater is pumped into the large pools seen in this Overview. Here, any material that was not removed during earlier screening processes will either float to the surface or settle at the bottom of the basins.

25 *Red Mud Pond — USA*
30.157888°, -90.906310°

A red mud pond is visible in Darrow, Louisiana, USA. Approximately 77 million tonnes of red mud, also known as red sludge, is generated every year due to the industrial production of aluminum around the world.

26 *Victorville Airplane Boneyard — USA*
34.611367°, -117.379784°

The Southern California Logistics Airport in Victorville, California, USA contains an aircraft boneyard with more than 150 retired planes. Because the demand for jumbo jets has dropped significantly in the last two decades in favor of smaller, more affordable twin-engine planes, many large aircrafts have been retired. The dry conditions in Victorville — located on the edge of the Mojave Desert — limits the corrosion of metal, meaning planes can be stored here for years while they are stripped for spare parts.

27 *IJsseloog — Netherlands*
52.599113°, 5.741851°

IJsseloog is an artificial island used as a depository to store polluted silt in the middle of the IJssel River in Flevoland, Netherlands. Silt is granular material, smaller than sand but larger than clay, and may occur as soil or as sediment mixed in suspension with water. IJsseloog can hold 20 million cubic meters (706 million cubic feet) of silt.

28 *Colorado Tire Graveyard — USA*
40.177084°, -104.684722°

The world's largest tire dump is located in Hudson, Colorado, USA. The facility contains 15-meter-deep (50-foot) pits filled with approximately 60 million scrap tires. An estimated 1.5 billion tires are discarded each year worldwide. Of that amount, more than half are burned for their fuel.

29 *Umi No Mori — Japan*
35.596614°, 139.806126°

In Tokyo Bay, Japan, there is an island built on top of 12.3 million tonnes of municipal waste, buried there from 1973 to 1987 — primarily waste from Tokyo's water purification plants, sewage, city parks, and streets. In recent years, an ambitious environmental project called Umi No Mori has been enacted to convert much of the landfill area into a "sea forest", with half a million trees planted across 88 hectares (217 acres). The organizers hope the project serves as a symbol of human beings striving to live in harmony with nature.

30 *Tolk Coal-Fired Power Station — USA*
34.195475°, -102.573681°

Tolk Station is a coal-fired, steam-electric power plant near Sudan, Texas, USA. Coal-fired plants produce electricity by burning coal in a boiler in order to produce steam. The steam then flows into a turbine, which spins a generator to create electricity. The steam is then cooled, condensed back into water, and returned to the boiler to start the process over. The sludge and contaminated water produced during these processes at Tolk Station are dumped into the waste ponds seen here.

31 *Thilafushi — The Maldives*
4.182612°, 73.440497°

Thilafushi is an artificial island built from reclaimed land that receives all of the waste generated in the Maldives. It is estimated that 330 tonnes of waste is brought to Thilafushi every day, most of which comes from Malé. Because the waste is used to continue the land reclamation process and increase the size of the island, the area of Thilafushi is growing at 1 square meter (11 square feet) each day.

32 *Ordos Ghost City — China*
39.599654°, 109.780476°

Ordos, China is considered by many accounts to be the largest ghost city in the world. In the last decade, construction projects increased the housing and population capacity of the city to more than 1 million people. However, reports as of 2016 suggest that only 2% of the new buildings have been occupied and many of the city's other construction projects have been abandoned. The Kangbashi New Area, seen here, contains many of the city's new, modern-designed cultural attractions, but noticeably, very few cars.

EXTRACT

33 *Oil Wells — USA*
31.500359°, -96.293046°

Hundreds of oil wells are visible in the areas surrounding Donie, Texas, USA. The machines used here are primarily pumpjacks, a machine that mechanically lifts liquid out of an oil well if not enough pressure exists for the liquid to flow all the way to the surface. This area has also become a popular spot for hydraulic fracking, a complex and controversial process where oil or gas is extracted from shale rock. Environmental advocates believe these operations have serious consequences for groundwater contamination, wastewater pollution, and air pollution.

34 *Soquimich Lithium Mine — Chile*
-23.481939°, -68.333027°

The Soquimich Lithium Mine is located in the Atacama Desert of Chile. With no historical record of rainfall in parts of the region, it is considered to be one of the driest places on Earth. Mineral-rich brines are pumped via underground wells into large, shallow ponds that are colored to speed up the evaporation process. The subsurface brines of the Atacama are particularly rich in lithium salts, an essential component of batteries and some medicines.

