BEIJING—China and the U.S. struck new climate, military, trade and visa agreements during a marathon two days of talks, as presidents Barack Obama and Xi Jinping made significant strides in improving an often-tense relationship.

In an unexpected move, the two leaders on Wednesday unveiled substantial new commitments to curb greenhouse gas emissions, with China agreeing for the first time to stop increases in carbon dioxide emissions by around 2030 or earlier, U.S. officials said.
Messrs. Xi and Obama also reached two new agreements designed to avert military confrontations in Asia, one on notifying each other of major activities, such as military exercises, and the other on rules of behavior for encounters at sea and in the air.

Shortly before the summit, the two sides completed deals to issue 10-year tourist and business visas and to drop tariffs on semiconductors and other information-technology products, which backers say could cover $1 trillion in trade.

“Our relations are now standing at a new historical point,” Mr. Xi said at their meeting on Wednesday, calling their cooperation a “new model” for relations. “I’m ready to work with you in this direction.”

“There are important differences that we have both practically as well as our vision for our respective countries and our conduct in foreign policy,” Mr. Obama said, but he added that they try to work together when they can.

The agreements are rare signs of progress on core issues in the rocky relationship. The U.S. is trying to consolidate influence in Asia, while Beijing is determined to make China the region’s pre-eminent military and economic power.

Relations have foundered over the past year on cyberspying, democracy demonstrations in the Chinese territory of Hong Kong and China’s rough-elbowed approach to territorial disputes with Japan and the Philippines, both U.S. allies.

Discord between Messrs. Xi and Obama was also apparent in the days leading up to their summit as they both championed rival free trade pacts at a gathering of Asia Pacific leaders in Beijing earlier this week. Differences on many core issues endure and the new agreements do not amount to a sea change in bilateral ties.

But both men appear eager to recalibrate a relationship that has largely failed to match the promise of their first summit 16 months ago at the Sunnylands estate in California, when they tried to establish a personal rapport with an informal shirt-sleeves meeting.

The Chinese leader said the two sides had agreed to speed talks on a new pact to open up investment between the two, known as the Bilateral Investment Treaty.

The two countries “will make efforts to reach agreement on the core issues and major articles of the treaty text,” Mr. Xi said, adding that they plan talks on some details next year.
In another unexpected move, Mr. Xi took questions at a news conference following the summit. U.S. officials had pushed for that, but Chinese officials had long resisted, favoring a more scripted joint appearance without questions.

To recapture some of the informal Sunnylands atmosphere, Mr. Xi led Mr. Obama on a walk Tuesday night through gardens at Zhongnanhai, the Communist Party’s leadership compound next to the Forbidden City in Beijing. The two wore suit jackets and overcoats but no ties.

Their discussions on Tuesday night were scheduled to finish in under three hours but lasted for four hours and 40 minutes, U.S. officials said.

The progress reflects Mr. Obama’s desire to strengthen relations with China as one of the three main planks of his legacy on Asia policy, aides say. He also aims to boost the U.S. military footprint in Asia and promote democracy in Myanmar, where he goes next.

For Mr. Xi, the agreements on matters of global importance help to further his goal of building what he has called a new type of major-power relationship with the U.S.—as equals. Beijing also fears that Mr. Obama’s successor could take a more hawkish stance on China, analysts say.

“They’re trying to put the relationship on a positive trajectory for the next couple of years,” said Jeff Bader, a former State Department and National Security Council official, now at the Brookings Institution.

The climate-change agreement should provide a “shot of momentum” for international negotiations on cutting greenhouse gas emissions that formally start next month, a senior administration official told reporters in a conference call. The two have been coordinating their carbon-emissions plans for months, senior U.S.
officials said in that call.

The U.S. said it would double its pace of carbon-dioxide reductions, eyeing an overall cut of greenhouse gases of between 26% and 28% by 2025 compared with 2005 levels.

China, which is still seeing quick industrial growth, set its sights lower, agreeing to stop its increases in carbon dioxide emissions by around 2030 or earlier, with fossil fuels falling to some 80% of Chinese energy use by then, U.S. officials said.

The military agreements reflected the surprising progress made on defense ties since the Sunnylands summit. The need for better military relations has been underscored by China’s efforts to enforce contested maritime claims across the South China and East China seas.

“It’s incredibly important that we avoid inadvertent escalation and that we don’t find ourselves again having an accidental circumstance lead into something that could precipitate a conflict,” said Ben Rhodes, a U.S. deputy national security adviser.

In his public statements on Wednesday, Mr. Obama said the two sides “have made important progress” in discussing China’s territorial disputes. “Even more progress is possible,” he said.

China’s defense ministry said the agreements would have “important effects and significance for promoting China-U.S. strategic trust and building a new type of military relationship.”

The agreements are part of a broader effort to encourage the Chinese military to
adopt international norms and to persuade other Asian nations to strike similar agreements, defense analysts said.

The notification mechanism covers policy and strategy developments, and observation of military exercises and activities, while the rules of behavior include details on encounters between naval surface vessels, according to a White House statement.

The U.S. would prioritize developing details on air-to-air encounters, and completing a mechanism to inform each other of ballistic missile launches, the statement said.

China has long opposed a military-encounters agreement with the U.S. on the grounds that it implied an adversarial relationship like that between the U.S. and the former Soviet Union.

That has changed in the last year as both sides have recognized that they can’t reconcile their interpretations of international law on maritime issues, but also can’t allow unintended military encounters to derail their overall relationship.

“We need a third way between our disagreements,” said Peter Dutton, director of the China Maritime Studies Institute at the U.S. Naval War College. “The U.S.-China relationship at sea is too important to leave encounters to chance.”

China, the U.S. and 19 other countries with navies that operate in the Western Pacific agreed in April to establish the region’s first code of conduct for unplanned encounters between military ships and aircraft in international waters.

But China hasn’t always observed that in areas that it sees as territorial waters and that the U.S. regards as international waters. In August, the Pentagon accused Chinese jet fighters of flying dangerously close to U.S. surveillance aircraft over the South China Sea.

In recent meetings, Chinese military commanders have privately assured U.S. officials that such close encounters shouldn’t happen again, according to the people familiar with the discussions.

At the Beijing meetings this week, Mr. Xi took another important step to reduce tensions in the region, agreeing to meet with Japanese Prime Minister Shinzo Abe after two years of tense confrontation over islands in the East China Sea.

Mr. Obama’s approach to Beijing in his final two years in office is mainly to find areas where they can try to make advances.
The Information Technology Agreement, which could be ratified in December by members of the World Trade Organization, covers trade in semiconductors, medical devices, Global Positioning System devices and other products, U.S. Trade Representative Michael Froman said.

—Bob Davis and Yang Jie in Beijing contributed to this article.

Write to Carol E. Lee at carol.lee@wsj.com, Jeremy Page at jeremy.page@wsj.com and William Mauldin at william.mauldin@wsj.com