35 *Lop Nur Potash Evaporation Ponds — China*
40.445902°, 90.833588°

The Lop Nur Potash Ponds are located in the Taklimakan Desert of China. The area is a dismal location for agricultural activity, yet the sandy landscape is rich with potash — a form of potassium salt that is a major nutrient for plant growth and a key ingredient in fertilizers. The salts are pumped to the surface from underground brines and dried in massive solar ponds that stretch across the landscape for more than 21 kilometers (13 miles). The bright colors that are seen in this Overview occur because the water is dyed blue, as darker water absorbs more sunlight and heat, thereby reducing the amount of time it takes for the water to evaporate and the potash to crystallize.

36 *Manifa Oilfield — Saudi Arabia*
27.639937°, 49.030375°

Pumping facilities are constructed on artificial islands above the Manifa Oilfield in Saudi Arabia. The field is considered to be the fifth largest in the world with a pumping capacity of 900,000 barrels of crude oil per day. Due to the shallow water location of the field, access to offshore drilling rigs would not have been possible without extensive dredging. Accordingly, a 21-kilometer (13-mile) causeway with 25 offshoot islands was constructed with 40 million cubic meters (52 million cubic yards) of sand and 10 million tonnes of rock. Each drilling island, approximately 340 meters by 260 meters in size (1,100 feet by 850 feet), serves as a platform to extract oil from beneath the surface.

37 *San Francisco Bay Salt Ponds — USA*
37.504215°, -122.036887°

A recent figure estimates that 80% of the San Francisco Bay wetlands area in California, USA — approximately 6,700 hectares (16,500 acres) — has been developed for salt mining. Water is channelled into large ponds and exits through natural evaporation. The salt that remains can then be collected. The massive ponds get their vibrant colors from the algae that live there and the species' tolerance to salinity.

38 *Tagebau Hambach Surface Mine — Germany*
50.911368°, 6.547357°

Bucket-wheel excavators run on tracks at the Tagebau Hambach open-pit mine in Etzweiler, Germany. These massive vehicles — considered to be the largest land machines in the world at 96 meters (315 feet) tall and 223 meters (730 feet) long — continuously scoop materials from the surface in order to extract lignite. Lignite, often referred to as 'brown coal', is a soft, combustible sedimentary rock that is formed from naturally compressed peat and is used as a fuel for steam-electric power generation.

39 *Bingham Canyon Mine — USA*
40.523000°, -112.151000°

The Bingham Canyon Mine is an open-pit mine located southwest of Salt Lake City, Utah. The mine has been operational since 1906 and has resulted in the creation of a pit over 0.6 miles deep, 2.5 miles wide, covering 1,900 acres, being the largest man made excavation in the world. The Environmental Protection Agency in the United States has estimated a 72 mile plume of contaminated groundwater has been created over the course of the mine's history due to numerous chemical and oil spills at the site.

40 *Jwaneng Diamond Mine — Botswana*
-24.523050°, 24.699750°

The Jwaneng Diamond Mine in Botswana is the richest diamond mine in the world, with an annual output of approximately 15.6 million carats. Mine richness takes into account the rate of diamond extraction combined with the quality of the diamonds that are mined (sale price per weight). To extract the diamonds, the facility produces 9.3 million tonnes of ore and an additional 37 million tonnes of waste rock per year.

41 *Diavik Diamond Mine — Canada*
64.496111°, -110.273333°

The Diavik Diamond Mine is located on the Lac de Gras lake in the Northwest Territories of Canada, 193 kilometers (120 miles) south of the Arctic Circle. The mine produces approximately 7.5 million carats of diamonds each year. In standard weight, that's an annual output of 1,500 kilograms (3,300 pounds).

42 *Porto Trombetas Bauxite Mine — Brazil*
-1.688161°, -56.489029°

The Porto Trombetas Mine opened in 1979 and has continued to expand and is now the largest bauxite mine in Brazil with an annual output of 18 million tonnes. Aluminum is the third most abundant element in the Earth's crust, but does not naturally occur as a metal. The first step in producing aluminum is mining its ore-bauxite. Then, aluminum manufacturing takes place in two phases: the Bayer Process to refine the bauxite ore in order to obtain aluminum oxide, and the Hall-Héroult Process to smelt the aluminum oxide in order to release pure aluminum.

43 *Chuquicamata Copper Mine — Chile*
–22.288964°, –68.896753°

Chuquicamata is the largest open-pit copper mine in the world. Located in the Antofagasta Region of Chile, the 850-meter-deep (2,790-foot) site has enabled the extraction of more than 29 million tonnes of copper. The major applications of copper are in electrical wires (approximately 60% of total use), roofing and plumbing (approximately 20%) and industrial machinery (approximately 15%). Copper is also combined with other elements to make alloys (approximately 5%) such as brass and bronze.

44 *Letlhakane Diamond Mine — Botswana*
–21.519691°, 25.654452°

The Letlhakane Diamond Mine is located roughly 190 kilometers (120 mi) west of the city of Francistown, Botswana. The open pit mine produces 3.6 million tons of ore and an additional 15 million tons per year of waste rock each year.

45 *Searles Lake — USA*
35.711209°, –117.361819°

Searles Lake is a 19-kilometer-long (12-mile), evaporated basin in the Mojave Desert of California, USA. The brine wells here tap into 4 billion tonnes of sodium and potassium mineral reserves in order to produce the essential ingredients for products such as detergents, cosmetics, and insecticides.

46 *Moab Potash Evaporation Ponds — USA*
38.485579°, –109.684611°

Evaporation ponds are visible at the potash mine in Moab, Utah, USA. The mine produces muriate of potash, a potassium-containing salt that is a major component in fertilizers. The salt is pumped to the surface from underground brines and dried in massive solar ponds that vibrantly extend across the landscape. As the water evaporates over the course of 300 days, the salts crystallize out. The variation of colors that are seen here occur because the water is dyed a deep blue, as darker water absorbs more sunlight and heat, thereby reducing the amount of time it takes for the water to evaporate and the potash to crystallize.

47 *Lake Urmia — Iran*
37.778092°, 45.326301°

Lake Urmia is a massive salt lake in Iran. In recent decades, the lake has shrunk to 10% of its former size due to the damming of the rivers that flow into it, as well as significant extraction of groundwater from the lake and its surrounding area. Currently the lake covers roughly 5,200 square kilometers and is the sixth largest saltwater lake in the world. In this Overview, the causeway and Urmia Lake Bridge, which divide the lake into its northern and southern portions, is visible.

48 *Mount Whaleback Iron Ore Mine — Australia*
–23.362130°, 119.669422°

The Mount Whaleback Iron Ore Mine is located in the Pilbara region of Western Australia. 98% of mined iron ore is used to make steel, and it is thus a major component in the construction of buildings, automobiles, and appliances such as refrigerators.

49 *Arlit Uranium Mine — Niger*
18.748570°, 7.308219°

The Arlit Uranium Mine is located in Arlit, Niger. French nuclear power generation, as well as the French nuclear weapons program, are both dependent on the uranium that is extracted from the mine — more than 3,400 tonnes per year.

URBANIZATION

50 *Paris, France*
48.865797°, 2.330882°

The street plan and distinctive appearance of central Paris, France is largely due to the vast public works program commissioned by Emperor Napoleon III and directed by Georges-Eugene Haussmann, between 1853 and 1870. Haussmann's renovation of Paris included the demolition of crowded and unhealthy medieval neighborhoods, and the building of broad, diagonal avenues, parks, squares, sewers, fountains, and aqueducts.

51 *London, England, UK*
51.507382°, –0.127811°

London, England is the capital and most populous city of Great Britain. Situated on the River Thames, London is the world's most-visited city as measured by international arrivals and is recognized for having a diverse range of peoples and cultures. More than 300 languages are spoken within the Greater London area.

52 *New Delhi, India*
28.613219°, 77.223931°

New Delhi, a district of Delhi, India, was planned by British architects Sir Edwin Lutyens and Sir Herbert Baker, and officially inaugurated in February 1931. Their design centered around two promenades — the Rajpath and Janpath — that run perpendicular to each other and intersect at the centre of this Overview.

53 *Amsterdam, Netherlands*
52.370987°, 4.891850°

The canal system of Amsterdam — known as "Grachten" — is the result of conscious urban planning. In the early seventeenth century, when immigration was at a peak, a comprehensive plan for the city's expansion was developed with four concentric half-circles of canals emerging at the main waterfront. In the centuries since, the canals have been used for defense, water management, and transport. They remain a hallmark of the city to this day.

54 *Manhattan, New York City, USA*
40.734026°, -74.002290°

Manhattan is the most densely populated borough of New York City in the United States. Home to roughly 1.6 million residents, the borough is often described as the cultural, financial, media, and entertainment capital of the world. In total, New York City has a population of roughly eight million people in its five boroughs. With Central Park located in the middle of Manhattan, the island is bound by the Hudson River to the west, Harlem River to the north, and the East River.

55 *Nice, France*
43.710195°, 7.261873°

Nice is the fifth most populated city in France with roughly one million inhabitants. Often considered the "capital" of the French Riviera, the city has one of the highest hotel capacities in the country as it's visited by more than four million tourists each year.

56 *Sun Lakes, Arizona, USA*
33.208518°, -111.876263°

Sun Lakes, Arizona, USA is a planned community with a population of approximately 14,000 residents, most of whom are senior citizens. According to US census data, only 0.1% of the community's 6,683 households are home to children under the age of 18.

57 *Dadaab Refugee Camp, Kenya*
-0.000434°, 40.364929°

Hagadera, seen here at right, is the largest section of the Dadaab Refugee Camp in Northern Kenya and is home to 100,000 refugees. And to cope with the growing number of displaced Somalis that arrived at Dadaab, the UN had to move people into a new area called the lfo extension, the gridded area seen here on the left. Dadaab is the largest refugee camp in the world with an estimated total population of 260,000.

58 *Palm Jumeirah, Dubai, United Arab Emirates*
25.119724°, 55.126751°

The Palm Jumeirah in Dubai, United Arab Emirates is an artificial island that was created with 3.3 billion cubic meters (4.3 billion cubic yards) of sand and 7 million tonnes of rock. It is estimated that the island is now home to approximately 26,000 people.

59 *Burning Man*
40.786981°, -119.204379°

Burning Man is a week-long, annual event held in the Black Rock Desert of Nevada, USA. Drawing more than 65,000 participants each year, the event is described as an experiment in community, art, self-expression, and radical self-reliance. One of Burning Man's key principles is "Leave No Trace" — meaning significant efforts are taken to make sure the desert returns to its original state in the days following the festival.

60 *La Plata, Argentina*
-34.921106°, -57.956633°

The planned city of La Plata — the capital city of the Province of Buenos Aires, Argentina — is characterized by its strict, square grid pattern. At the 1889 World's Fair in Paris, the new city was awarded two gold medals in the categories "City of the Future"'and "Better Performance Built".

61 *Sydney, Australia*
-33.890793°, 151.202736°

Sydney is state capital of New South Wales and the most populous city in Australia with more than five million residents. Situated on the Tasman Sea, the city is famous for the beaches — seventy in all — that line its coast.

62 *Valparaíso, Chile*
-33.029093°, -71.646348°

Valparaíso, Chile is built upon dozens of steep hillsides overlooking the Pacific Ocean. Known as "The Jewel of the Pacific", the city is the sixth largest in the country and is home to approximately 285,000 residents.

63 *Ansan, South Korea*
37.336147°, 126.718586°

Jeongwang-dong is an industrial sector in the city of Ansan, South Korea. The Korean government intensively drove a plan to develop the modern city, particularly in this area, with an emphasis on manufacturing. The striking blue color seen here results from the use of aluminum roofing, which is used for its low cost and longevity.

64 *Barcelona, Spain*
41.393648°, 2.160437°

The Eixample District in Barcelona, Spain is characterized by its strict grid pattern. This thoughtful and visionary design was the work of Ildefons Cerda (1815–1876). His plan features broad streets that widen at octagonal intersections to create greater visibility with increased sunlight, better ventilation, and more space for short-term parking.

65 *Kawasaki — Japan*
35.506377°, 139.719787°

Industrialized development is visible on the massive, artificial islands in Kawasaki, Japan. Located within the Kangawa Prefecture on Tokyo Bay, it is estimated that this area, primarily focused on industry, still contains roughly 1.5 million people. In total, the greater Tokyo area is estimated to have 38 million people - the largest urban area in the world.

66 *Ciudad Nezahualcóyotl, Mexico*
19.403572°, -99.013351°

Ciudad Nezahualcóyotl, a municipality of State of Mexico, is characterized by its long, straight, and gridded streets. With a population of more than 1 million people (the entirety of State of Mexico contains approximately 16 million residents), the area is home to many citizens who have migrated there from other parts of the country.

POWER

67 *Ivanpah Solar Electric Generating System — USA*
35.570004°, -115.472194°

The Ivanpah Solar Electric Generating System is a solar thermal power project in the California Mojave Desert, 64 kilometers southwest of Las Vegas, Nevada. It deploys 173,500 heliostats, each with two mirrors, focusing solar energy on boilers located on three centralized solar power towers. The receivers then generate steam to drive specially adapted turbines. With a construction cost of $2.2 billion and a gross capacity of 392 megawatts, Ivanpah is one of the largest plants of its kind in the world.

68 *Baytown Refinery — USA*
29.723307°, -95.132921°

Baytown Refinery in Baytown, Texas is the second largest oil refinery in the United States and one of the largest in the world. The facility has a production capacity of 584,000 barrels per day and covers nearly 10 kilometers.

69 *Middelgrunden — Denmark*
55.690455°, 12.668373°

Middelgrunden is an offshore wind farm located 3.5 kilometers (2.2 miles) from Copenhagen, Denmark in the Øresund — the strait that forms the border of Denmark and Sweden. The farm's 20 turbines deliver approximately 4% of the power for Copenhagen. When wind blows against the blades of a wind turbine, they slowly rotate. The blades are connected to a drive shaft on the top of the turbine that turns a generator, thereby generating electricity that is carried through underground cables to each site's substation. The turbines operate independently of one another, and each has an internal computer that constantly calculates wind speed and direction. The top of the turbine and its blades can rotate a full 360 degrees, and change the pitch of the blades to always face into the wind and optimize positioning for energy creation.

70 *Donghai Bridge Windfarm — China*
30.770004°, 121.991800°

With the incoming tide, streaks of sediment form around the turbines of the Donghai Bridge Wind Farm in Shanghai, China. The facility was the first commercial offshore wind farm in China, and has the capacity to power 200,000 homes.

71 *Three Gorges Dam — China*
30.822723°, 111.001181°

The Three Gorges Dam, located on the Yangtze River in China, is the largest hydro-electric power station in the world. At full operating power, Three Gorges reduces coal consumption by 31 million tonnes, avoiding 100 million tonnes of greenhouse gas emissions per year. However, the construction of the dam flooded numerous archeological and cultural sites, while displacing some 1.3 million people living along the river.

72 *Turkey Point Nuclear Generating Station — USA*
25.394189°, -80.346119°

The Turkey Point Nuclear Generating Station in Homestead, Florida, USA is surrounded by an extensive network of cooling canals. Water used to cool the nuclear reactors is sent on a two-day journey from the plant through the 270-kilometer (168-mile) canal system before it is circulated back for reuse. Because the water in the canals is extremely warm and salty, the area has become a preferred habitat and refuge for the North American crocodile.

73 *Ulsan Refinery — South Korea*
35.460962°, 129.353486°

The Ulsan Refinery in Ulsan, South Korea is the third largest oil refinery in the world. Crude oil is carried here by oil tankers from the Middle East, South America, and Africa. The facility has a refining capacity of 1,120,000 barrels per day and produces liquefied petroleum gas, gasoline, diesel, jet fuel, and asphalt.

74 *Cushing Crude Oil Storage — USA*
30.770004°, 121.991800°

The crude oil storage facilities in Cushing, Oklahoma, USA — approximately 85 million barrels — are the largest in the world and represent 13% of the total crude storage capacity in the United States. The town is strategically located at the intersection of numerous pipelines, including a vital terminus point of the Keystone Pipeline that runs south from the tar sands of Alberta, Canada. The town of Cushing, Oklahoma is home to only 2,000 residents.

75 *Fukushima Daiichi Nuclear Power Plant — Japan*
37.421405°, 141.030850°

On 11 March 2011, an earthquake with a magnitude of 9.0 — one of the most powerful earthquakes ever measured — struck off the northeast coast of Japan. The resulting tsunami wreaked massive damage across the country, including violent swells up to 14 meters (46 feet) that rose over the seawalls at the Fukushima Daiichi Nuclear Power Plant. Over the three weeks that followed the earthquake, explosions and partial nuclear meltdowns occurred in reactors 1, 2, and 3 (reactors 4, 5, and 6 were not operating when the quake struck). In an effort to contain the water that has been pumped in to cool the melted reactors, thousands of steel barrels have been constructed at the site to hold approximately 200 million gallons of the contaminated liquid. Yet in 2013, Japanese officials announced that the highly radioactive coolant was leaking into the Pacific Ocean at a rate of 300 tonnes per day — enough to fill an Olympic swimming pool in a week. The cost for the clean-up effort is estimated at $11 billion USD over the next 40 years.

76 *D.B. Wilson Coal-Fired Station — USA*
37.450255°, -87.084050°

The D.B. Wilson Station is located in Centertown, Kentucky, USA. Coal is the largest source of energy for the generation of electricity worldwide, as well as one of the largest human causes of carbon dioxide release. In 1999, world gross carbon dioxide emissions from coal usage were 8,666 million tonnes. By 2011, that figure had increased to 14,416 million tonnes.

77 *Gemasolar Thermosolar Plant — Spain*
37.560755°, -5.331908°

This Overview captures the Gemasolar Thermosolar Plant in Seville, Spain. The solar concentrator contains 2,650 heliostat mirrors that focus the sun's thermal energy to heat molten salt flowing through a 140-meter-tall (460-foot) central tower. The molten salt then circulates from the tower to a storage tank, where it is used to produce steam and generate electricity. In total, the facility displaces approximately 30,000 tonnes of carbon dioxide emissions every year.

78 *Lebrija 1 Solar Power Plant — Spain*
37.007977°, -6.049280°

The Lebrija 1 Solar Power Plant is a solar thermal power plant in Lebrija, Spain. Solar thermal plants use mirrors to concentrate solar energy and heat oil to a temperature around 400 degrees Celsius (752 degrees Fahrenheit). Once heated, the oil transfers its thermal energy to water, ultimately producing pressurized steam. This steam then drives a turbine, and converts mechanical energy into electricity through a generator. The facility in Lebrija is comprised of approximately 170,000 individual mirrors installed on 6,048 parabolic troughs. If placed next to one another, the troughs would extend for 60 kilometers (37 miles).

79 *Gujarat Solar Park — India*
23.905854°, 71.196795°

The Gujarat Solar Park is a collection of individual solar facilities in Gujarat, India. The project is estimated to prevent approximately 8 million tonnes of carbon dioxide from being released into the atmosphere and will save approximately 900,000 tonnes of natural gas per year. The primary components of this particular type of solar park are solar panels to absorb and convert sunlight into electricity, and a solar inverter that changes the electric current from direct current (DC) to alternating current (AC), the form that is transmitted through the power grid.

TRANSPORTATION / LOGISTICS

80 *Tucson Airplane Boneyard — USA*
32.151087°, -110.826079°

The largest aircraft storage and preservation facility in the world is located at Davis-Monthan Air Force Base in Tucson, Arizona, USA. The boneyard — run by the 309th Aerospace Maintenance and Regeneration Group — contains more than 4,400 retired American military and government aircrafts.

81 *Progreso Pier — Mexico*
21.323317°, -89.672746°

The pier in Progreso, Mexico is the longest in the world, stretching 6.5 kilometers (4 miles) into the Gulf of Mexico. Because the town's shore sits on a limestone shelf that drops off gradually as it gets further into the Gulf, the pier requires this vast length to allow cruise ships to dock here.

82 *Bailey Yard — USA*
41.151651°, -100.820341°

Bailey Yard, located in North Platte, Nebraska, USA, is the world's largest railroad classification yard. The yard is more than 13 kilometers in length and 3 kilometers wide, with 200 separate tracks totaling more than 500 kilometers of track. An average of 139 trains and over 14,000 railroad cars pass through Bailey Yard each day.

83 *Charles De Gaulle International Airport — France*
49.009725°, 2.545583°

Charles De Gaulle Airport is the largest and busiest airport in France, and the ninth busiest in the world, handling more than 65 million passengers each year. The facility has three terminals, including the recognizable, circular layout of Terminal 1 (seen here in the centre right). Designed by Paul Andreu in the image of an octopus, the building's centre houses key operations such as check-in and baggage claim, while its gates are located in seven satellite buildings connected via underground walkways.

84 *Port of Los Angeles — USA*
33.738478°, -118.257900°

The Port of Los Angeles is the busiest container port in the United States, but only the 16th-busiest in the world. Approximately $1.2 billion worth of cargo comes through the facility each day and more than 165 million metric revenue tons of cargo are moved here each year. The most-imported types of goods are furniture, automobile parts, apparel, electronic products, and footwear.

85 *Port of Singapore*
1.237656°, 103.806422°

Cargo ships and tankers — some weighing up to 300,000 tonnes — wait outside the entry to the Port of Singapore. The facility is the world's second-busiest port in terms of total tonnage, shipping a fifth of the world's cargo containers and half of the world's annual supply of crude oil.

86 *Øresund Bridge — Denmark / Sweden*
55.571592°, 12.843175°

Stretching nearly 5 miles, the Øresund Bridge is the longest combined road and rail bridge in Europe. The bridge, which then becomes a tunnel, joins together two metropolitan areas — the Danish capital city, Copenhagen, and the Swedish city of Malmö. The bridge itself has a mass of 82,000 tonnes and supports two railway tracks and four road lanes.

87 *Channel Tunnel Entrance — France*
50.917395°, 1.809391°

Car loading ramps and tracks are seen by the entrance to the Channel Tunnel in Coquelles, France — visible in the upper left of this Overview. The tunnel spans 50.5 kilometers (31.4 miles) and contains the longest undersea portion of any tunnel in the world at 37.9 kilometers (23.5 miles). Construction began in 1988, was completed in 1994, and cost approximately $8 billion USD.

88 *Kansai International Airport — Japan*
4.433168°, 135.239150°

Kansai International Airport is located on an artificial island in the middle of Osaka Bay, Japan. To form the island, a 30-meter (98-foot) layer of earth was created on top of the seafloor with 21 million cubic meters (27.5 million cubic yards) of land that was excavated from three separate mountains. As of 2008, the total cost of Kansai Airport was $20 billion USD, including land reclamation that has been necessary to prevent its continued sinkage (7.1 centimeters or 2.8 inches per year as of 2008) into the bay.

89 *Harry Pregerson Stack Interchange — USA*
33.928700°, -118.281000°

The Judge Harry Pregerson Interchange is a stack highway interchange located in Los Angeles, California, USA. The junction is composed of five levels that scale to a height of more than 40 meters (132 feet).

90 *Port of Jakarta — Indonesia*
-6.091939°, 106.864162°

Massive cargo ships and tankers — some weighing up to 300,000 tons — are anchored outside the Port of Tanjung Priok in Jakarta, Indonesia. The facility is the busiest and most advanced Indonesian seaport, handling more than 50% of Indonesia's trans-shipment cargo. The port is also among the least efficient in all Southeast Asia, due to slow customs handling and limited docking capacity.

91 *Dallas — Fort Worth Airport — USA*
32.897590°, -97.040413°

Dallas — Fort Worth International Airport stretches across 70 square kilometers (27 square miles) in Texas, USA. The facility is the tenth busiest airport in the world by passenger traffic, accommodating more than 64 million passengers each year.

92 *Nardo Ring — Italy*
40.327222°, 17.826111°

The Nard. Ring is a high-speed, 12.6-kilometer-long (7.8-mile) circular test track in Nardo, Italy. Each of the ring's four lanes has a determined "neutral speed" and is banked in such a manner that one can drive as if the road were straight.

93 *Marina Del Rey — USA*
33.797806°, -118.428213°

Marina del Rey, California is the world's largest man-made small craft harbor. With docking capacity for 5,300 boats, the port is also considered "home" to approximately 6,500 vessels.

94 *Hyundai Alabama Plant — USA*
32.290728°, -86.315135°

Cars are parked next to the Hyundai production facility in Montgomery, Alabama, USA. The plant has a capacity of 300,000 automobiles and also contains the production facility for their engines. In 2015, 17.5 million cars and light trucks were sold in the United States, raising the total number of registered vehicles in the country to roughly 253 million.

95 *Jiaozhou Bay Bridge — China*
36.171168°, 120.296816°

The Jiaozhou Bay Bridge is the world's longest bridge, spanning 41.58 kilometers (25.84 miles), to connect the Chinese cities of Qingdao and Huangdao. The construction used 450,000 tons of steel and 2.3 million cubic meters of concrete. The bridge is T-shaped with an over-water, semi-directional interchange to allow for a third directional exit/entry from Hongdao Island.

96 *Golden Gate Bridge — USA*
37.818672°, -122.478708°

The Golden Gate Bridge is a 2.7-kilometer-long (1.7-mile) suspension bridge in San Francisco, California, USA that spans the Golden Gate Strait — the channel between San Francisco Bay and the Pacific Ocean. The bridge's signature color, known as "international orange", was selected to complement its natural surroundings and enhance its visibility in fog.

After the End of the World

Please return this booklet
to its place

Courtesy of Benjamin Grant
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